State Water Resources Control Board

Division of Water Quality
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Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

John Kopchik
Principal Planner
Contra Costa County
Community Development Department
651 Pine Street, 4th Floor North Wing
Martinez, CA 94553

Dear Mr. Kopchik;

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT (EIS/EIR) FOR THE EAST CONTRA COSTA COUNTY HABITAT CONSERVATION PLAN AND NATURAL COMMUNITY CONSERVATION PLAN

Thank you for the opportunity to comment on the EIS/EIR for the proposed East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (ECCCHCP/NCCP). The proposed ECCCHCP/NCCP is a multi-jurisdictional plan that provides for regional species conservation and habitat planning while allowing anticipated development. The ECCCHCP/NCCP is being prepared by the ECCC/HCP authority (HCPA), a joint powers authority composed of the cities of Brendwood, Clayton, Oakley, and Pittsburg; Contra Costa County; the Contra Costa Water District; and the East Bay Regional Park District. The EIS/EIR evaluates the potential impacts of approval of the ECCCHCP/NCCP. The EIS/EIR does not substantively analyze impacts of, identify alternatives to, or propose mitigation for the effects of urban development on water resources within the HCP area. The EIS/EIR acknowledges that future development projects will be subject to additional project-specific CEQA review, which will provide the information needed to assess and mitigate project-specific impacts.

Because the project will apparently affect waters within the jurisdictions of the San Francisco Bay and Central Valley Regional Water Quality Control Water Boards (Regional Water Boards), the State Water Resources Control Board (State Water Board) will take the lead regulatory role in considering CWA §401 water quality certification for discharges occurring in association with the ECCCHCP/NCCP, in consultation with the affected Regional Water Boards. Our comments focus primarily on discharges regulated under CWA §401, the Porter-Cologne Water Quality Control Act, and our storm water program. Our comments are submitted in compliance with CEQA *Guidelines* §15096, which requires CEQA responsible agencies to focus on shortcomings in draft environmental documents, to identify additional alternatives or mitigation measures, to be as specific as possible, and to support comments with appropriate documentation.

In brief, the draft EIS/EIR does not address the water quality effects of dredge and fill discharges associated with future urban development in the HCP/NCCP area. As a CEQA responsible agency, the State Water Board cannot permit discharges absent adequate CEQA analysis. We understand from personal communications that the HCPA does not intend that the EIR/EIS supports discharge-specific regulatory decisions, but expects to ask the Water Boards to consider developing a streamlined permitting process for discharges which comply with the HCP. The draft EIS/EIR provides no description or analysis regarding the proposed streamlined process. O-1

As a CEQA responsible agency the State Water Board cannot enter into agreements having regulatory force without appropriate CEQA analysis. The State Water Board can consider for certification any discharges analyzed in the final EIS/EIR; and could consider a streamlined permitting process to the extent that the potential significant adverse effects of that process are considered in the final EIS/EIR, appropriate analyses provided, and mitigations identified. Because the present document provides us no opportunity to comment specifically on the County's proposal, it may be useful to schedule a further review after the proposal has been articulated in the EIS/EIR. O-2

Water Boards' Regulatory Role

The State and Regional Water Boards regulate discharges which could affect the quality of waters of the State, in order to protect the chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.[1] A number of activities associated with the project will apparently require permits issued by the State or Regional Water Boards. The required entitlements appear to include:

- Discharge of fill material - Clean Water Act (CWA) §401 water quality certification for federal waters; or Waste Discharge Requirements for non-federal waters,
- Land disturbance - CWA §402(p) storm water permit,
- Wastewater discharge - CWA §402 NPDES permit
- Other - Waste Discharge Requirements may be needed for discharges of waste that affect groundwater quality, such as from a solid waste transfer facility or landfill.

Scope of our comments.

To provide a baseline of comprehensive information, our comments address the shortcomings of the EIS/EIR as the basis of a general water quality certification for dredge and fill discharges associated with urban development in the HCP/NCCP area. More generally, the following considerations would also be relevant to a programmatic agreement for streamlined permitting.

Specific technical comments are included in Enclosure 1, *ECCCHCP: Identification of Potential Water Quality Impacts and Required Analyses (Impacts Identification)*, which lists the potential effects of land development on water quality, and the related information needed by the

[1] Water Code section 13050(g)

Water Boards. Effective analysis requires consideration of the interactions of these effects, and these are displayed in a flowchart in the *Impacts Identification*.

General advice regarding the scope and content of the environmental information germane to the statutory responsibilities of the State and Regional Water Boards follows.

Scope and Level of Needed Analyses.

Urban development degrades water quality through a complex of interrelated causes and effects which, if unmanaged, will ultimately destroy the physical, chemical, and biological integrity of the watersheds in which they occur. The primary adverse impacts of poorly planned development projects on water quality are:

- the direct physical impacts to aquatic, wetland, and riparian habitat and other beneficial uses;
- generation of construction-related and post-construction urban pollutants;
- alteration of flow regimes and groundwater recharge as a result of impervious surfaces and storm drain collection systems;
- disruption of watershed level aquatic functions, including pollutant removal, floodwater retention, and habitat connectivity.

These factors have historically resulted in a cycle of destabilized stream channels, poor water quality, and engineered solutions to disrupted flow patterns, culminating in loss of natural functions and societal values in the affected basins.

The number and variability of the pathways through which water quality degradation can occur complicates analysis, but understanding how these pathways operate within the specific circumstances of this project is essential to effectively mitigating adverse effects. Fortunately, avoidance or minimization of any causal link will obviate or reduce subsequent effects and needed analyses, and a relatively small number of key variables mediate most of the pathways causing water quality degradation.

As stated in ECCCHCP/NCCP and the draft EIS/EIR for ECCCHCP/NCCP, the purpose of the proposed project is to avoid, minimize, and compensate for impacts on covered species for which incidental take permits are required. Although mitigation of impacts to covered species will often protect water quality, the Water Boards' mission to preserve water quality and the beneficial uses specified in Basin Plans is not limited to protection of special-status species.

To fulfill their statutory responsibilities, the State and Regional Water Boards need to understand how the ECCCHCP/NCCP will avoid or minimize each potential cause of water quality degradation; what effects will remain unmitigated through planning or project design; and the magnitude of the remaining adverse effects. Quantification should be as definitive as possible, using appropriate modeling and adequate data. Modeling approaches should be documented and data deficiencies or other factors affecting the reliability of the results should be identified and characterized. O-3

Identification of Affected Waters.

Please:

1. provide a map which includes all waters potentially affected by this project;
2. list the affected State waters, including riparian areas as defined by the National Academy of Sciences[2], in tabular format organized by waterbody type, sub-basin, and Regional Water Board jurisdiction;
3. for each water body directly affected by fill or excavation:
   a. identify the affected acreage; O-4
   b. indicate the number of linear feet directly impacted (for drainage features);
   c. provide the sum of the total affected acres and linear feet by waterbody type (lake, unvegetated streambed, riparian, wetland) within each Regional Water Board jurisdiction, and as project total; and
4. identify as a subset any "isolated" wetlands or other waters not subject to federal jurisdiction.

Alternatives Analysis.

Please include the alternative analysis required by the CWA §404(b)(1) *Guidelines* (specified in 40 CFR 230) as part of the alternative analysis in the EIS/EIR.

Urban development in the HCP area has potential to create major water quality impacts. Most construction-related direct impacts to surface waters will likely require CWA §404 permits from the U.S. Army Corps of Engineers (USACE), and will therefore need to conduct an alternatives O-5 analysis consistent with the requirements of the federal CWA §404(b)(1) *Guidelines.* The principals of avoidance which the *Guidelines* articulate are directly relevant to the State and Regional Water Boards' mandate to protect water quality.

Hydrologic Disruption as a Driving Variable.

Please include measures to maintain the pre-project hydrograph in the alternative analyses in the EIS/EIR (see below). O-6 Please also document potential cumulative impacts to watershed hydrology from existing and any other planned development in the HCP area. O-7

Because increased runoff from developed areas is the key variable driving a number of other adverse effects (as discussed and displayed in Enclosure 1, *Impacts Identification*), attention to maintaining the pre-project hydrograph will prevent or minimize other problems and will limit O-8 the need for other analyses and mitigation to be included in the EIS/EIR.

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[2] Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological process, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. They include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines. (National Research Bureau of the National Academy of Sciences. 2002. *Riparian Areas: Functions and Strategies for Management.* National Academy Press, 2102 Constitution Avenue, N. W., Washington, D. C., 20418).

Low Impact Development.

Please include "Low Impact Development" (LID) measures in the mitigation alternatives section of the EIS/EIR.

LID refers to reducing hydrologic disruption from land development or redevelopment. It results in less surface runoff and less pollution routed to receiving waters. Principles of LID include:

- Maintaining natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge, O-9
- Reducing and disconnecting the impervious cover created by development or redevelopment and the associated transportation network, and
- Managing runoff as close to the source as possible.

Enclosure 2, *Low Impact Development References* lists information sources regarding LID.

Decreased Pollutant Removal and Floodwater Retention.

