

CHAPTER 9

GIS MAPPING TOOL TO SUPPORT WATER RESOURCE PROTECTION

9.A. INTRODUCTION TO THE GIS MAPPING TOOL

The objective of the GIS Mapping Tool is to help protect water resources in Santa Clara County by making water resource related information available to local land use agencies, developers, private property owners, and the general public. The GIS Mapping Tool is now available for all parcels throughout the County and offers the following functions:

- Provides a “Trigger” to identify streamside properties and related water resource protection issues.
- Facilitates the review of streamside properties by providing a direct link from the visual parcel information to the Guidelines and Standards.
- Provides disclosure to the public/business community regarding streamside issues.

It is anticipated that during the Sept. 2005 - Feb. 2007 period, the GIS Mapping Tool website will be expanded to include links to educational materials and permit-related documents associated with the application of the Proposed Guidelines and Standards for Land Use Near Streams.

WHO CAN BENEFIT FROM THE GIS MAPPING TOOL

The Mapping Tool is a particularly valuable resource to local jurisdiction staff as it will help flag potential issues for staff to take into consideration in reviewing permit applications. The Mapping Tool is also intended to provide detailed information early on in the permitting process to the development community as to which Guidelines and Standards may be required for a specific project. Finally, the Mapping Tool is also intended to provide private property owners and streamside residents with water resource information pertaining to their specific property.

HOW TO ACCESS THE GIS MAPPING TOOL

Accessing the Mapping Tool is easy! Just go to the following website:

<http://arcview.valleywater.org/WRPC>

When prompted for the User Name and Password information, just type in “WRPC” in both cases. If you have any problems accessing the website, please call (408) 265-2607, ext. 2576.

To access the Mapping Tool:
<http://arcview.valleywater.org/WRPC>

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9.B. INSTRUCTIONS ON HOW TO USE THE MAPPING TOOL

The following set of instructions is intended to provide guidance as you start using the GIS Mapping Tool. The instructions include a pictorial representation of default screen you will find when you first log in along with the names of the different visual elements on the screen. The instructions also include a brief description of the different functions available in the toolbar as well as information on related to Layer Visibility and making a Layer Active. If you have any questions on how to use these instructions, please call the Santa Clara Valley Water District at (408) 265-2607, ext. 2576

Logging In

To connect to the SCVWD GIS Mapping Tool, go to <http://arcviv.valleywater.org/WRPC/index.html>. Login using the following:

- **Username: WRPC**
- **Password: WRPC**

Mapping Tool Components

The location of the four components described below are indicated on the map above with the numbers 1-4 highlighted in red.

- 1. Map Window:** Displays the map image, which will include information on any active layers.
- 2. Layer List/Legend:** Displays either a list of layers or a Map Legend for the layers. Toggle using the "Layers/Legend" tool button to switch between the two.
- 3. Toolbar:** Displays currently selected tool and tool buttons for manipulating the map and performing queries, printing, etc.
- 4. Overview Map Window:** Displays a county scale map showing extent of current map view

Helpful Hints

- Many layers are scale-dependent, which means that you must zoom in or zoom out for them to become visible.
- Many functions work only on the active layer. To make a layer active, use the button to switch to the Layer List, then click the Active radio button next to the layer that you want to make active.
- There can only be one active layer up at one time.
- Most GIS layers do not overlay/register on the orthophotos accurately. GIS layers are for illustration and general analysis purposes only and are not accurate to surveying or engineering standards. Information is not guaranteed to be accurate, current or complete.

List of Buttons on Toolbar



- Use this to switch between viewing the Legend and the Layer List.



- Either click once on the map or drag a box to define the zoom extent.



- Same as the Zoom in tool, but zooms out.



- Zoom to the full extent of the Map Service, typically the entire County.



- Will zoom in (or out) to fit the current active layer.

Please note: The desired layer must be active in order to zoom to it.

 Previous Extent

- Will send you back to the previous map scale.

 Pan

- Click & drag cursor to pan the map.

 Identify

- Point & click on a feature on the map. The attributes of all layers at the location you clicked will be identified and reported.

Please note: The desired layer must be active in order to query it.

 Select Rectangle

- Drag a box around the features of a layer from which you would like to view attributes. The features of the layer inside the rectangle will be highlighted and attributes displayed. The target layer must be active in order to select it.

 Select Line/Polygon

- Choose to select features of a layer by line or polygon. The features of the layer intersecting the line or inside the polygon will be highlighted and reported. NOTE: The desired layer must be active in order to select it.

 Clear Selection

- Clear selected features from the map.

 Print

- Type in your desired map title, and click on "Create Print Page."

 Parcel Search

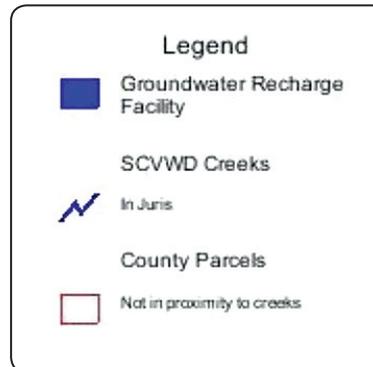
- Retrieve information about a parcel, and access Guidelines & Standards documents.

 Metadata

- View Metadata for the active layer. Download both Metadata and GIS datasets.

Layer Symbology

To see how layers are symbolized, use the Layers/Legend button to switch to the Legend.



Layer Visibility

To make a layer visible, use the Layers/Legend button to switch to the Layer List.

In the Layer List, put a check mark in the box next to the layer that you want to make visible. In this example, the GroundWater Recharge Facility, SCVWD Creeks, and County Parcels layers will be visible, but the remaining layers will not be visible.



GIS MAPPING TOOL

The Active Layer

Many functions (Zoom to Active Layer, Identify, Query, Search, Parcel Search, Metadata, Select by Rectangle, Select by Line or Polygon) only work on the Active Layer.

Making a Layer Active

To make a layer active, select the radio button next to the layer name. In the example above, the County Parcels layer will be the active layer.

Please note: There can only be one layer Active at any time.

Application Workflow

The typical workflow with this application involves the following steps:

1. Make a layer both active and visible
2. Select a tool to apply to the active layer
3. Click the mouse at a point of interest on the map for tools like "Identify"
4. Click and Drag the mouse to "Pan" or "Zoom"
5. Input information you are prompted for if the tool opens a new window

9.C. NEXT STEPS FOR WEBSITE DEVELOPMENT

As the Water Resource Protection Collaborative starts a new phase of work from September 2005 to February 2007, it is anticipated that the User's Manual for Guidelines and Standards for Land Use Near Streams, as well as the GIS Mapping Tool and related information may be available electronically at a Collaborative website, where information can be more readily available to a wide audience.

GIS Mapping Tool Help:
<http://arcview.valleywater.org/WRPC/Help/index.html>

CHAPTER 2 REFERENCES

Dunne T and LB Leopold. 1978.
Water in environmental planning.
W.H. Freeman and Co. New York, New York.

Harrelson CC, CL Rawlins, and JP Potyondy.
1994.

Stream channel reference sites:

An illustrated guide to field technique. Rocky
Mountain Research Station, USDA Forest
Service. RM-245.

Hedman ER. 1970. Mean annual runoff as
related to channel geometry of selected
streams in California. USGS Water-Supply
Paper 1999-E in cooperation with the CA
Dept of Water Resources.

Hedman ER and WR Osterkamp. 1982.
Streamflow characteristics related to channel
geometry of streams in western United
States. USGS Water-Supply Paper 2193.

Leopold LB. 1994. A view of the river.
Harvard University Press. Cambridge, MA.

Pleus AE and D Schuett-Hames. 1998. TFW
Monitoring program method manual for
the reference point survey. Prepared for the
Washington State Dept of Natural Resources
under the Timber, Fish, and Wildlife
Agreement. TFW-AM9-98-002.