Development in the HCP area may fill wetlands, riparian area, or streams, eliminating their natural pollutant removal and floodwater retention functions. Please characterize the loss of these functions, quantify to the maximum degree possible the direct and indirect impacts within the affected basins, and describe how the loss will be mitigated. O-10 For example, loss of floodwater retention may result in increased peak flows, channel erosion, loss of riparian habitat, increased water temperature, increased pollutant runoff, etc. as described in *Enclosure 1*.

Habitat Connectivity

We understand the purpose of the ECCCHCP/NCCP is to preserve habitat values, including connectivity, for listed species. However, the EIS/EIR provides no analysis of the potential loss of corridor values in the area proposed for development. Please analyze the regional importance of movement corridors in and along riparian areas and other water bodies in the HCP area, the potential effect of disrupting such corridors, and the potential for enhancing such corridors to provide project mitigation. O-11

Riparian corridors and other waters within the regulatory purview of the State and Regional Water Boards can play important roles in maintaining habitat connectivity. Enclosure 3, *Terrestrial Habitat Connectivity Related To Wetland, Riparian and Other Aquatic Resources*, provides information and references on this subject. Aquatic habitat may also be fragmented by impacts from development and other human activities to streams or other water bodies.

Again, thank you for this opportunity to comment. Attempts to manage the adverse effects of urban development form a large part of the workload of the State and Regional Water Boards' non-point source, stormwater, and water quality certification and wetland programs, as well as our efforts to establish total maximum daily loads (TMDLs) for impaired water bodies. Many of the water bodies currently on the State's list of impaired water bodies are affected by conditions within the purview of local agency planning. However, after-the-fact regulatory control, such as TMDLs, is a poor substitute for planning which avoids water quality degradation at the outset. We therefore welcome the opportunity to work with Contra Costa County to make the ECCCHCP/NCCP an example of superior watershed planning in California.

If we may clarify any of our comments or be of further assistance, please contact Jenny Chen, Certification and Wetlands Unit of State Water Board at 916-341-5570 or at hjchen@waterboards.ca.gov. You may also contact Oscar Balaguer, Chief of the Certification and Wetland Unit at 916-341-5485 or at obalaguer@waterboards.ca.gov.

Sincerely,

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Regulatory Section

Enclosures (3)

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Enclosure 1

State Water Resources Control Board

ECCCHCP: Identification of Potential Water Quality Impacts and Required Analyses

Comments on Draft EIS/EIR For ECCCHCP/NCCP

November 2005

Urban Development:
Potential Water Quality Impacts and Required Analyses

The degraded character of urban streams does not result from any single factor, but rather from the interaction of a variety of detrimental effects.

Klein, 1979

Urban development degrades water quality through a complex of interrelated causes and effects, which, unmanaged, ultimately destroy the physical, chemical, and biological integrity of the watersheds in which they occur. The primary adverse impacts of poorly planned development projects on water quality are:

- the direct impacts to aquatic, wetland, and riparian habitat and other beneficial uses;
- generation of construction-related and post-construction pollutants;
- alteration of flow regimes and groundwater recharge as a result of impervious surfaces and storm drain collection systems;
- disruption of watershed level aquatic functions, including pollutant removal, floodwater retention, and habitat connectivity.

These factors have historically resulted in a cycle of destabilized stream channels, poor water quality, fragmented aquatic and terrestrial habitat, and engineered solutions to disrupted flow patterns, culminating in loss of natural functions and societal values in the affected basins.

The number and variability of the pathways through which water quality degradation can occur complicates analysis, but understanding how these pathways operate within the specific context of each project is essential to effectively mitigating the adverse effects. Fortunately, avoidance or minimization of any causal link will obviate or reduce subsequent effects and needed analyses, and a relatively small number of key variables mediate most of the pathways causing water quality degradation.

This Enclosure consists of a flowchart diagram (Figure 1) displaying the factors potentially affecting water quality, and a table (Table 1) characterizing them.

Figure 1 begins on the left with three activities that are associated with urbanization: filling, construction (construction and post-construction phases), and channelization. Figure 1 ends on the right with the resulting impaired beneficial uses and the potential for increased maintenance and property damage. In between are intermediate processes. Arrows show cause-and-effect relationships, which include synergistic and cumulative effects.

Table 1 briefly describes the causes and effects displayed in Figure 1, provide literature citations for each of the effects, and identifies for each effect the types of project-specific information needed to assess and mitigate each adverse impact to water quality.

POTENTIAL EFFECTS OF URBAN DEVELOPMENT ON BENEFICIAL USES

This diagram shows how urban development can can affect beneficial uses of water.

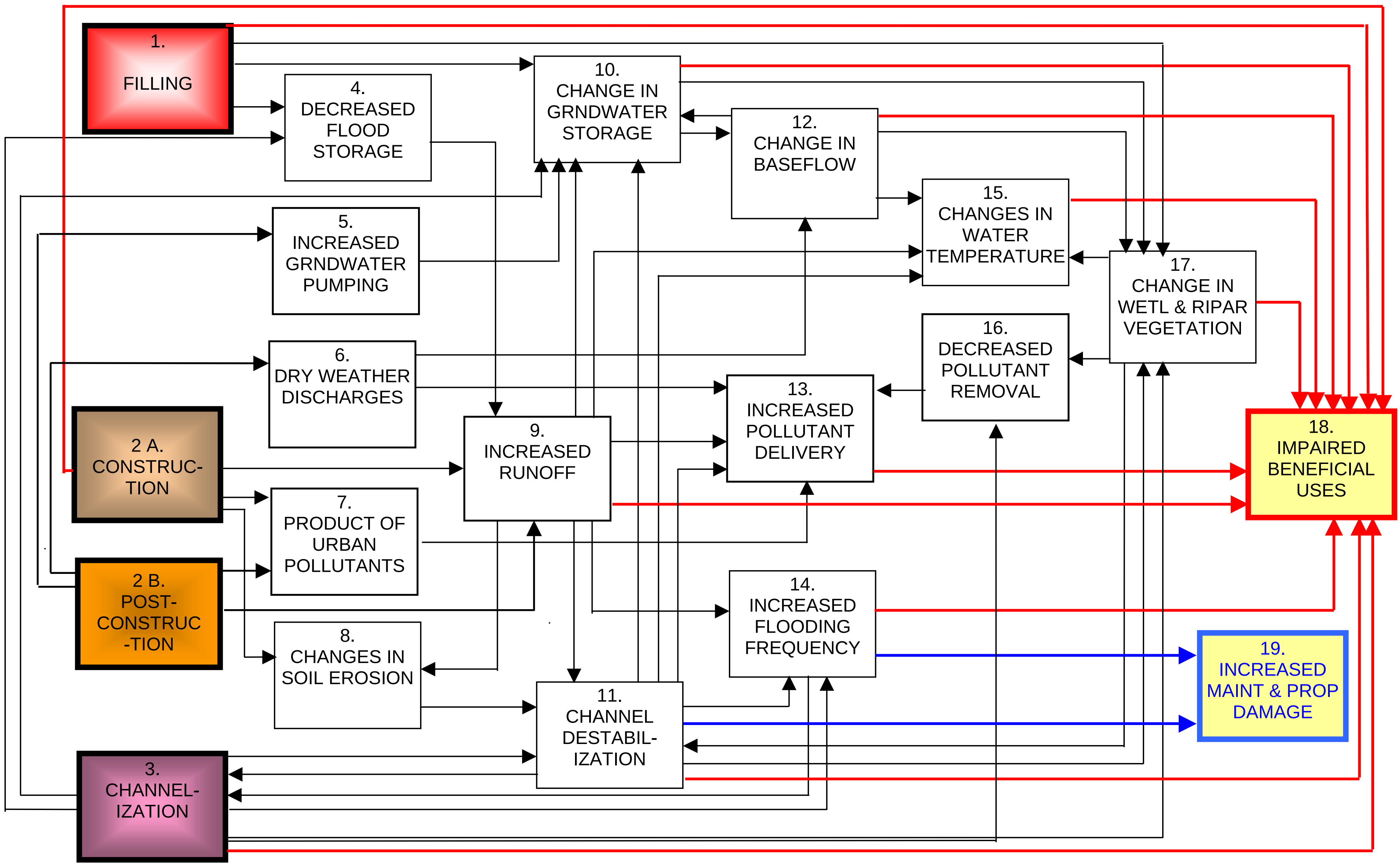

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Figure 1

Enclosure 2

State Water Resources Control Board

Low Impact Development References

Comments on Draft EIS/EIR for the ECCCHCP and NCCP

November 2005

CA NEMO Partnership Resource List

The California NEMO Partnership is an educational program for land use decision makers that addresses the relationship of land use to natural resource protection.

Start at the Source: Design Guidance Manual for Stormwater Quality Protection (1999), and the companion handbook, ***Using Start at the Source to Comply with Development Standards*** (2003). By the Bay Area Stormwater Management Agencies Association (BASMAA). Download at *http://www.scvurppp-w2k.com/basmaa_satsm.htm*

Stormwater Best Management Practices (BMPs) Handbooks (2003), by the California Stormwater Quality Association (CASQA). These four handbooks include a ***New Development and Redevelopment Handbook***. Download at *http://www.cabmphandbooks.com/*

Better Site Design: A Handbook for Changing Development Rules in Your Community (1998). ***Consensus Agreement on Model Development Principles to Protect Our Streams, Lakes, & Wetlands*** (1991). Publications by the Center for Watershed Protection; order at *http://centerforwatershedprotection.goemerchant7.com/*

The Model Urban Runoff Program: A How-to Guide for Developing Urban Runoff Programs for Small Municipalities. Download from the California Coastal Commission website at *http://www.coastal.ca.gov/la/murp.html*

Clearing and Grading Strategies for Urban Watersheds (1995), by The Metropolitan Washington Council of Governments. Order at *http://www.mwcog.org/publications/*

Wildlife Reserves and Corridors in the Urban Environment: A Guide to Ecological Landscape Planning and Resource Conservation (1989), by Lowell Adams and Louise Dove. Order from the Urban Wildlife Resources Bookstore at *http://users.erols.com/urbanwildlife/bookstor.htm*

Growing Greener: Putting Conservation into Local Codes (1997), by Randall Arendt. Download at Natural Lands Trust, Inc. Download at *www.natlands.org/pdffiles/growinggreener.pdf*

Institutional Aspects of Urban Runoff Management: A Guide for Program Development and Implementation (1997), by Eric Livingston and Earl Shaver. Order from the Watershed Management Institute at *http://home.att.net/~ericlivingston/*

The Low Impact Development Center *www.lowimpactdevelopment.org*

Low-Impact Development Design Strategies: An Integrated Design Approach (EPA-841-B-00-003). ***Low-Impact Development Hydrologic Analysis*** (EPA-841-B-00-002). By the Prince George's County, Maryland, Department of Environmental Resources. Both publications can be ordered free of charge through EPA's National Service Center for Environmental Publications at *www.epa.gov/ncepihom/index.htm*

Residential Streets (2001), published by the American Society of Civil Engineers. Order at *http://www.pubs.asce.org/BOOKdisplay.cgi?9991135*

Street Design Guidelines for Healthy Neighborhoods, by the Local Government Commission's Center for Livable Communities. Order at *http://www.lgc.org/bookstore/land_use/publications/healthystreets.html*

The Congress for the New Urbanism. *www.sonic.net/abcaia/narrow.htm*

Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993). ***National Management Measures to Control Nonpoint Source Pollution from Urban Areas*** (updated version). Publications by the U.S. EPA. Download at *http://www.epa.gov/owow/nps/urbanmm/index.html*

Second Nature: Adapting LA's Landscape for Sustainable Living (1999), by TreePeople. Order at *http://www.treepeople.org/vfp.dll?OakTree~getPage~&PNPK=21*

For more information, contact the CA NEMO Partnership:

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The California NEMO Partnership is a charter member of the National NEMO Network.

Enclosure 3

State Water Resources Control Board

Terrestrial Habitat Connectivity Related To Wetland, Riparian, and Other Aquatic Resources

Comments on Draft EIS/EIR for ECCCHCP/NCCP

November 2005

Terrestrial Habitat Connectivity Related To Wetland, Riparian and Other Aquatic Resources,

"Habitat connectivity" refers to the need for plant and animal populations to have some mobility over the landscape, i.e., to avoid becoming "isolated" or "disjunct." [1] In recent decades a large body of research has demonstrated that such "isolated" populations face a high probability of eventual extinction, even if their immediate habitats are spared.[2] In general, the smaller such an isolated population, the more quickly it will die out. Urban development typically fragments habitat by creating artificial landscapes which are movement barriers for most species. Unless mitigation measures are taken, isolated, non-viable populations are created as buildings, roads, and landscaping cut off lines of movement.

In the context of wetlands, "habitat connectivity" refers to three related phenomena:

1. The need of some animals to have access to both wetland and upland habitats at different parts of their life cycle. Some wetland animals, e.g., some amphibians and turtles, require access at different seasons and/or at different life stages to both wetland and to nearby upland. Preserving the wetland but not access to upland habitat will locally exterminate such species.[3]
2. The ecological relationship between separate wetlands. Some wetland communities and their associated species comprise networks of "patches" throughout a landscape. Wetland plants and animals are adapted to the presence of wetland complexes within a watershed and are dependent on moving among the wetlands within the complex, either regularly or in response to environmental stressors such as flood or drought, local food shortage, predator pressure, or influx of pollution. Removing one such water from the complex will reduce the biological quality of the rest, and at some point the simplified wetland complex will be incapable of supporting at least some of the species, even though some wetlands remain.[4]
3. The role wetlands and riparian corridors play in allowing larger-scale movements. Some strategically located wetlands and especially continuous strips of riparian habitat along streams facilitate connectivity at watershed and regional scales for terrestrial as well as aquatic and amphibious species.

As noted above, habitat connectivity is critical to biodiversity maintenance, and will become more so because of global warming. Significant range shifts and other responses to global warming have already occurred. The ability of biotic populations to move across the landscape may be critical to their survival in coming decades.[5]

[1] Such mobility may occur at the level of the individual organism (e.g., a bird or turtle travelling between separated wetlands) and/or of the population (e.g., a plant species colonizing a new wetland through seed dispersal); and over different time scales.

[2] For the effects of habitat fragmentation and population isolation on the survival of plants and animals, see for example:

K. L. Knutson and V.L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian*, Washington Dept. of Fish and Wildlife, Olympia, WA, December 1997, p. 71.

R.F Noss and A.Y Cooperrider, *Saving Nature's Legacy; Protecting and Restoring Biodiversity,* Washington, D.C., Island Press, 1994, pp. 33-34, 50-54, 59-62, 61-62.

D.E. Saunders, R.J. Hobbs, and C.R. Margules, "Biological Consequences of Ecosystem Fragmentation: A Review," *Conservation Biology* 5(1), March 1991, pp. 18-32.

Michael E.Soulé, "Land Use Planning and Wildlife Maintenance, Guidelines for Conserving Wildlife in an Urban Landscape," *Journal of the American Planning Association* 57(3), 1991, pp. 313-323.

Michael E. Soulé, "The Effects of Habitat Fragmentation on Chaparral Plants and Vertebrates," *Oikos* 63, 1992, pp. 39-47.

United States Federal Interagency Stream Restoration Working Group, *Stream Corridor Restoration: Principles, Practices, and Processes*, October 1998, [Online]. Available from: http://www.usda.gov/stream_restoration. Printed copy available from: National Technical Information Service (NTIS), Springfield, VA, pp. 2-80, 2-82.

[3] Regarding the relationship between wetland and upland habitats, see for example:

Vincent J. Burke and J. Whitfield Gibbons, "Terrestrial Buffer Zones and Wetland Conservation: A Case Study of Freshwater Turtles in a Carolina Bay," *Conservation Biology* 9(6), 1995, pp. 1365-1369;

C. Kenneth Dodd , Jr. and Brian S. Cade, "Movement Patterns and the Conservation of Amphibians Breeding in Small Temporary Wetlands," *Conservation Biology* 12(2), 1998, pp. 331-339;

Raymond D. Semlitsch, "Biological Delineation of Terrestrial Buffer Zones for Pond Breeding Salamanders," *Conservation Biology* 12(4), 1997, pp. 1113-1119.

Hilty, J. A. and Merenlender, A. M. Use of Riparian Corridors and Vineyards by Mammalian Predators in Northern California. Conservation Biology 18(1) 126-135; 2004 February.

[4] Regarding the ecological relationship between separated wetlands, see for example:

C. Scott Findley and Jeff Houlahan, "Anthropogenic Correlates of Species Richness in Southeastern Ontario Wetlands, *Conservation Biology* 11(4), 1997, pp. 1000-1009;

Lisa A. Joyal, Mark McCollough, and Malcom L. Hunter, Jr., "Landscape Ecology Approaches to Wetland Species Conservation: A Case Study of Two Turtle Species in Southern Maine," *Conservation Biology* 15(6), 2001, pp. 1755-1762;

Raymond D. Semlitsch and J. Russell Bodie, "Are Small, Isolated Wetlands Expendable?" *Conservation Biology 12(5),* 1998, pp.1129-1133;

National Research Council, *op. cit.,* 2001, p. 42;

Nature Conservancy, *op. cit.*, July 2000, p. 10.

[5] Recent reports comprehensively review observed effects of global change on plant and animal range shifts, advancement of spring events, and other responses. See:

Terry L. Root, Jeff T. Price, Kimberly R. Hall, Stephen H. Schnieder, Cynthia Rosenzweig, and Alan Pounds, "Fingerprints of Global warming on Wild Animals and Plants," *Science* 421:2, January 2003, pp. 57-60.

Camille Parmesan and Gary Yohe, "A Globally Coherent Fingerprint of Climate Change Impacts cross Natural Systems," *Science* 421:2, January 2003, pp. 37-42.