Rosgen DL. 1994. A classification of natural
rivers. *Catena*. 22:169-199.

Stream Notes. 1998. Would the real
bankfull please stand up!. Stream Systems
Technology Center, USDA Forest Service.

VT ANR. 2004. Vermont stream geomorphic
assessment: Appendix K, identification of
bankfull stage. Vermont Agency of Natural
Resources.

Wahl KL. 1977. Accuracy of channel
measurements and the implications in
estimating streamflow characteristics. USGS
– *Jour of Research*. 5(6):811-814.

CHAPTER 5 REFERENCES

Adopt-A Creek Program brochure

2004 National River Cleanup Day site map

2003 Stewardship for Small Acreages flyer

Streamcare Guide for Santa Clara County

2003 Creek Care mailer

Why do people dump trash
in creeks? brochure

Working Around Watercourse brochure

Stewardship Course for Forest
Landowners article

Water-Wise House Call program brochure

Urban Creeks Council's Stream
Management Program for Private
Landowners in Contra Costa
County brochure

California Forest Stewardship
Program description

Melbourne Water Stream Frontage
Management Program description

City of Oakland Clean Creek
program web page

Arlington, Texas Creek Care web page

GLOSSARY OF TERMS

WORD	DEFINITION	SOURCE
Active Channel	The channel that contains the discharge where channel maintenance is most effective, sediment are actively transported and deposited, and that are capable of containing most flows. Active channels are located within the area bounded by bankfull stages.	Leopold
Active Flood plain	Low lying areas built by watercourse sediment depositions between top of bank that are adjacent to a watercourse and that have been constructed by the present river in the present climate. These areas are susceptible to frequent inundation during moderate and higher flows when the active channel’s capacity is exceeded. Active floodplains are most prominent along low-gradient, meandering reaches and are often absent or undistinguishable along steeper sloped stream channels.	Collaborative, Leopold
Active Recreation	Includes sports fields, recreation centers, tot lots, play equipment, multi-use courts, etc. Should not be located within riparian area.	San Jose Riparian Corridor Policy

GLOSSARY OF TERMS

WORD	DEFINITION	SOURCE
<p>Bankfull stage</p>	<p>Bankfull stage is the point at which the flow just begins to enter the active floodplain. Accurate measurements have been conducted on gaged streams, however, in absence of historical hydrological records there are a number of field indicators that can be used to identify bankfull stages with a great deal of accuracy:</p> <ul style="list-style-type: none"> • An abrupt change in the slope of the stream channel, usually from a vertical plane to a horizontal plane on top of the floodplain. • The bankfull stage is usually marked by a change in vegetation such as the change from gravel bars to forbs, herbs, or grasses. Persistent woody vegetation is usually indicative of upland terrain, but can be misleading. • Erosion or scour features. These features indicate areas just below the bankfull stage and are recognized as significant characteristics of stream dynamics. • Flat depositional benches, lateral bars, or point bars, usually created by lateral or downward movement of streams and can create active floodplain areas. • Change in the size distribution of sediment materials at the surface from fine gravel to cobbles, from sand to gravel or even fine gravel material. It can change from fine to coarse or coarse to fine. • Stain lines can indicate frequent inundation of water on rocks. Stain lines may be marked by sediment or lichens. 	<p>Water Resources Protection Collaborative, Leopold</p>
<p>Base Flood Elevation (BFE)</p>	<p>The base flood elevation is the height of the base flood in relation to a vertical datum. The base flood is a 100-year flood event, which has a one percent or greater chance of occurrence in any given year.</p>	<p>Collaborative</p>

WORD	DEFINITION	SOURCE
Development	Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.	California Floodplain Management Ordinance
Geomorphology (Fluvial)	The study of the natural relationship between a stream and its bank and bed. Forced into an unnatural position, the streambanks and bed will erode. Shaped to match the water flow, the stream remains more stable.	
Habitat	The specific area or environment in which a particular type of plant or animal lives. To be complete, an organism's habitat must provide all of the basic requirements of life for that organism.	SCVWD
Hydrology	<p>1. The branch of physical geography concerned with the behavior of water in the atmosphere, on the surface of the earth and underground.</p> <p>2. The science dealing with the properties, distribution and circulation of water</p>	USDA NRCS Pullman Plant Materials Center, Pullman, WA and The Habitat Restoration Group of Felton, CA
Infill	The development of the last remaining lots in an existing developed area, the new development within an area already served by existing infrastructure and service, or the reuse of already developed, but vacant properties.	Land-Use Lingo: A Glossary of Land-Use Terms by T. A. Holveck, 2001.
Outside Edge of Riparian Habitat	The riparian edge is the outer boundary of the existing riparian vegetation; for trees, the dripline is the outer boundary.	

GLOSSARY OF TERMS

WORD	DEFINITION	SOURCE
Redevelopment	Development activity generally characterized by the clearance of existing structures and new construction. The new development may be the same type of land use, or a new type.	Fairfax County.
Restoration	The reestablishment of the structure and function of ecosystems. Ecological restoration is the process of returning an ecosystem as closely as possible to predisturbance conditions and functions. Implicit in this definition is that ecosystems are naturally dynamic. It is therefore not possible to recreate a system exactly. The restoration process reestablishes the general structure, function, and dynamic but self-sustaining behavior of the ecosystem.	SCVWD
Riparian	<p>1. On, or pertaining to, the banks of a stream. (As in riparian vegetation or riparian woodland.)</p> <p>2. Pertaining to the banks and other adjacent, terrestrial (as opposed to aquatic) environs of freshwater bodies, watercourses, and surface-emergent aquifers (e.g., springs, seeps, oases), whose imported waters provide soil moisture significantly in excess of that otherwise available through local precipitation - soil moisture to potentially support a mesic vegetation distinguishable from that of the adjacent more xeric upland.</p>	Warner and Hendrix. Riparian Resources of the Central Valley and California Desert 1985. California Department of Fish and Game.
Riparian Buffer	Land next to a stream or river that is vegetated, usually with trees and shrubs, that serves as a protective filter for streams. A buffer helps to stabilize stream banks from washing away and to reduce the impact of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals. In addition, a buffer helps supply food, cover, and thermal protection to fish and other wildlife. Riparian buffers can be 300 feet wide or 20 feet wide; it depends on the stream and the land around the stream.	

WORD	DEFINITION	SOURCE
Riparian Vegetation	<p>1. Vegetation which occurs in and/or adjacent to a watercourse. For the purpose of administering Fish and Game Code Section 1600, et seq., this should be expanded to include vegetation adjacent to lakes as well.</p> <p>2. Vegetation growing on or near the banks of a stream or other body of water on soils that exhibit some wetness characteristics during some portion of the growing season.</p> <p>3. Vegetation which occurs along watercourses, and is structurally or floristically distinct from nearby, non-streamside vegetation.</p> <p>4. Riparian vegetation is terrestrial vegetation that grows beside rivers, streams, and other freshwater bodies and that depends on these water sources for soil moisture greater than would otherwise be available from local precipitation.</p>	<p>Warner, RE. and Hendrix, KM., eds. 1984. California Riparian Systems, Ecology, Conservation, and Productive Management. California Riparian Systems Conference, U.C. Davis. Sept 1981. University of California Press. Berkeley, CA</p>
Stream/Channel/Creek	<p>A stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks. This may include watercourses having a surface or subsurface flow that supports or has supported riparian vegetation, fish and/or aquatic life. (See appendix for a more detailed description.)</p>	<p>Collaborative</p>
Stream bed	<p>The substrate plane bounded by the stream banks over which water moves. Also called stream bottom. It is the area kept mostly or completely bare of vegetation by the wash of water of the stream.</p>	<p>King County Dept of Public Works 1993</p>
Stream bank	<p>The portion of the channel cross section that restricts lateral movement of water. A distinct break in slope from the channel bottom.</p>	<p>King County Dept of Public Works</p>

GLOSSARY OF TERMS

WORD	DEFINITION	SOURCE
Toe of Bank	The break in slope at the foot of a streambank where the bank meets the bed. (See section 2.G on page 2.15).	Collaborative
Top of Bank	Top of bank designates a stream channel boundary where a majority of normal discharges and channel forming activities takes place. The top of bank boundary will contain the active stream channel, active floodplain, and their associated banks. Top of bank of streams with levees will be delineated on the inner edge of the levee. Where there are no distinguishable features to locate top of bank, the local permitting agency or the Santa Clara Valley Water District will make a determination and document, as appropriate. In the absence of this determination, the 100-year water surface will be used. (See section 2.G on page 2.15).	Collaborative
Watercourses within SCVWD Jurisdiction	Those watercourses whose watershed area upstream is in excess of 320 acres as shown in the SCVWD's Watershed Map. These are also mapped on SCVWD GIS map.	