Thomas, et al. “Extinction risk from climate change”, *Nature* 427, January 2004, pp. 145-148

TABLE 1

ECCCHCP/NCCP: Identification of Potential Water Quality Impacts and Required Analyses

CAUSE	EFFECT	NEEDED ANALYSES
1. FILL & EXCAVATION Fill or excavation in wetlands, riparian areas, or other waters of the state.	**A. Decreased Flood Storage.** Fill can impinge on the natural storage volume of ephemeral, intermittent, and perennial channels, backwaters, and wetlands, reducing capacity to retain runoff.[1]	1) Quantify reduced flood storage in each affected basin. 2) Identify mitigation.
	B. Change in Groundwater Storage. Fill and excavation can decrease groundwater recharge and cause lower water tables by changing soil percolation characteristics and reducing the area of standing water in recharge basins.[2] Linear excavation (e.g., for utility lines) can act as a conduit to drain groundwater and locally lower watertables.	1) Quantify groundwater response to changes in percolation. 2) Identify locations where linear alignments could act to dewater shallow aquifers. 3) Identify mitigation.
	C. Change in Wetland and Riparian Vegetation. Fill and excavation can bury or remove vegetation and can change site features to prevent reestablishment of characteristic species.	1) Identify and map types and areal extents of affected vegetation. 2) Identify mitigation.
	D. Impaired Beneficial Uses. Fill can directly impair beneficial uses by reducing water area and changing hydrology, geomorphology, substrate, and other waterbody characteristics. In addition, projects which fragment habitat and reduce wildlife movement along riparian and other corridors can degrade remaining patches of wetlands and other habitat by changing their physical characteristics and by isolating and exposing small populations of plants and animals, resulting in local or regional extinctions.[3]	1) Document types, areal extents, and (for drainage features) lengths of affected waters. 2) Characterize and map at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 3) Identify effects of fill on terrestrial and aquatic habitat connectivity (refer to Enclosure 3). 4) Identify watershed-level effects on pollutant removal and flood retention. 5) Identify mitigation.
2A. CONSTRUCTION Clearing, grading, and construction of structures and facilities.	**A. Production of Urban Pollutants.** Construction can produce pollutants through improper use and disposal of toxic construction materials.	1) Identify mitigation for inclusion in stormwater pollution prevention plan.
	B. Change in Soil Erosion. Active construction can dramatically increase soil erosion by exposing and destabilizing soils. Erosion is compounded by the increased runoff typically accompanying construction.[6]	1) Identify location and extent of planned grading. Display proximity and slope relationships to receiving drainages. 2) Document erodibility of soils and subsoils in areas proposed for grading. 3) Quantify amount and duration of increased sediment loadings to each affected drainage. 4) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	C. Increased Runoff. Construction can increase both the total and peak volume of stormwater runoff by removing vegetation, compacting soil, exposing dense subsoil, creating steep graded slopes, and eliminating terrain depressions and ephemeral and intermittent drainages that would naturally slow the movement of stormwater.[9]	1) Quantify total and peak volumes of increased runoff for each affected drainage 2) Identify mitigation.
	D. Impaired Beneficial Uses. Projects which fragment habitat and reduce wildlife movement along riparian and other corridors can degrade remaining patches of wetlands and other habitat by changing their physical characteristics and by isolating and exposing small populations of plants and animals, resulting in local or regional extinctions.[11]	1) Characterize and map at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 2) Identify effects of construction on terrestrial and aquatic habitat connectivity (refer to Enclosure 3). 3) Identify mitigation.
2B. POST-CONSTRUCTION Ongoing effects of constructed environment.	**A. Dry weather discharge.** Construction can cause dry-season “nuisance” runoff from activities such as landscape irrigation[5], sidewalk and vehicle washing, and basement dewatering.	1) Characterize volumes, seasonality, and other pertinent characteristics of "nuisance" flows for each affected drainage.
	B. Increased Groundwater Pumping. Construction can cause increased groundwater pumping for domestic or landscape use.[4]	1) Quantify and map locations of increased pumping.
	C. Production of Urban Pollutants. After construction, urban areas can generate pesticides, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, bacteria, viruses, and other pollutants from activities such as landscape care and vehicle operation and maintenance.[7]	1) Quantify projected increase in pollution production in each affected basin. 2) Identify mitigation.
	D. Change in Soil Erosion. After construction, erosion can be reduced to below natural levels because soils are covered with buildings and pavement, and runoff is routed through storm drains.[8]	1) Quantify reduction of natural sediment delivery rates to each affected basin. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	E. Increased Runoff. After construction, maintained landscapes and impervious surfaces such as roofs and streets increase total and peak runoff. The increased flows move quickly over paved surfaces and are collected, concentrated, and further accelerated in stormdrain systems. The combination of increased flows and more efficient transport causes a higher, “flashy”, more rapidly peaking and falling hydrograph, especially for smaller, more frequent floods.[10]	1) Quantify project-induced changes in total and peak runoff rates to each affected drainage. 2) Identify mitigation.
3. CHANNELIZATION Engineered changes in channel structure or morphology to stabilize banks, prevent flooding, or increase flow conveyance.	**A. Decreased Flood Storage.** Channelization can reduce flood storage within a basin by restricting flows to the active channel, thereby preventing detention of floodwater in backwaters and on the adjacent floodplain.[12]	1) Quantify and map reductions in flood storage in each affected basin. 2) Identify mitigation.
	B. Change in Groundwater Storage. Lining channel bottoms can change groundwater storage by reducing percolation and groundwater recharge.[13] Deepening natural channels can drain adjacent shallow water tables.[14]	1) Quantify and map locations of reduction in recharge rates. 2) Quantify effects on channelization on shallow water tables and associated wetlands. 3) Identify mitigation.
	C. Channel Destabilization. Channelization can cause channel destabilization by changing the balance between the stream’s flow, sediment load, and channel form. Destabilization tends to affect entire stream systems. For example, channelization can concentrate and synchronize peak flows from tributary streams, causing increased channel erosion both above and below the channelized reach. The eroded sediment is then deposited downstream when the flow slows down, where it may initiate further destabilization.[15]	1) Quantify basin-level hydrologic and fluvial geomorphic effects of channelization in each affected drainage. 2) Identify mitigation.
	D. Increased Flooding Frequency. Constricted channels (e.g., in leveed sections) can cause water to back up, resulting in localized upstream flooding. Rapid passage of floodwaters through "improved" channels can increase flooding downstream by concentrating and synchronizing tributary peaks.[16]	1) Quantify basin-level hydrologic effect of channelization on each affected basin, including changes in flood return frequencies. 2) Identify mitigation.
	E. Decreased Pollutant Removal. Channelization can decrease natural pollutant removal by reducing instream structural complexity and turbulent-flow aeration, increasing flow velocity, reducing overbank flow, and by causing change in vegetation.[17]	1) Map waters lost to channelization in each affected drainage and characterize type, areal extent, and pollutant removal value. 2) Quantify affect on pollutant loadings to each affected waterbody and downstream receiving waters. 3) Identify mitigation.
	F. Change in Wetland and Riparian Vegetation. Channelization and associated maintenance can directly destroy wetland and riparian vegetation and can change site features to prevent reestablishment of characteristic species.[18]	1) Map and Identify types and areas of affected vegetation. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	G. Impaired Beneficial Uses. Channelization and associated maintenance can directly impair beneficial uses by reducing waterbody area; increasing stream velocity; disrupting riffle and pool sequences, cover, and other structural features; changing substrate; cutting off nutrient inputs to and from backwaters and riparian wetlands, dewatering upstream reaches, and reducing aesthetic and recreational value. Reduced overbank flooding can adversely affect reproduction of riparian vegetation and wetland and riparian functions.[19] Channelization can inhibit the movement of fish, other aquatic biota, and wildlife, and thus isolate and reduce the viability of populations up and downstream.[20] Construction of channels can introduce sediment, nutrients, and toxics into the water column.[21]	1) Identify direct and indirect effects of proposed channelization projects on beneficial uses. 2) Characterize and display at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 3) Identify effects of channelization on terrestrial and aquatic habitat connectivity. 4) Identify mitigation.
4. DECREASED FLOOD STORAGE	**A. Increased Runoff.** Reduced flood storage on the floodplain and in channels, swales, wetlands, backwaters, and other natural depressions increases and accelerates runoff.[22]	1) Quantify total and peak volumes of increase runoff for each affected drainage. 2) Identify mitigation.
5. INCREASED GROUNDWATER PUMPING	**A. Change in Groundwater Storage.** Increased groundwater pumping can lower watertables locally or in distant donor basins.[23]	1) Quantify and map locations of project-induced changes in groundwater levels. 2) Identify mitigation.
6. DRY WEATHER DISCHARGE	**A. Change in Baseflow.** Dry weather runoff from urban activities can increase dry-period streamflows.[24]	1) Quantify hydrologic effects of dry weather flows on the baseflow of each affected drainage.
	B. Increased Pollutant Delivery. Dry weather runoff can carry the pollutants generated by the activity causing the flow, e.g., pesticides, nutrients, and petrochemicals from landscape maintenance and cleaning sidewalks and vehicles. Collection of polluted dry weather flows in catch basins may result in shock loadings when it is displaced by subsequent storm flows.[25]	1) Quantify and characterize pollutant loadings from activities generating dry weather runoff to each affected drainage. 2) Identify mitigation.
7. PRODUCTION OF URBAN POLLUTANTS	**A. Increased Pollutant Delivery.** Increased production of urban pollutants can cause increased delivery of pollutants to surface and groundwater.[26]	1) Quantify and characterize pollutant loadings from to each affected drainage. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
8. CHANGE IN SOIL EROSION	**A. Channel Destabilization.** Changes in upland soil erosion can destabilize stream channels by changing the amount of sediment carried into the stream. The stream may then erode or aggrade its channel to balance its available energy with the changes in its sediment load. 1. Increased sediment from construction causes channel aggradation, changing stream cross sections and redirecting flows.[27] 2. Decreased sediment from a paved watershed can cause channel incision and/or side-cutting. The effect may be compounded by increased runoff from the paved watershed. Aggradation may occur downstream where the flow slows and deposits the eroded sediment, which may deflect flows against the channel banks and cause further bank erosion.[28]	1) Conduct geomorphologic analysis of channel response to increases in construction-related sediment. 2) Conduct geomorphologic analysis of channel response to long-term reductions in sediment delivery to each affected drainage. 3) Identify mitigation. Note: Sediment as a pollutant is considered in No. 7, "Production of Urban Pollutants".
9. INCREASED RUNOFF	**A. Change in Soil Erosion.** Increased runoff can dramatically increase soil erosion by causing greater runoff velocities which more effectively displace and carry soil particles. Construction-related soil destabilization can compound the effect.[29]	1) Quantify increases in sheet and gully erosion resulting from increased runoff. 2) Identify mitigation.
	B. Change in Groundwater Storage. Increased runoff can reduce groundwater recharge and lower water tables, since water draining from impervious surface is unable to percolate to groundwater at that location.[30]	1) Map locations of and quantify losses of recharge and water table response. 2) Identify mitigation.
	C. Channel Destabilization. Increased peak runoff can destabilize channels by increasing the flow velocity and erosive power of the stream. Head cutting, incision and/or widening of the channel, and associated sideslope failures can result. Reduced sediment input as a result of change in soil erosion rates can compound the effect.[31] In small streams, increased runoff may also dislodge logs and other channel features that help to define the channel.[32]	1) Quantify channel geomorphic response to increased runoff for each affected drainage. 2) Identify mitigation.
	D. Increased Pollutant Delivery. Increased runoff increases pollutant delivery because it can more effectively carry particulate and soluble pollutants to receiving waters. Increased flow velocity reduces contact time with soil and vegetation that might otherwise remove pollutants.[33]	1) Quantify types and quantities of increased pollutant loadings to each affected drainage. 2) Identify mitigation.
	E. Increased Flooding Frequency Increased runoff and greater transport efficiency result in higher peak flows from storms of a given return period.[34]	1) Quantify basin level hydrologic effect of increased runoff on each affected basin, including changes in flood return frequencies. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	F. Change in Water Temperature. Increased runoff from urban areas can raise the temperature of receiving waters because runoff from impervious surfaces is often warmer than runoff from pervious surfaces or subsurface flow.[35]	1) Model increase in water temperature along stream profile of each affected drainage. 2) Identify mitigation.
	G. Impaired Beneficial Uses. Increased runoff can impair habitat values by flushing fish and invertebrates out of streams,[36] increasing water level fluctuations and the velocity of flows entering wetlands,[37] and causing salinity changes in estuaries and other nearshore marine waters.[38]	1) Identify direct effects of increased flow on aquatic biota, hydrologic regimes of adjacent wetlands, and salinity of marine receiving waters for each affected drainage. 2) Identify mitigation.
10. CHANGE IN GROUNDWATER STORAGE	**A. Change in Baseflow.** Changes in watertable level can cause changes in the dry weather baseflow of streams fed by groundwater.[39]	1) Quantify for each affected drainage the changes in baseflow associated with lowered water tables and map locations. 2) Identify mitigation.
	B. Change in Wetland and Riparian Vegetation. A lowered watertable can dry up wetlands, stress or kill mature riparian vegetation, and reduce or eliminate seedling survival.[40]	1) Identify types and areas of wetlands and riparian areas that would be affected by expected lowering of shallow water tables and map locations. 2) Identify mitigation.
	C. Impaired Beneficial Uses. A lowered watertable can impair water supply and other beneficial uses which use groundwater. Seawater intrusion is possible in coastal areas.[41] Aquifer compaction and subsidence can also occur.[42] Wetland and riparian areas can be dewatered, harming associated vegetation and habitats.[43]	1) Identify affects of expected water table lowering on water supply and other beneficial uses and map locations. 2) Identify mitigation.
11. CHANNEL DESTABILIZATION	**A. Channelization.** Channel erosion can threaten property and structures, leading to placement of riprap or other engineered stabilization of critical sections.[45]	1) Identify stream reaches in which project-induced channel destabilization may require channelization. 2) Identify mitigation.
	B. Change in Groundwater Storage. Channel incision can dewater shallow aquifers adjacent to the channel.[46]	1) Identify and map stream reaches in which project-induced stream incision may dewater shallow aquifers. 2) Identify mitigation.
	C. Increased Pollutant Delivery. Channel erosion can result in increased suspended solids and turbidity in the water column.[47]	1) Identify and map stream reaches subject to project-induced destabilization, quantify changes in channel dimension, and volume of eroded material for each affected basin. 2) Identify mitigation.
	D. Increased Flooding Frequency. Channel aggradation can cause local flooding by diverting flows and decreasing a stream's flow capacity.[48]	1) Identify and map stream reaches in which project-induced channel destabilization may cause aggradation and associated flooding. 2) Identify mitigation.
	E. Change in Water Temperature. Bank erosion and aggradation can increase water temperature by creating a broader channel with shallow flows, increased water surface relative to flow volume, and a smaller proportion of shaded water surface. As a result, summer water temperatures and daily and seasonal temperature fluctuations tend to be greater.[49]	1) Identify and map stream reaches in which project-induced destabilization can increase water temperature. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	F. Change in Wetland and Riparian Vegetation. Channel destabilization can encroach on riparian wetlands and undermine streamside vegetation.[50]	1) Identify, characterize, and map wetland and riparian areas subject to encroachment by channel destabilization; . 2) Identify mitigation.
	G. Impaired Beneficial Uses. Channel destabilization can reduce or eliminate habitat, recreation, esthetic values, and other uses by affecting deep pools, pool-riffle ratios, undercut banks, substrate suitability, and other structural features.[51]	1) Identify, characterize, and map stream reaches in which channel destabilization can directly impair beneficial uses. 2) Identify mitigation.
	H. Increased Maintenance and Property Damage. Channel erosion can undermine streamside buildings, bridges, utility crossings, and other property. Aggradation can bury diversion structures and other infrastructure and may require removal to maintain flow capacity.	1) Identify and map stream reaches in which destabilization may cause increased maintenance and property damage. 2) Identify mitigation.
12. CHANGE IN BASEFLOW	**A. Change in Groundwater Storage.** Reduced stream baseflow can decrease groundwater recharge by reducing wetted area and the amount of water available for recharge in stream channels.[52]	1) Identify and map affected stream reaches. 2) Quantify losses of recharge and water table response. 3) Identify mitigation.
	B. Change in Water Temperature. Decreased baseflow, typically resulting from change in groundwater storage, can cause elevated and fluctuating stream temperature because groundwater usually enters the stream at cool, stable temperatures.[53]	1) Identify and map affected stream reaches; 2) Quantify temperature effects along stream profile. 3) Identify mitigation.
	C. Change in Wetland and Riparian Vegetation Decreased stream baseflow can cause riparian vegetation to shift to upland species.[54]	1) Characterize and map affected riparian areas. 2) Identify mitigation.
	D. Impaired Beneficial Uses. 1. Decreases in the amount or duration of baseflow can impair habitat quality by eliminating aquatic and riparian habitat area, reducing flow velocities, and otherwise disrupting the life cycles of plants and animals which are dependent on water.[55] 2. Increases in baseflow resulting from dry weather discharge can impair waterbodies such as seasonal wetlands, vernal pools, and intermittent streams which are naturally defined by seasonal water availability.	1) Identify and map affected waterbody segments. 2) Characterize and quantify changes in baseflow. 3) Identify direct effects on beneficial uses 4) Identify mitigation.
13. INCREASED POLLUTANT DELIVERY	**A. Impaired Beneficial Uses.** Urban pollutants can impair many beneficial uses, e.g., water supply, recreation, fish and wildlife habitat, and shellfish production.[56]	1) Identify direct effects of increased pollutant loadings on beneficial uses in each affected waterbody segment. 2) Identify mitigation.
14. INCREASED FLOODING FREQUENCY	**A. Channelization.** Increased flooding can lead to channelization of the critical section to more efficiently pass flood flows.[57]	1) Identify stream reaches in which project-induced flooding may require channelization. 2) Identify mitigation.

CAUSE	EFFECT	NEEDED ANALYSES
	B. Impaired Beneficial Uses. Increased flooding can impair habitat,[58] water supplies, navigation, and other beneficial uses.	1) Identify stream reaches in which project-induced flooding may impair beneficial uses. 2) Identify mitigation.
	C. Increased Maintenance and Property Damage. Increased flood frequency can result in more maintenance and flood damage.	1) Identify stream reaches in which project-induced flooding may increase maintenance and property damage. 2) Identify mitigation.
15. INCREASED WATER TEMPERATURE	**A. Impaired Beneficial Uses.** Increased water temperature can directly stress aquatic biota and can also affect other parameters associated with habitat quality, such as dissolved oxygen concentration and rate of chemical reactions.[59]	1) Identify and map affected waterbody segments. 2) Quantify temperature changes. 3) Characterize effects on beneficial uses. 4) Identify mitigation.
16. DECREASED POLLUTANT REMOVAL	**A. Increased Pollutant Delivery.** Less removal of pollutants by natural processes can result in greater concentrations of pollutants in receiving waters.[60]	1) Quantify effects to pollutant loadings for each affected waterbody. 2) Identify mitigation.
17. CHANGE IN WETLAND AND RIPARIAN VEGETATION	**A. Channel Destabilization.** Loss of vegetation and its associated anchoring root masses can destabilize channel banks and other geomorphic features.[61]	1) Characterize and map affected geomorphic features. 2) Identify mitigation.
	B. Change in Water Temperature. Loss of riparian vegetation can increase maximum water temperature by exposing more water surface to the sun. Daily and seasonal temperature fluctuations also tend to be greater.[62]	1) Identify and map stream reaches in which loss of riparian vegetation can increase water temperature. 2) Identify mitigation.
	C. Decreased Pollutant Removal. Removal of vegetation adjacent to a waterbody can reduce removal of pollutants from the waterbody and from the overland flow draining to the waterbody.[63]	1) Describe type, areal extent, and pollutant removal value of affected vegetation and map location. 2) Identify mitigation.
	D. Impaired Beneficial Uses. Loss of vegetation directly impairs the quality of aquatic and riparian habitat by reducing cover, structural diversity, and nutrient sources.[64] Removal of vegetation can also fragment and isolate remaining patches of habitat, resulting in decreased habitat value over large areas.[65]	1) Identify affected waterbody segments. 2) Characterize direct effects of vegetation loss on beneficial uses. 3) Characterize and display at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 4) Identify effects of vegetation change on terrestrial and aquatic habitat connectivity. 5) Identify mitigation.