FREQUENTLY ASKED QUESTIONS

1. WHAT IS THE ANTICIPATED BENEFIT/IMPACT ON PROPERTY OWNERS AND THE BROADER COMMUNITY? POSITIVE? NEGATIVE?

The Proposed Guidelines and Standards for Land Use Near Streams (Proposed Guidelines and Standards) are designed to provide clear, consistent guidance to property owners and developers about how to design and construct development projects on streamside parcels. The goal is to help protect Santa Clara County streams and streamside resources.

By achieving this goal, both property owners and local communities will benefit from healthier streams and riparian resources, reduced erosion, more safety for streamside residents and structures, improved flood protection and water quality, and increased property values if trees and streamside amenities are left intact or enhanced.

2. WHEN WILL A PIECE OF PROPERTY/PROJECT BE AFFECTED?

The Proposed Guidelines and Standards apply to land use activities (i.e. building, construction, grading, landscaping subject to development review) associated with new development and redevelopment on parcels adjacent to streams. The Proposed Guidelines and Standards also include some proposed requirements and recommendations for remodels and additions to existing streamside homes that are designed to help protect both the structures themselves as well as stream side resources.

3. WILL THERE BE NEW OR ADDITIONAL REQUIREMENTS FOR STREAMSIDE PROPERTIES?

Yes, there will be some new permit application requirements as well as design and construction requirements.

In terms of the permit application, the applicant will be asked to:

1. Provide information about the size and type of stream on the parcel and describe the types of land use activities proposed in relation to the location of the stream;
2. Describe in the site plan certain existing conditions on site (i.e. bank erosion and flooding) and/or potential streamside impacts related to the development and construction (i.e. removal of riparian vegetation, grading, and drainage over the streambank);
3. Demonstrate how these types of concerns and conditions will be addressed.

In terms of the design and construction requirements, many overlap with or compliment existing stormwater and environmental regulations. They fall into several categories including: protection of riparian habitat, slope stability protection, erosion repair, grading, drainage, outfalls and trail construction. For example, a slope stability protection area varying between 10 to 25 feet, or as otherwise demonstrated by a geotechnical analysis, will need to be maintained to protect people and structures on the site.

DESIGN GUIDES FOR GUIDELINES AND STANDARDS

APPENDIX A

4. DO ALL STREAMSIDE LAND USES HAVE NEW REQUIREMENTS?

No, provisions have been made for exempting many types of land use activities from any streamside permit review. Exemptions include:

- a. Less than 3 cubic yards of earthwork
- b. Interior building construction and alterations
- c. Erection of storage buildings not greater than 120 sq. ft.
- d. Replacement of sewer or water laterals
- e. Re-roofing
- f. Wood fences six feet and height or less, or
- g. Exterior decks less or equal to 30" above grade

In addition, some communities may elect to exempt existing single-family homes on lots 10,000 square feet or less in size. The exact lot size subject to exemption may vary from community to community.

5. HOW IS IT DIFFERENT THAN EARLIER PROCESSES?

Currently, all proposed activities within 50 feet from a District jurisdictional stream are subject to permit review by the Santa Clara Valley Water District (SCVWD). Many communities, including San Jose, with its Riparian Corridor Protection Policy, and West Valley hillside communities, already regulate much of what is contained in the Proposed Guidelines and Standards. The goal has been to establish County-wide a clear, consistent set of Proposed Guidelines and Standards that enables property owners and developers to know ahead of time what information is required and what types of practices are required/recommended.

From a permitting perspective, the main differences will be that some cities and the County will elect to assume permit authority for streamside activities. This will streamline the permitting process for property owners because you will not need to get a separate permit from SCVWD unless the activity is on or next to SCVWD right-of-way. In addition, the Proposed Guidelines and Standards may be applied to smaller streams typically upstream of the historical SCVWD jurisdiction.

6. HOW DOES THE NEW PERMITTING PROCESS WORK?

Under the new approach, when a property owner files a permit application, the permit agency will screen by assessor parcel number to determine if the proposed land use activity is within a streamside parcel. This is called the 'Streamside Review Area'. If a parcel falls within the Streamside Review Area, then the permitting agency will review the permit application using the Proposed Guidelines and Standards to determine how stream resources can be protected.

7. WILL IT LENGTHEN THE DEVELOPMENT/PERMIT REVIEW PROCESS?

One of the primary objectives has been to provide clarity, certainty and predictability in the related permit review requirements. The goal is to decrease the review time by streamlining the permitting process. In addition to the Proposed Guidelines and Standards are a set of Permitting Tools, such as the "Streamside Resource Protection Questions". These tools outline what information required and how that information will be used in reviewing the permit application.

8. WILL THE PROPOSED GUIDELINES AND STANDARDS MAKE GETTING A PERMIT MORE EXPENSIVE?

Large developments presently have to adhere to Regional Water Quality Board requirements for stormwater runoff and related water quality protections, so no additional costs will be incurred in most instances to protect the water quality in streams. There will be some additional nominal cost if a consultant is needed to help complete permit applications for large projects. There may be some cost if a geotechnical analysis needs to be done to assure stability of a steep streamside slope or if a large site requires an assessment of biotic resources, but in some cases, these assessments are already required.

9. WHEN WILL THE PROPOSED GUIDELINES AND STANDARDS GO INTO EFFECT?

The SCVWD is starting to revise its Ordinance regulating permit requirements to incorporate the Proposed Guidelines and Standards. It is anticipated that the SCVWD will continue to permit these activities through February 2007 in most cases. At that time, many cities and/or the County will elect to assume the permit authority, and will incorporate provisions in their regulations to address the Proposed Guidelines and Standards.

10. WHAT KIND OF ASSISTANCE CAN I GET?

In some cases, technical assistance may be needed to accurately assess conditions such as the stability of a streambank or the value of streamside resources, similar to requirements contained in the San Jose Riparian Corridor Policy. For more information, contact your local Planning Department or the Community Projects Review Unit at the SCVWD at (408) 265-2607 x 2650.

I. RIPARIAN CORRIDOR PROTECTION

Introduction: An adequate riparian corridor is essential to protect water quality, fish/aquatic life and other biological values, bank stability and other designated beneficial uses. Guidelines and standards related to planting and removal of plants in this section are applicable in conjunction with a development proposal where city/county reviews landscaping plans. Additional efforts to guide the protection of the riparian corridor through the types of plants installed or removed will occur through outreach and educational methods. Guidance for single family additions and remodels is to make site development's relation to the creek in a better condition than existing through such measures as: redirection of drainage to the street, planting of native vegetation, creating a native buffer along the creek edge, increase the setback from the creek, providing erosion protection measures or repair, removing invasive species.

I.A.1 Protection of the Riparian Zone

Enforce existing City/County/SCVWD general plans, policies, or ordinances related to riparian areas, water quality and source water protection.