Response to Letter O, from the State Water Resources Control Board

For the commenter's and the reader's references, three tables are provided at the end of this response that provide supporting detail to the responses below. Table O-1 summarizes the discussion of water quality throughout the HCP/NCCP and the EIS/EIR. Table O-2 summarizes the analysis of water quality effects of covered activities. Table O-3 summarizes the key conservation measures included in the HCP/NCCP for mitigation of water quality effects.

Response to Comment O-1

In response to the draft EIS/EIR, the commenter states that the document does not address the water quality effects of specific dredge and fill discharges associated with future urban development and does not describe a proposed streamlined permitting process for discharges.

Water Quality Effects of Covered Activities and the HCP/NCCP

The water quality effects of the HCP/NCCP as a whole are disclosed in various locations in the HCP/NCCP and in the EIS/EIR (see Table O-1), but the SWRCB is correct that Section 4.6 of the EIS/EIR does not explicitly discuss the water quality impacts of covered activities in a focused, explicit manner. The draft HCP/NCCP and draft EIS/EIR did assess the effects of covered activities on aquatic resources (streams, wetlands, and ponds) and water quality as evidenced in the HCP/NCCP (see p. 4-2, 4-3, 4-5, 4-11, Table 4-1, Table 4-2, Table 4-3, and Table 4-8 and Appendix K) and p. 4-8 to 4-9 of the EIS/EIR (see Impacts BIO-5 and BIO-6 on p. 4-8 and 4-9) and provided specific mitigation for these effects in the HCP/NCCP (see Table O-3 and Conservation Measures 1.7 (p. 6-), 1.10 (p. 6-), 2.2 (p. 5-72), 2.3 (p. 5-76), and 2.12 (p. 6-27) in particular). The draft EIS/EIR incorporated the analysis of the impact of urban development on water resources and water quality found in the EIRs for the local general plans as noted in Section 4.6.1 on p. 4-43.

The Final EIS/EIR includes revisions that describe the water quality effects of HCP/NCCP implementation for covered activities. By comparison to the current permitting regime wherein landscape and watershed-level considerations are rarely evaluated, much less mitigated for, the HCP/NCCP will provide for landscape-level and watershed-level conservation measures that are likely to result in better water quality conditions overall for the following reasons:

- Hydrology and water quality were a key consideration in the development of the HCP/NCCP as a whole as shown by the conservation strategy and by the incorporation of key water quality conservation measures (particularly 1.7, 1.10, and 2.12)
- On a landscape level, the plan provides a means to preserve higher quality/higher function aquatic resources.
- On a landscape level, the plan focuses development mostly within areas of lower quality/lower function aquatic resources.
- On a landscape level, the plan will result in greater protection and enhancement of beneficial uses than the current project-by-project approach.

Streamlined Permit Process

The regional permitting effort has been operating in parallel and in support of the HCP/NCCP. The intent of this effort is adequately disclosed within the draft HCP/NCCP (p. ES-1, p. 1-14 to 1-18, 3-34 to 3-37) and the draft EIS/EIR (p. 1-6 to 1-8 and 2-15). The intent is best summarized as adoption of a streamlined permit program wherein consistent permit conditions, especially as they relate to wetlands, other aquatic resources, habitats, and species, can be established by the Corps, CDFG, and the SWRCB/RWQCBs within the permit area. By doing so, there would be an efficiency of permit processing for covered activities that would be of benefit to the regulated community, the participating jurisdictions, and the permitting agencies and a coordinated mitigation approach that would be of benefit to water quality, aquatic resources, and covered species.

The HCPA is seeking the support of the SWRCB of a streamline permit program for the HCP/NCCP project area. This program would establish the processing steps, requirements, and adopted mitigation measure agreed to by all three wetland-permitting agencies. Ideally, there would be consistent mitigation for the issues at the heart of the HCP/NCCP, that is mitigation for habitat, species, and aquatic resources (including wetlands, streams, ponds, and sloughs). While the HCP/NCCP as a whole would result in significant water quality benefits by comparison to the current project by project permitting approach (see discussion above), it is intended that the permit program will leave ultimate water quality determinations to a project-by-project and case-by-case approach for the RWQCBs. Thus, the EIS/EIR (as well as the SWRCB) should not be required by CEQA to consider water quality impacts at a project-level detail because the potential permit program will not forego such project-level consideration. This means that a landscape level analysis of the water quality effects of the program as a whole should be appropriate under CEQA for the adoption of the permit program as a whole by the SWRCB.

Revisions to the EIS/EIR

The Final EIS/EIR includes revisions that provide a more focused, explicit discussion of the potential water quality effects of covered activities at a landscape level (Chapter 4, Section 4.6). Effects on water resources have been quantified on a subbasin level.

Response to Comment O-2

In response to the draft EIS/EIR, the commenter states that the SWRCB can consider certification of discharges analyzed in the Final EIS/EIR and could consider a streamlined permitting process to the extent that significant effects of the process are considered in the Final EIS/EIR, analyzed, and mitigated.

As noted above in comment O-1, the HCPA is not seeking a “blanket” water quality certification to authorize covered activity discharges. Thus, the permit program that SWRCB may choose to adopt will not permit individual discharges in such a way that no further project-level review of water quality effects will be required. The use of the HCP/NCCP EIS/EIR document to evaluate the potential permit program only requires consideration of the broad environmental impacts of adopting the permit program in comparison with the baseline impacts of continued status-quo permitting and not consideration of the project-level discharges. Since the permit program does not forego project-level CEQA review nor 401/WDR permit review regarding water quality, the HCP/NCCP EIS/EIR as revised in the final document, provides adequate description and analysis of broad landscape level effects on water quality (including beneficial uses). SWRCB should be able to rely on the EIS/EIR as an adequate CEQA document for consideration of approval of the regional permit program.

No changes to the EIS/EIR are required.

Response to Comment O-3

In response to the HCP/NCCP, the commenter requests additional information to understand how the HCP/NCCP will avoid or minimize each potential cause of water quality degradation, what effects will remain unmitigated, and the magnitude of remaining effects. Commenter suggest modeling and quantification as appropriate. This information is requested to support SWRCB's fulfillment of their statutory responsibilities.

As noted by the SWRCB on p-3 of their comment letter, "avoidance or minimization of any causal link will obviate or reduce subsequent effects and needed analyses, and a relatively small number of key variables mediate most of the pathways causing water quality degradation." The HCP/NCCP and EIS/EIR authors agree with this statement. It is for this reason that substantive avoidance and minimization measures (such as Conservation Measures 1.7, 1.10, and 2.12) are included in the project.

As noted in response to Comment O-1, the Final EIS/EIR includes revisions that provide a more focused, explicit discussion of the potential water quality effects of covered activities at a landscape level. The Final EIS/EIR includes revisions that describe the water quality effects of covered activities and the mitigation provided by HCP/NCCP regarding water quality. The conclusion of the revised analysis is that in comparison to the current permitting regime wherein landscape and watershed-level considerations are rarely evaluated, much less mitigated for, the HCP/NCCP will provide for landscape-level and watershed-level conservation measures that are likely to result in better water quality conditions overall. As noted above, project-level analysis utilizing modeling to quantify specific project-level water quality effects is not warranted nor necessary to support this conclusion on a landscape-level. Project level CEQA and permit review will be able to provide site-specific water quality detail. The HCP/NCCP requires substantive protections for water quality in covered activity project design that will go a long way toward protection of water quality on a project-level basis. However, neither the HCP/NCCP nor the streamlined permit process precludes the potential addition of site-specific conditions for the protection of water quality. It is expected that water quality project permitting will take into account all of the HCP/NCCP measures and thus will not impose additional wetland, habitat, or covered species mitigation requirements.

Revisions to the EIS/EIR

See response to comment O-1 above.

Response to Comment O-4

In response to the HCP/NCCP, the commenter requests specific information on the identification of affected waters as discussed below:

- *Map of affected waters* - A map of watersheds, streams, and drainages in the inventory area is provided as Figure 3-2 in the HCP/NCCP at the end of Chapter 3. Aquatic resources are also mapped by subbasin in Appendix K of the HCP/NCCP (see Figures 5-1a, 5-2a, 5-3a, 5-4a, 5-5a, 5-6a, 5-7a, 5-8a, 5-10a, 5-11a, 5-12a, 5-13a, 5-14a, 5-15a).
- *List of state waters, including riparian areas by waterbody type, subbasin and RWQCB jurisdiction* - See Appendix A to Appendix K in the HCP/NCCP, which includes an inventory

of the waters of the United States. This inventory includes most of the state waters, but does not include “isolated” waters (see discussion below). The inventory in the draft inventory was not separated by RWQCB jurisdiction but is separated by subbasin, which provides for easy identification of resources within the two regional board areas. The following subbasins are within the San Francisco RWQCB jurisdiction: Upper Mount Diablo Creek subbasin and the Willow Creek subbasin. The remaining subbasins are all within the Central Valley RWQCB jurisdiction.

- *Affected acreage and linear feet by waterbody, type and totals by RWQCB jurisdiction and project* - A new table has been added to Appendix K that provides affected acreage by wetland type by subbasin, RWQCB jurisdiction, and total. Affected acreage by individual waterbody is not presented in this table, but was estimated by assuming loss of aquatic resources within the development area and conservation within the medium and high priority conservation areas. This analysis does not take into account “isolated” wetlands (see discussion below)
- *Identification of “isolated” waters* - As described on p. 4-2 of the HCP/NCCP and Appendix K of the draft HCP/NCCP, p. 2-3, the landscape level mapping methodology is unlikely to have captured isolated small wetlands. This is a project-level consideration. The HCP/NCCP will require wetland delineations of all project sites with wetland potential and quantification of effects and application of established mitigation.

Revisions to the HCP/NCCP

Appendix K includes a new table that provides affected acreage by wetland type by subbasin, RWQCB jurisdiction, and total.

Response to Comment O-5

In response to the EIS/EIR, the commenter requests provision of an alternatives analysis in accordance with Clean Water Act Section 404 (b) (1) guidelines and notes that the guidelines principals of avoidance are directly relevant to the SWRCB and RWQCB's mandate to protect water quality.

The requirements for alternatives analysis for an EIS and EIR are those provided in NEPA (40 CFR 1502.12[a] and Forty Question No.1[a], see discussion on p. 2-2 of the EIS/EIR) and CEQA (CEQA Guidelines Section 15126[d][2] and discussion on p. 2-2 of the EIS/EIR). Neither NEPA nor CEQA require an alternatives analysis to be conducted in accordance with the CWA Section 404(b)(1) guidelines.

The Section 404(b)(1) guidelines require an alternatives analysis to be conducted in regards to individual permit applications that are submitted to the U.S. Army Corps of Engineers. This is a permitting feature of compliance with the Clean Water Act. Compliance with the 404(b)(1) guidelines may be necessary as part of the regional permitting effort with the Corps. If so, that process will include a public notice that will be provided to the SWRCB and the involved RWQCBs, among other agencies, that will be able to review the 404(b)(1) alternatives evaluation, if determined necessary by the Corps.

EPA’s Guidelines (Section 404[b][1] Guidelines) prohibit discharges of dredged or fill material into waters of the United States if there is a practicable alternative to the proposed discharge that would have less adverse impacts on the aquatic ecosystem, provided the alternative does not have other significant adverse environmental consequences (40 CFR 230.10[a]). Under the Guidelines, an alternative is considered “practicable” if it is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the project purpose” (40 CFR 230.10[a][2]). The 404(b)(1) guidelines require identification of the least environmentally damaging practicable alternative (LEDPA).

Alternatives analyzed for the EIS/EIR are presented in Chapter 2 of the EIS/EIS and include a reduced development area alternative and a No-Project/No Action alternative. Both of these alternatives would result in greater avoidance of impacts on aquatic resources than the proposed project. Neither is considered practicable as neither would allow the participating jurisdictions to implement development generally consistent with the adopted general plans. The EIS/EIR also considered a no-take alternative, and a ”modified growth model” alternative, both of which could have lesser impacts to covered species and aquatic resources than the proposed project. Both of these alternatives were dismissed from further consideration because they would not allow development to occur that is generally consistent with adopted general plans.

While alternatives can be considered that more substantially modify the existing general plans, it should be noted that the proposed project does not propose that development result in impacts to aquatic resources wherever it is so designated in the existing general plans. Rather, the HCP/NCCP includes substantial conservation measures (such as 1.7, 1.10, and 2.12) that require avoidance and minimization of impacts on aquatic resources prior to consideration of compensatory mitigation. This application of avoidance and minimization measures is consistent with the 404(b)(1) guidelines. Given the conservation measures, the overall approach to conserving high quality/high function aquatic resources, the focusing of impact in the area of lower quality/lower function aquatic resources while allowing for development in accordance with adopted general plans, it is expected that the project will ultimately determined to meet the 404(b)(1) guidelines.

No revisions to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-6

In response to the EIS/EIR, the commenter request inclusion of measures to maintain the pre-project hydrograph in the alternatives analysis.

Conservation Measure 1.10 describes the C.3 provisions that apply to the permit area in Contra Costa County. The C.3 provisions include the development of and implementation of a hydrograph modification management plan. Thus, this suggestion is already incorporated into the HCP/NCCP and additional alternatives analysis is not required.

No changes to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-7

In response to the EIS/EIR, the commenter requests documentation of potential cumulative impacts to watershed hydrology from existing and other planned development in the HCP/NCCP area.

As noted in response to Comment O-1, the final EIS/EIR includes a landscape level analysis of the impacts of covered activities on water quality. This analysis includes the effect of existing and future development within the planned area. Given that the covered activities include general plan buildout, infrastructure projects, and flood control projects, this assessment provides a reasonable assessment of cumulative impacts. The cumulative impact analysis in Chapter 5 of the EIS/EIR analyzes the impact of other development outside of the covered species.

No changes to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-8

The commenter notes that maintenance of the pre-project hydrograph will prevent or minimize other problems and thus will limit the need for other analyses and mitigation to be included in the EIS/EIR.

As noted in the response to Comment O-7, the HCP/NCCP already includes hydrograph management as part of Conservation Measure 1.10. Due to the inclusion of Conservation Measures 1.7, 1.10, and 2.12, as well as other measures, the EIS/EIR preparers concur that this limits the need for other analyses and mitigation to be included in the document.

No changes to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-9

In response to the EIS/EIR, the commenter requests inclusion of low-impact development measures in the mitigation/alternatives section of the EIS/EIR including maintain natural drainage paths, reducing impervious cover, and managing runoff as close to the source as possible

The HCP/NCCP includes many low-impact measures. Maintaining natural drainage paths will be provided through the requirements of Conservation Measure 2.12 and Conservation Measure 1.7. Conservation Measure will also reduce impervious cover near streams. Reducing impervious cover and managing runoff close to the source may be means that developers use to comply with Conservation Measure 1.10, however the application of this measure will need to be on a case-by-case basis. Conservation Measure 1.10 establishes the performance standard for management of hydrologic and erosional change; the specific site-by-site measures will be established through project-level site planning, CEQA compliance, and permitting.

No changes to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-10

In response to the EIS/EIR, the commenter describes that development may eliminate natural pollutant removal and floodwater retention functions of filled wetlands, riparian areas or streams and requests characterization of the loss of these functions, quantification of the direct and indirect impacts, and description of mitigation measures.

As noted above in response to comment O-1, additional analysis has been added to the Final EIS/EIR regarding the water quality effects of covered activities and the mitigation value of HCP/NCCP conservation measures and conservation strategy. Direct impacts on aquatic resources were quantified in terms of loss and preservation of stream, pond, and wetland area in the Final HCP/NCCP in Appendix K. The mitigation for the impact of covered activities is the HCP/NCCP as a whole. At a landscape level, additional mitigation is not identified as the program as a whole is expected to result in better quality than the No Project Alternative.

No changes to the HCP/NCCP or EIS/EIR are required.

Response to Comment O-11

The commenter asserts that the EIS/EIR does not analyze the potential loss of corridor values in the area proposed for development and requests the analysis of the regional importance of movement corridors in and along riparian areas and other water bodies in the HCP/NCCP, impacts to these corridors and potential for enhancement as project mitigation.

One of the biological natural community goals of the HCP/NCCP (see HCP/NCCP p. 5-8) is to “maintain and enhance instream aquatic habitat for covered species and native fish.” One of the guidelines for managing streams and riparian woodland/scrub as part of Conservation Measure 2.9 (see HCP/NCCP p. 5-95) is to “remove and/or modify barriers (e.g., culverts, low-flow crossings, diversion structures) to up- and downstream fish migration as long as nonnative species (e.g., bullfrogs, exotic fish) do not benefit.”

Riparian corridors were assessed in terms of aquatic resources and specifically their value for covered species. The resources along the riparian corridors were inventoried in HCP/NCCP Appendix K and impacts and benefits have been quantified in the Final EIS/EIR.