I.A.2 Protection of the Riparian Zone

City, County and SCVWD to develop criteria to determine allowable uses within riparian corridor and develop measures to protect existing riparian areas. This may require an assessment of onsite biotic and riparian conditions by a qualified expert and consultation with the appropriate resource and regulatory agencies.

I.A.3 Protection of the Riparian Zone

Riparian corridor buffers should be adopted by jurisdictions, as appropriate, consistent with onsite biotic conditions which may be determined a qualified professional to protect existing riparian habitat. Areas adjacent to streams should be considered for future restoration opportunities. Sensitive habitat areas should be identified and assigned appropriate buffers.

I.A.4 Environmental and water quality related to Structures Built Near Streams

Supplement CEQA guidance and checklist to include environmental impacts relative to temperature and water quality for aquatic life.

I.B. Native Plant Removal

Native riparian vegetation is not allowed to be removed (see Design Guide for list of native species).

EXCEPTION: Native riparian vegetation may be removed if there is a threat to public health and safety including an imminent danger of induced flooding. In addition, riparian vegetation may be removed if it will improve the stream ecology or habitat (a biologist/arborist must concur, as required by the permitting agency and recommend referral to SCVWD). If vegetation is proposed for removal in conjunction with a development project, mitigation will be provided as defined through the CEQA process and as agreed to by the local agencies and appropriate regulatory agencies.

I.C. Planting

Non-native species are not allowed to be planted between top of banks, or within an existing riparian corridor. Non-native invasive species are not allowed to be planted adjacent to an existing riparian corridor. Recommend watershed specific natives for major development restoration landscaping. Refer to California Native Plant Society "Guidelines for Landscaping to Protect Vegetation from Genetic Degradation". (www.cnps.org/archives/landscaping.pdf)

EXCEPTION: May be allowed if approved by SCVWD and appropriate state and federal regulatory agencies.

DESIGN GUIDES FOR GUIDELINES AND STANDARDS

APPENDIX B

I.C2. Planting

Do not plant invasive species. (see Design Guide for list of invasive species). For single family units, outreach and education materials will be employed to promote use of native plants. Discourage use of listed invasive species and encourage removal of invasive species by providing guidance on invasive species removal techniques. Refer to California Invasive Plant Council plant lists.

I.C3. Planting

Planting appropriate vegetation between top of banks is encouraged as an alternative to hardscape bank protection in locations where flood capacity is sufficient, in order to promote bank stability, improve habitat, and provide other water quality benefits. However, planting efforts should not reduce channel capacity significantly below design flows. This would be regulated as an encroachment between top of banks and assume mature vegetation.

EXCEPTION: See Activity—Encroachment between top of banks.

I.C4. Planting

No trees may be planted on a levee unless additional fill is placed against the levee. See Design Guide for example drawing.

I.C5. Planting

Trees must not be planted within easement or right-of-way of SCVWD water supply pipelines or the minimum required by other jurisdictions, as appropriate.

I.D. Irrigation

Irrigation runoff must not be allowed to cause erosion. If within outboard levee slope, irrigation must be bubbler or drip-type systems, and must be used for establishment purposes only. No main lines may be installed in levees.

I.D2. Irrigation and Planting

Follow efficient water use landscape ordinance requirements for drought tolerant plants and water conservation. Include measures to address stream side planting guidance.

I.E. Pesticide and Herbicide Use

Use of pesticides and delineation of responsibility for maintenance on District property or easements shall be conducted as defined by current practice. Outreach and educational materials will be employed to provide guidance on appropriate pesticide and herbicides for use near aquatic resources as per the District's Integrated Pest Management plan and its presentation of the use of alternatives to pesticides/herbicides when possible.

I.F. Post-Construction Water Quality

Post construction water quality mitigation measures are to be included in the proposed development conditions (see Construction-related Permit Conditions for Streamside Resource Protection in Guidelines and Standards User's Manual).

I.G. Land Uses Next to Riparian Corridors/Streams:

Avoid locating loading docks, trash enclosures, chemical storage areas and stationary noise producing mechanical equipment adjacent next to streams and riparian corridors. These facilities are not allowed in streams.

Refrain from locating new paved areas, active recreational areas, agricultural growing areas and grazing activities within riparian corridors. Refer to Standard Development Requirements for Golf Courses prepared by Santa Clara County for golf courses or large turf areas. Refer to the Start as the Source (www.scvurppp_w2k.com/basmaa_satm.htm) and SCVWD's "Streamside Planning" guide for street layout next to streams.

I.H. Light

Avoid bright colors and glossy or glare producing building finishes on structures facing the stream or riparian areas. Avoid nighttime lighting in riparian corridors, direct lighting away from riparian corridor and maximize distance of lighting from riparian corridor.

I.I. Monitoring

For projects subject to mitigation/monitoring requirements, riparian plantings for mitigation and bank repair/protection projects will be monitored to ensure successful establishment.

I.J. Protection of Fish and Aquatic Life

Preserve in and near-stream riparian vegetation whose canopies provide shade and nutrients for aquatic life.

I.J2. Protection of Fish and Aquatic Life

Protect/maintain stream characteristics suitable for fish habitat, including riffles, pools, gravel beds, stable undercut banks, overhanging vegetation & in-stream woody debris.

II. BANK STABILITY/STREAMBED CONDITIONS**A. Slope Stability Requirements for New and Major Redevelopment**

Introduction: Slope stability protection area for watercourses will be determined based on geomorphic and hydrologic conditions, the bank's physical characteristics, such as composition and height, the potential for instability or erosion, other environmental considerations, structure loading and flood potential as determined by the applicant's engineer. In addition, construction activities proposed below the top of bank and/or in the riparian corridor are subject to review and permit authorization from the Regional Water Quality Control Board, California Department of Fish and Game (DFG), and in most cases, the US Army Corps of Engineers and their Federal consulting agencies.

The slope stability protection area or trigger is designed to assist permitting staff in identifying those situations in which a proposed structure may threaten bank stability and/or bank instability may threaten the integrity of a structure and the health and safety of its occupants. If a property owner is proposing development/construction within the trigger area, the permitting agency should require further study of soil and slope stability in order to determine whether or not the location of a proposed structure may threaten bank stability and/or bank instability may threaten structures. For banks of larger streams, or for streams that are deeply incised or have highly erodible banks, a permitting agency may need to increase the protection area or trigger area in order to protect water quality and other resources.

II.A. Bank Stability for Structures Built Near Streams

Establish a bank stability protection area or trigger that applies to construction of new roads, parking lots, pools, and structures subject to the UBC. The bank stability protection area or trigger should be measured from top of bank and should be based upon stream characteristics including protection of existing riparian vegetation, natural or modified stream banks, and condition of bank.

For all new development and major redevelopment, the slope stability trigger will be set to be the greater of:

- 1) 2 to 1 structural slope stability protection area or trigger (This is measured using a hypothetical 2 horizontal to 1 vertical line projected from the toe of bank to a point where it intersects the adjacent ground.) This protection area or trigger would allow for biotechnical methods for slope repair should erosion occur. See Design Guide for explanatory drawing. The protection area should allow for construction access and access around the structure. There may be circumstances where the bank or

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channel instability requires a greater no construction area. In these cases, 2:1 may be inadequate to offer protection and to provide room for erosion repair, or;

- 2) 20 feet from top of bank or property line, whichever is greater

Where the property line falls within the stream, the definition of top of bank will be adopted by municipalities and used to determine protection area or triggers outlined in municipal codes.

For information on the proposed triggers for Single Family Units (SFU's), please refer to slope stability measures packages (Attachment).

For construction proposed within the protection area or trigger area, the applicant would need to conduct a stability analysis by stream type and demonstrate that the development would not require the introduction of hardscape in order to maintain active floodplain or active channel slope. Applicant would also be required to show how maintenance or repair of the stream could be provided. Stability based on stream types described below:

- **EARTHEN BANK STREAM**—geotechnical analysis must be provided considering static soil characteristics, stream dynamics, tractive forces on the slope, and the geomorphic functions of the stream. The improvement must be designed such that it will be supported in the event of bank failure.
- **HARDENED BANK or LINED STREAM**—load analysis must be provided to assure no impacts to the stability of the stream lining.

Other exceptions, such as fences > 6' high, meeting prescribed design criteria and location relative to stream bank to be developed and included in the Design Guide

II.A.2 Bank Stability for Structures Built Near Streams

Supplement CEQA guidance and checklist to include stream stability impacts from and to proposed development project.

II.B. Flood Protection for Structures Built Near Streams

Structures will meet FEMA requirements if within a special flood hazard area. Refer to SCVWD Watershed Stewardship Plans and verify with SCVWD the status of any planned or anticipated flood protection projects and their right of way requirements. SCVWD may request dedication of land rights for flood protection or maintenance access in conjunction with new or redevelopment projects.

For levee sections, recommend 18 to 25 foot building setback from toe of levee See descriptive drawing in Design Guide

EXCEPTION: Exceptions are allowed as consistent with City or County flood hazard ordinances.

III. BANK STABILITY/STREAMBED CONDITIONS

B. Slope Stability Requirements for Single Family Units

The Purpose of Slope Stability Requirement For Single Family Units: Structures built near streams may negatively affect streams and streamside resources as well as the structure itself. Some potential issues include:

1. Adverse effects on streamside slopes, including effects on slope stability and erosion, and related hazards to structures built on streamside properties
2. Adverse effects on flood control facilities and related infrastructure

3. Adverse effects on local drainage facilities and related infrastructure
4. Adverse effects on riparian corridors and associated vegetation and related erosion impacts
5. Adverse effects to streams, including the effects of down-slope sedimentation and altered stream hydrology, and related impacts to water quality in streams
6. The structure itself can be undermined over time as the streambank erodes due to the dynamic nature of the stream resulting in health and safety hazards

The following Slope Stability Requirements are intended to serve as development standards, that when used, will help enable the location of structures on streamside properties in a manner that avoids or minimizes impacts to streams, streamside natural resources, flood control facilities, local infrastructure and the structure itself.

Slope Stability Requirements as a ‘Geotechnical Trigger’ for Permit Review

If a structure is proposed to be located closer to the Top of Bank than indicated by the following Slope Stability Requirements, this may serve as a trigger for local permitting agencies to require site-specific technical information related to precise slope conditions. If a property owner is proposing to place structures closer to a streamside slope than allowed by the Slope Stability Requirements, the permitting agency should require further study of on-site geotechnical soil and slope stability conditions. The purpose of the study is to determine:

1. whether or not the location of a proposed structure may threaten bank stability, and
2. whether or not the bank instability may threaten structures and/or potentially cause a health and safety hazard.

For banks of larger streams, or for streams that are deeply incised or have highly erodable banks, a permitting agency may need to require on-site geotechnical analyses even if the Slope Stability Requirement are met.

II.C Slope Stability Protection Area for Single-Family Units¹

The “Slope Stability Protection Area” is an area between a structure and the stream². In some cases, a range of numbers is indicated. The assumption is that each local jurisdiction will select one of the numbers based on their existing priorities, permitting processes, and on-site conditions. It is also assumed that the channel depth of most streams in urban Santa Clara County is 10 feet deep or less. For streams, deeper than 10 feet, there should be a 2 to 1 protection area as measured from the toe of the bank.

	Stream with Little or No Hardening	Structurally ³ Engineered System	Ephemeral Stream
Size of Protection Area (as measured from Top of Bank) ⁴	25 - 20 ft.	15 ft.	10 - 15 ft.

Note: Potential Additions to the Slope Stability Protection Area

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2. For a large lot (greater than 10,000 sq. ft), add 5 feet.
3. For a large home in which the FAR triggers a discretionary review, work with applicant to ensure that impacts such as drainage are redirected away from a stream and pursue opportunities to increase the slope stability protection area to better protect the stream (and home) from impacts. For example, consider decreasing the required front yard setback in order to accommodate an increased rear yard setback/slope stability area.

III. Encroachments between the Top of Bank (e.g. bridges, retaining walls)

Introduction: In addition to the G&S's below, any construction activities proposed below the top of bank are subject to review and permit authorization from the Regional Water Quality Control Board, California Department of Fish and Game, and in most cases, the US Army Corps of Engineers and their Federal consulting agencies.

III.A.STANDARD: Overhang Top of Bank

Decks, pathways, buildings or any other structures (excluding road crossings, outfalls, and bank protection structures) may not overhang or encroach beyond or within the top of bank. When illegal structures are identified, which cause public health and safety problems and/or damage to stream resources, appropriate jurisdiction should take actions to have them removed or modified.

III.B1. Design/Construction Related to Encroachments between the Top of Bank

The construction of clear span structures is preferred for new and replacement bridges. Bridge piers may be allowed if length of span makes clear span infeasible as determined by the local jurisdiction. If bridge piers are used they should be pier walls or large diameter (4') piers and if feasible not be placed in the active channel (see definition in Glossary).

III.B2. Design/Construction Related to Encroachments between the Top of Bank

If a structure must be placed in the active channel (See definition in Glossary) due to structural requirements, feasibility, or otherwise, a geomorphic, biological impacts, and/or hydraulic analysis will be required. SCVWD must be consulted and it will usually require a Streambed Alteration Agreement (SAA), Regional Water Board Water Quality Certification, US Army Corps authorization, and other state and federal approvals. For construction of new bridges, loss of riparian, or aquatic habitat beneath the bridge should be mitigated and located as close to the new bridge as possible.

III.B3. Design/Construction Related to Encroachments between the Top of Bank

Have footings and pile caps that are designed based on channel scour to prevent erosion. The appropriate foundation depth should be determined by a licensed engineer and should be at minimum three (3) feet below active channel invert.

If depth of waterway allows, clearance under the bridge should be a minimum 12 feet for maintenance access or access to the stream should be provided from road.

¹ Single Family Unit refers to both (a) new single family units on existing lots of record and (b) new single family remodels/rebuilds as defined by local regulations/policy/ guidelines.

²In addition to protecting this area, BMP's should be used that are reflective of Guidelines and Standards, for activities adjacent to this areas where discretionary review is used (i.e redirecting drainage away from the stream and no removal of native riparian plants.

³ A "structurally engineered system" is designed to provide slope stability. It may be a concrete-lined channel (U-frame or trapezoidal) or a stream substantially modified with riprap, gabions, structurally engineered sacked concrete, etc.

⁴ Area measured for Slope Stability Requirement to be measured based on location of Top of Bank, whether stream is on or off of property.

III.B4. Design/Construction Related to Encroachments between the Top of Bank

Structures must not reduce the active channel or active floodplains' conveyance area or redirect flow to the detriment of another bank or the river bed. Designs in SCVWD jurisdictional areas must be capable of conveying 100-year design flow and meet SCVWD's freeboard requirements explained in Design Guide.

EXCEPTION: If structure may reduce the conveyance area or encroach into freeboard area, a hydraulic analysis will be required to demonstrate no increase in erosive velocity or flood elevations. Hydraulic analysis must be in HECII or HEC-RAS format (small rural streams may utilize simpler hydraulic analysis methods) and must model debris loading on piers (3 times the pier width) and include a scour analysis. Analysis must be acceptable to SCVWD.

III.B5. Design/Construction Related to Encroachments between the Top of Bank

Encroachments in active channels and active floodplains must provide for fish passage and not impact aquatic life.

EXCEPTION: Consideration of exceptions for fisheries impacts must be coordinated with NMFS, USFWS, CDFG, RWQCB and would require biological impacts analysis as well as a Streambed Alteration Agreement.

III.C. Water Rights Related to Encroachments between the Top of Bank

SCVWD permits required for diversion of surface water (removal of water from stream) in areas where District releases water to stream. Construction-related water diversions must also conform to DFG water diversion guidelines, and are subject to a biological assessment.

EXCEPTION: Stream owners may have riparian rights to water in stream. Owners must file statements with State Water Resources Control Board.

V. EROSION PREVENTION AND REPAIR - PROPOSED GUIDELINES AND STANDARDS

Introduction: Any project that may impact a watercourse requires at minimum notification to DFG and the Water Quality Control Board, and may require an Streambed Alteration Agreement (SAA) and/or a water quality certification. Notification to the Corps, NOAA, and USFWS would depend on the activity and jurisdiction.)

IV.A. The potential for erosion needs to be evaluated and steps must be taken to eliminate or significantly reduce the chance of erosion for each proposed project. Where known, the root cause and extent of any erosion must be identified, described and reported to the appropriate agency or agencies prior to any attempts to repair erosion sites so that the actual source of the problem can be corrected. All repair project proposals should include an evaluation for the potential impacts on both downstream and upstream banks.

IV.B. Erosion Design/Construction

- a. Remediate source of erosion if onsite ie, roof downspouts or overbank drainage.
- b. Design of erosion protection must utilize the softest possible method appropriate for the stream characteristics. This would range from biotechnical (using watershed specific native vegetation) slope protection techniques to hybrid slope protection such as vegetative slope with rock boulders at toe.
- c. Use of hardscape materials like rock or concrete should be avoided. If used, hardscape elements will require project proponents to mitigate impacts by planting appropriate native riparian vegetation onsite or at another suitable location. Mitigation requirements will need approval by regulatory agencies.

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- d. Retaining walls placed within the banks of the watercourse for development or erosion repair should be discouraged (Refer to Design Guide for options on erosion repair techniques and SCVWD Stream Maintenance Program).

EXCEPTION: In some instances, constructability may be used as justification to select another method. But it must be demonstrated that all softer methods have been evaluated and that any proposed method will reduce erosion and not cause erosion or negatively impact proper stream function in other areas.

IV.B2. Erosion Design/Construction: Cutoff walls or keys used for bank protection and erosion repairs should be designed anticipating scour depth. Must be a minimum of 3 feet deep.

IV.B3. Erosion Design/Construction:

- a. If erosion protection extends into active channel, evaluate post construction erosion potential due to change in stream dynamics caused by design. This can be done through hydraulic analysis in combination with tractive force or allowable velocities.
- b. Channel repairs should match the contour of the upstream and downstream banks to prevent constrictions and increased potential for erosion.
- c. Over-steepened banks should be laid back to a more stable configuration whenever possible.

EXCEPTION: Exceptions to hydraulic analysis requirements are allowed for small repairs (generally less than 20 feet in channel length) but review by the District and appropriate regulatory agencies will help determine whether smaller repairs have the potential to negatively impact the stream

IV.B4. Erosion Design/Construction: Evaluate flood potential if the repair method reduces stream cross-section or increases stream roughness a hydraulic analysis is required to demonstrate no increase in flood elevations (flooding on adjacent properties or reduction in minimum freeboard requirement). District should be consulted to ascertain whether there are channel reaches that have sufficient freeboard to accommodate vegetation without a full hydraulic analysis. This may help facilitate the use of vegetation and reduce the burden on homeowners. Hydraulic analysis must be in HECII or HEC-RAS format (exceptions may be made for small rural streams).

IV.B5. Erosion Design/Construction:

For construction, require implementation of erosion and sediment control measures. (See the "Erosion and Sediment Control Field Manual" developed by the Water Quality Control Board.)

Bare earthen slopes resulting from work must be treated to minimize erosion and prevent sediment from entering streams and other aquatic habitats. See Design Guide for recommendations for seed mixes to be used with/without native plants.

EXCEPTION: In general, all bare earth slopes must be treated to prevent erosion and control sediment. Exceptions can be allowed on bare earth slopes if it can be shown that the bank will not erode or runoff/sediment will not go to the stream or other aquatic habitats.

VI. GRADING

Introduction: In addition to the G&S's below, grading activities proposed below the top of bank and/or in the riparian corridor are subject to review and permit authorization from the Regional Water Quality Control Board, California Department of Fish and Game, and in most cases, the US Army Corps of Engineers and their Federal consulting agencies.

V.A. Drainage Related to Grading

Grading must address drainage. Drainage that avoids the need for outfalls, or reduces the size and/or number of outfalls is encouraged. See outfalls and drainage section and Design Guide for grading options next to streams.

EXCEPTION: See outfalls and drainage section for explanation of exceptions.

V.B. Construction Related to Grading

Grading adjacent to streams must be in compliance with NPDES general permit, where applicable, but must at a minimum provide for buffer areas and vegetated swales between the stream and graded areas. As appropriate, follow the SCVURPPP BMPs for construction activities, as contained in "Blueprint for a Clean Bay", and the "California Storm Water Best Management Practice Handbook for Construction."

In compliance with the statewide General Permit for Construction, grading activities that disturb one acre or more of land require the project proponent to prepare and have on site a Storm Water Pollution Prevention Plan. Contact the Regional Water Quality Control Board for details.

EXCEPTION: Exceptions are allowed per each municipality's drainage ordinance and NPDES permits. Exceptions from swale and BMP's are allowed if there are other run-off controls in place to protect water quality.

V.B.2. Construction Related to Grading

Recommend that fill be placed adjacent to dry side of the levee to minimize the levee height. (see example in Design Guide)

EXCEPTION: Fill not recommended if it causes drainage problems, disturbs wetlands, creates safety concerns, or impacts aesthetics of property.

V.B.3. Construction Related to Grading

Modifications to levees are allowed if a slope stability analysis is performed and any structure that provides support to the levee is designed with long-term life span (50-100 years).

EXCEPTION: Exceptions are allowed (although discouraged) to cuts in levees if for a temporary purpose and repair is completed by the beginning of October and a performance bond is used to assure completion.

V.B.4. Construction Related to Grading

Grading adjacent to drinking water reservoirs (Calero, Anderson, Lexington, Coyote, Almaden) must be acceptable to the District, which may require water quality monitoring depending on project's potential for adverse impacts. Consider protective measures in source water protection zones and sensitive areas of reservoir watersheds. See Section I. Erosion and sediment control measures are required to prevent sediment contribution from the construction area to the reservoir.

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VII. OUTFALLS, PUMP STATIONS AND SITE DRAINAGE

Introduction: A discharge to a watercourse requires notification to DFG, RWQCB, and Corps.

VI.A. Site Drainage

1. Runoff must not be directed across stream watershed boundaries as a result of grading or through storm drain system design.
2. Direct site drainage through vegetated areas or stilling basins prior to discharge or collection in storm drain system. No concentrated overbank drainage is allowed (e.g. roof overhangs or downspouts). If overbank drainage will occur, use vegetative buffer strips or direct drainage to landscaped areas. Follow Efficient Water Use Landscape Ordinances to minimize runoff.

VI.B. Outfalls

Prefer that there are no new outfalls, However, if there is no way to avoid new outfalls then the following applies:

1. Minimize the number of outfalls.
2. New channel outfalls must conform to the local municipality's drainage master plan.
3. Slope protection for outfalls must meet SCVWD minimum engineering standards using softer slope protection methods if possible (see Design Guide). Outfalls should not overhang the bank or bed as this can lead to excessive channel erosion.
4. Minimum diameter is 12 inches and discharge must be oriented downstream and pipe invert should be at least 2 feet above the stream bottom in areas where sediment deposition is anticipated.
5. Flap gates will be installed when 100-year water surface is above adjacent ground at inlet. Outfalls with flap gates require dormers or similar designs to isolate the flap gate and keep them out of flow area (see Design Guide).
6. Outfalls on federal projects (Coyote Creek downstream of Montague Expressway, Guadalupe River downstream of Blossom Hill, Llagas Creek downstream of Buena Vista, and Uvas Creek downstream of Santa Teresa) must be submitted to SCVWD to coordinate federal review and approval.
7. In conjunction with new or redevelopment, abandoned outfall pipes and slope protection must be removed and the stream bank restored to similar condition existing upstream and downstream of site.
8. Permits are needed from Dept of Fish and Game, U.S. Army Corps, and RWQCB. See Design Guide.

VI.B2. Outfalls Discharge must not pollute receiving water or cause channel erosion. Non storm water discharges not already subject to existing NPDES requirement will be subject to approval and permit from RWQCB.

VI.C1. Storm Drainage Pump Stations

Limit pump discharges to the extent feasible during peak flows to minimize potential impacts from flooding. When a development requires a storm drain pump station that discharges to a stream, require discharge management plan that addresses pump operation during high water (flood) events. See Design Guide for list of criteria needed to prepare a discharge management plan.

VIII. CHANNELIZATION

VII.A. Undergrounding Creeks

Watercourses must not be buried or put into culverts. The exception for culverts only is for road crossings though they should be clear-span whenever possible

If culverts are used they must carry the bankfull flow, accommodate a modified floodplain drainage and where feasible accommodate a 100 year flow rate. This is accomplished with multi-stage culverts with cross-sections designed to carry different flows. Regional debris or sediment basins that will be owned or maintained by SCVWD must be designed for 50-year sediment capacity.

Filling creeks to accommodate grading and construction for developments is not permissible until impact avoidance and minimization efforts are maximized. In the event that impacts are determined to be unavoidable, adequate mitigation must be proposed.

EXCEPTION: CEQA document must be prepared to provide mitigation for impacts of burying stream and appropriate regulatory agency permits, such as a Streambed Alteration Agreement (SAA) must be obtained. The city/county storm drain system, whether in pipes or roadside ditches, is not included in this standard.

VII.B. Open Channel Modification

For modifications to open channels the following applies:

1. The design must consider stream dynamics and induced flooding. A hydraulic analysis as described in Section II acceptable to SCVWD will be required.
2. Recommend restoration of natural stream processes if possible.
3. Impacts to habitat must be avoided or mitigated.
4. Stream conveyance area must be designed for 100-year design flow with freeboard, if along a SCVWD jurisdictional area.
5. SCVWD will request dedication of right-of-way for stream modification projects, including an 18-22 foot wide maintenance area.
6. Notification and securing of appropriate state and regulatory permits, such as a SAA.

EXCEPTION: If active channel and floodplain will not contain the design 100-year flow, then the design can be based on existing capacity with the allowance for providing additional active floodplain width in the future to contain the design 100-year flow. Streams to be dedicated to SCVWD must include an 18-22 foot wide maintenance area. In addition, flood capacity less than the 100-year flow is acceptable if the community in the flood zone is willing to accept less protection and ongoing flood insurance requirements.

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IX. UTILITY ENCROACHMENTS

Introduction: In addition to the G&S's below, such encroachments may require other State and Federal permits such as a Streambed Alteration Agreement (SAA).

A. Longitudinal (parallel) encroachments. Longitudinal (parallel) encroachments are not allowed in SCVWD right-of-way.

EXCEPTION: Longitudinal encroachments are discouraged and may only be considered with demonstration that all other alternatives have been considered, there is a benefit to SCVWD and future removal will not be necessary considering SCVWD interests. No water pipelines may be installed within a levee.

B. Utilities Crossings

1. Utility pipes or conduits must go under the stream or be in or attached to the downstream face of a bridge and must go under any levees. Provide locations for future utility crossings in design of new or replacement bridges.
2. Any utilities under the stream must be concrete encased or placed in sleeve.
3. Borings must be 5 feet below lined channels and 8 feet below unlined channels. Recommend under-channel utilities be installed by directional bore.
4. For cut and cover, clearance must be a minimum of three (3) feet and based on scour depth and replacement of fill in levees is subject to SCVWD specifications.
5. Any aerial utility crossings (e.g. PG&E and phone lines) meet minimum OSHA vertical clearance criteria. (22 feet for non-power lines, 26 feet for power lines less than 600 volts, 30 feet for power lines from 600 to 50,000 volts) to allow safe use of maintenance equipment.
6. Crossings of treated (potable and recycled) water pipelines must meet Department of Health Services clearance requirements. (see Design Guide for standards for crossings of SCVWD pipelines and City/ County requirements for other pipeline clearances)
7. Directional drilling projects using bentonite or other lubricants to go beneath or near streams and aquatic habitats will require development of a fracout prevention and response plan describing how water quality will be protected in the event of fracout

EXCEPTIONS: If not feasible to go under or attach to the downstream face of bridge, the utility crossing may be located on the upstream face of bridge if the design would not catch debris, would be capable of surviving impacts from floating debris in high flow and would not hinder emergency debris removal or maintenance operations.

IX. TRAIL CONSTRUCTION

IX.A. Design/Construction Related to Trail Construction

Joint Use Pedestrian/Bicycle Paths are encouraged along creeks. Trails must be located so as to avoid impacts to the stream and riparian areas. Paved multi use trails should be placed so as to maximize distance from stream and riparian areas. Construction must not require deep excavation within tree root zones.

- Minimize trail alignments and footprints and locate them at a distance from streams that will best protect stream and riparian resources.
- Trail projects will not result in negative impacts to riparian areas or streams.

EXCEPTION: Exceptions may be allowed if impacts are addressed and determined to be unavoidable in a CEQA document and approved by appropriate regulatory agencies.

IX.A2. Design/Construction Related to Trail Construction

Design must be consistent with the Santa Clara County Parks and Recreation Department's Interjurisdictional Trail Guidelines (Appendix X). Night lighting of trails along riparian corridors should be avoided.

EXCEPTION: Exceptions may be allowed if impacts are addressed and mitigated in a CEQA document and approved by appropriate regulatory agencies.

IX.A3. Design/Construction Related to Trail Construction

Memorial plaques along trail corridors on SCVWD right of way are subject to jurisdiction review and approval.

EXCEPTION: With appropriate planning and community contribution, a memorial area recognizing community members will be considered.

IX.B. Trails on SCVWD right of way require an agreement that defines maintenance, management, and liability responsibilities of facilities.

X. SEPTIC SYSTEMS

X.A. Design Of Septic Systems

Follow requirements of RWQCB or Santa Clara County as applicable including: Leach field setback 100' from top of bank, 50' from swale, 200' from high water mark of reservoir, prohibited in 10 year floodplain or areas observed to flood from field observations. Consult with SCVWD to determine whether land feature is an active floodplain or swale and assist in determining high water marks at reservoirs.

EXCEPTION: Exceptions or variances are allowed per RWQCB or Santa Clara County requirements. Please note that since 10 year floodplain maps do not exist, any area of historical flooding should be assumed to be in the 10-year floodplain.

XI. Trash Control and Removal

XI.A. Locate trash bins away from streams and follow other measures outlined in NPDES guidance.

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XII. PROTECTION OF WATER QUALITY

XII.A. Water Quality

Cities, County, and SCVWD should comply with applicable provisions of stormwater permits, such as C.3.i. of SCVURPPP's stormwater permit (Water Board Order No. 01-119) and/or Stormwater Phase II regulations. Implement Infiltration Guidelines in the SCVRPPP C.3 handbook. Retention ponds and infiltration trenches that do not meet guidelines will be reviewed by the SCVWD and the Regional Water Quality Control Board.

XIII. GROUNDWATER PROTECTION

XIII.A. Groundwater

Require groundwater resource assessments (See Design Guide) when potential for significant groundwater supply or groundwater quality impacts. The changes in land use where these impacts may be significant are anticipated to be subject to CEQA

XIII.A2 Groundwater

To protect Santa Clara County groundwater recharge areas, new high risk activities defined by DHS should be prohibited in well head protection areas as designated on District GIS Maps. Manage (limit, monitor and implement best management practices) existing high-risk activities in recharge areas of basin (District GIS maps area available).

XIII.A3. Groundwater

The owners must show any existing wells on the plans. The wells must be properly registered with the SCVWD and either be maintained or destroyed in accordance with SCVWD standards. Property owners or their representative must contact the SCVWD's Wells and Water Production Unit for more information regarding well permits and registration or destruction of any wells.

XIV. FLOOD PROTECTION

XIV.A. Flooding Protection

For development within special flood hazard zones A, AE, AH, AO, the project must comply with FEMA requirements as implemented by the City or County. Consider when and how to recommend increased levels of protection as described in Dept of Water Resources Model Floodplain Ordinance, recommendations of California Floodplain Management Task Force (Dec 2002), and SCVWD's Community Rating System Program.

EXCEPTION: Exceptions or variances allowed per City or County Ordinances, Policies, or other implementation documents.

XIV.A2. Flooding Protection

In zone A (areas where base flood elevations have not been determined) require a hydraulic analysis to determine the base flood elevation for subdivisions greater than 5 acres or 50 lots whichever is lesser. For other construction and substantial improvements, utilize any other available base flood elevation data as criteria for meeting NFIP requirements. Refer to FEMA publication "Managing Floodplain Development in Approximate Zone A Areas".

EXCEPTION: Not required for existing homes/non-substantial improvements.

XIV.A3. Flooding Protection

If a proposed project will result in a significant increase in land use density¹ (i.e. an agricultural area changes to residential or industrial), the local jurisdiction should work cooperatively with SCVWD to determine (1) what information is needed on a project specific basis to evaluate potential increases in flood flows and (2) what mitigation measures can be implemented to mitigate for impacts to flood conveyance capacity and/or flood protection.

For example, in terms of information and analysis needs, a hydrologic analysis may be needed to identify the impacts (water surface increases cannot exceed 0.1 foot) so that flooding will not increase and improved flood protection facilities will maintain the minimum freeboard requirements). SCVWD will provide technical assistance in the form of existing hydraulic model runs where available, and hydrologic information.

In terms of possible mitigation options, detention basins may be used to mitigate the impact, but they must be properly designed (see Design Guide) and maintained. Design should be in concert with hydromodification facilities and consider regional solutions. SCVWD can also provide technical assistance regarding mitigation actions.

XIV.A4. Flood Protection

For major developments near streams subject to CEQA review that are compatible with the General Plan utilized for developing District hydrology and FEMA floodmaps, development must not, increase site runoff so as to increase depth (0.1 foot increase in water surface) or lateral extent of flooding or increase discharge in local streams as outlined in the storm water permit for the SCVURPPP. A hydraulic analysis prepared by registered civil engineer demonstrating that any flood impacts will not be created is required.

¹ The District's hydrology and design flood flow rates were developed in the late 1970's using the land use designations shown on General Plans in place at that time. These flow rates have recently been updated, but the impact has not yet been analyzed. In general, the changes in land use that could significantly impact runoff quantities are typically those outside the urban service area, in south county and those developments where the change in land use will be subject to CEQA review. The impacts to be addressed are to flood conveyance facilities designed using 1978 (or prior) flow rates and built to provide 100 year flood protection and impacts to flood prone areas which were also determined using the 1978 flow rates.

SLOPE STABILITY REQUIREMENTS FOR SINGLE-FAMILY UNITS ON STREAMSIDE PROPERTIES

(Ratified by the Water Resources Protection Collaborative on April 28, 2005)

The Purpose of Slope Stability Requirements

Structures built near streams may negatively affect streams and streamside resources as well as the structure itself. Some potential issues include:

1. Adverse effects on streamside slopes, including effects on slope stability and erosion, and related hazards to structures built on streamside properties
2. Adverse effects on flood control facilities and related infrastructure
3. Adverse effects on local drainage facilities and related infrastructure
4. Adverse effects on riparian corridors and associated vegetation and related erosion impacts
5. Adverse effects to streams, including the effects of down-slope sedimentation and altered stream hydrology, and related impacts to water quality in streams
6. The structure itself can be undermined over time as the streambank erodes due to the dynamic nature of the stream resulting in health and safety hazards

The following Slope Stability Requirements are intended to serve as development standards, that when used, will help enable the location of structures on streamside properties in a manner that avoids or minimizes impacts to streams, streamside natural resources, flood control facilities, local infrastructure and the structure itself.

SLOPE STABILITY REQUIREMENTS AS A 'GEOTECHNICAL TRIGGER' FOR PERMIT REVIEW

If a structure is proposed to be located closer to the Top of Bank than indicated by the following Slope Stability Requirements, this may serve as a trigger for local permitting agencies to require site-specific technical information related to precise slope conditions. If a property owner is proposing to place structures closer to a streamside slope than allowed by the Slope Stability Requirements, the permitting agency should require further study of on-site geotechnical soil and slope stability conditions. The purpose of the study is to determine:

- (1) whether or not the location of a proposed structure may threaten bank stability, and
- (2) whether or not the bank instability may threaten structures and/or potentially cause a health and safety hazard.

For banks of larger streams, or for streams that are deeply incised or have highly erodable banks, a permitting agency may need to require on-site geotechnical analyses even if the Slope Stability Requirement are met.

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SLOPE STABILITY REQUIREMENTS FOR SINGLE-FAMILY UNITS¹ ON STREAMSIDE PROPERTIES

1. Does the Slope Stability Requirement Apply?

	Stream on Property	Stream not on Property
Permit required is ministerial. ²	Yes	Yes
Permit required is discretionary.	Yes	Yes

2. Slope Stability Protection Area (if not exempt)

The "Slope Stability Protection Area" is an area between a structure and the stream². In some cases, a range of numbers is indicated. The assumption is that each local jurisdiction will select one of the numbers based on their existing priorities, permitting processes, and on-site conditions. It is also assumed that the channel depth of most streams in urban Santa Clara County is 10 feet deep or less. For streams, deeper than 10 feet, there should be a 2 to 1 protection area as measured from the toe of the bank.

	Stream with Little or No Hardening	Structurally ³ Engineered System	Ephemeral Stream
Size of Protection Area (as measured from Top of Bank) ⁴	25 – 20 ft.	15 ft.	10 - 15 ft

3. Potential Additions to Slope Stability Protection area

- For a large lot (greater than 10,000 sq. ft), add 5 feet.
- For a large home in which the FAR triggers a discretionary review, work with applicant to ensure that impacts such as drainage are redirected away from a stream and pursue opportunities to increase the slope stability protection area to better protect the stream (and home) from impacts. For example, consider decreasing the required front yard setback in order to accommodate an increased rear yard setback/slope stability area.

¹ Single Family Unit refers to both (a) new single family units on existing lots of record and (b) new single family remodels/rebuilds as defined by local regulations/policy/ guidelines

² In addition to protecting this area, BMP's should be used that are reflective of Guidelines and Standards, for activities adjacent to this areas where discretionary review is used (i.e redirecting drainage away from the stream and no removal of native riparian plants

³ A "structurally engineered system" is designed to provide slope stability. It may be a concrete-lined channel (U-frame or trapezoidal) or a stream substantially modified with riprap, gabions, structurally engineered sacked concrete, etc.

⁴ Area measured for Slope Stability Requirement to be measured based on location of Top of Bank, whether stream is on or off of property.