Regarding migration along stream corridors, this is considered in the HCP/NCCP in regards to covered species. For example, HCP/NCCP Tables 4-4 and 4-5 (at end of Chapter 4) shows the analysis of movement habitat for giant garter snake, California red-legged frog, foothill yellow-legged frog, and western pond turtle in the inventory area. Conservation Measure 1.7 (see p. 6-13) specifically notes the value of stream corridors for native fish populations and as a viable wildlife corridor. Conservation Measure 1.14 (see p. 6-22) includes design requirement for covered roads outside the ULL to provide for bridges and culverts that can accommodate wildlife movement along stream corridors.

Revisions to the EIS/EIR

See response to comment O-1 above.

Table O-1. ECCC HCP/NCCP and EIR/EIS Guide to Discussion of Water Quality Effects and Mitigation

Document	Section	Page	Subject	Discussion	Conclusion
HCP	Executive Summary	Es-7	Wetland impact fees	Plan provides for coordinated wetland mitigation approach that will provide for better retention of high quality wetlands within contiguous natural land covers than current project-by-project mitigation approach.	On a landscape level, wetland losses will be mitigated quantitatively and qualitatively.
HCP	Section 1.1.2	1-2	Purpose	HCP is also basis of applications for regional wetland permits.	Framework of regional permitting is disclosed.
HCP	Section 1.3.5	1-14 to 1-18	Wetland laws and regulations	HCP presents overview of Corps, CDFG, and RWQCB permit authorities and describes five key permit provisions.	Framework of regional permitting is disclosed.
HCP	Section 2.3	2-25 to 2-34	Covered Activities	Description of covered activities provided including urban development, rural infrastructure, flood protection, etc.	While specific discharges not identified, general character of discharges can be inferred by description of covered activities provided.
HCP	Section 3.3.1	3-7	Hydrology	Overview of project area hydrology provided.	Landscape level hydrologic functions are recognized.
HCP	Section 3.3.2	3-14 to 3-20	Riparian, Wetlands, Ponds, and Streams	Description of project area aquatic resources is provided, including riparian areas, wetlands, streams, reservoirs, ponds, sloughs and channels.	Resources are inventoried for project area.
HCP	Section 3.3.3	3-27	Historic Conditions	Overview of historic conditions provided for streams and wetlands and riparian forests.	Historic conditions understood.
HCP	Section 3.3.4	3-31 to 3-33	Natural Communities	Describes community structure and function for riparian woodland/scrub, streams, and wetlands	Functions and values considered by plan.
HCP	Section 3.3.5	3-34 to 3-37	Regulatory Context	Regulatory context of wetlands, streams, and other waters is described/	Regulatory framework is recognized.
HCP	Tables 3-3, 3-5, 3-6, Figures 3.2, 3.3	End of Section 3	Inventory	Inventory of Aquatic resources and jurisdictional areas,. Mapping of watershed, streams, and drainages	Aquatic resources inventoried for project area and jurisdictional areas identified for project area.

Document	Section	Page	Subject	Discussion	Conclusion
HCP	Section 4.1.2	4-2	Approach to Wetlands and Streams	Describes impact assessment for wetlands and streams within permit area.	Impacts of covered activities on wetlands and streams has been assessed.
HCP	Section 4.2.1	4-3 to 4-4	Urban Development	Describes various impacts including increased runoff, urban pollutants, and increase in impermeable surfaces.	Broad water quality effects considered in HCP impact analysis.
HCP	Section 4.2.2	4-5 to 4-6	Rural Infrastructure	Water quality is one of the effects noted.	Broad water quality effects considered in HCP impact analysis.
HCP	Section 4.3	4-11	Effects on Natural Communities, Wetlands, and Streams	Describe effect levels and notes that initial GIS estimates vastly overestimated potential impacts to streams. Describes adopted caps on amount of stream effects.	Limitations on overall impacts to streams adopted to minimize impact within project area.
HCP	Table 4-1	End of Section 4	Indirect Effects	Increased urban runoff of urban pollutants identified as effect of covered activties	Urban runoff considered as effect.
HCP	Tables 4-2 and 4-3	End of Section 4	Effects on Aquatic Resources	Quantification of direct impacts on wetlands, ponds, streams and riparian comjunities for the IUDA and the MUDA.	Potential effects have been quantified.
HCP	Table 4-8	End of Section 4	Antioch	Quantification of direct impacts on wetlands, ponds, streams and riparian comjunities for the City of Antioch Urban Development.	Potential effects have been quantified.
HCP	Section 5.2.1 and 5.2.3	5-3 and 5-22	Conservation Strategy	Strategy designed to meet regulatory requirements of CWA Sections 404 and 401 and CDFG Code 1602 and to provide mitigation for loss of functions resulting from impacts on waters of the United States and waters of the state.	Project overall intent is disclosed.
HCP	Section 5.2.2	5-6 to -5-8	Goals	Goals are outlined for wetlands and ponds, and riparian woodland/scrub that includes preservation, maintenance, and enhancement of aquatic habitat functions as well as maintenance an enhancement of hydro-geomorphic functions.	Beneficial uses of aquatic resources considered in development of plan.
HCP	Section 5.3.1	5-25 to 5-28	Cons. Measure 1.1	Identifies land acquisiition requirements for wetlands, ponds, streams, and riparian woodland/scrub; describes avoidance, minimization, compensation approach; described impacts to streams; notes importance of hydrologic function.	Beneficial uses of aquatic resources considered in development of plan.

Document	Section	Page	Subject	Discussion	Conclusion
HCP	Section 5.3.1	5-58 to 5-59	Cons. Measure 1.2	Preserve management will be conducted allowing for enhancement of streams, ponds, and wetlands.	Overview of various elements of preserve management.
HCP	Section 5.3.1	5-61	Cons. Measure 1.3	Allows opportunities for riparian woodland/scrub restoration along creeks	Provides for enhancement of riparian areas.
HCP	Section 5.3.2	5-69 to 5-72	Cons. Measure 2.1	Enhancement, restoration, and creation of riparian woodland/scrub, wetlands, ponds, and streams provided.	Key mitigation approach for impacts of covered activities.
HCP	Section 5.3.2	5-72 to 5-76	Cons. Measure 2.2	Wetlands and ponds within preserves will be managed to increas ehydrogeological functions with goals that include increased reduction of sediment deposition and transport, maintenance or increase of capacity and duration, and enhanced connectivity. Management considerations include consideration of existing incision, channel stablization , and floodplain connections, removal of unnecesary fulfill to enhance hydroloigic functions, culvert retrofti/repari.	Measure ensures that preserved aquatic resources will be enhanced in wide range of functions to offset effects of covered activities to affected resources.
HCP	Section 5.3.2	5-76 to 5-80	Cons. Measure 2.3	Restoration of wetlands and creation of ponds will be conducted to provide a net increase of wetland and pond area, functions, and values in the inventory area.	Measure ensures that created/restored aquatic resources will more than offset effects of covered activities to affected resources including beneficial uses.
HCP	Section 5.3.2	5-94 to 5-97	Cons. Measure 2.9	Enhancement of degraded streams and riparian woodland/scrub includes goals of maintaining/increasing connectivity, reducing water temperatures and variation, reduce sediment imput and downstream transport. Management consideration include invision, channel stabliziation, and floodplain connections.	Stream functions and values would be enhanced including water quality beneficial uses.
HCP	Section 5.3.2	5-97 to 5-100	Cons. Measure 2.10	Restoration of streams and riparian woodland/scrub includes goals of maintaining/increasing connectivity, reducing water temperatures and variation, reducing sediment imput and downstream transport.	Stream functions and values would be increased including water quality beneficial uses.
HCP	Tables 5-3	End of Section 5	Land Cover	Provides totals for aquatic resources land cover.	Baseline information covered.
HCP	Tables 5-5a and 5-5b	End of Section 5	Preservation Ratios	Preservation totals for aquatic resources.	Mitigation measure described.

Document	Section	Page	Subject	Discussion	Conclusion
HCP	Tables 5-17 and 5-17	End of Section 5	Restoration	Restoration and creation requirements for aquatic resources	Mitigation measure described.
HCP	Section 6.2.1	6-7	Jurisdictional Waters	Describes how impacts to waters will be quantified and mitigated on project-level basis.	Mitigation measure described.
HCP	Section 6.3.1	6-10	Cons. Measure 1.6	Describes how development footprint adjacent to open space is to be minimized.	Mitigation measure described.
HCP	Section 6.3.1	6-11 to 6-13	Cons. Measure 1.7	Describes minimum setbacks to be provided for covered activities. These setbacks meet and in some cases exceed the existing requirements of cities and the County. Describes that the purpose of the setback requirement includes: maintenance and improvement of water quality by filtering of sediments and pollutants; protection of riparian aras and habitat; and maximize natural flood protection value of the floodplain; among other measures.	Key mitigation approach for impacts of covered activities.
HCP	Section 6.3.1	6-16 to 6-18	Cons. Measure 1.10	Describes measures to maintain and improve hydrologic conditions and minimize erosion. Conservation measure extend the C.3 Provision to eastern Contra Costa County. Notes hydrologic benefit of implementation of this measure along with stream setbacks.	Key mitigation approach for impacts of covered activities.
HCP	Section 6.3.1	6-20 to 6-21	Cons. Measure 1.12	Describes BMPs for rural road maintenance including sediment controls, control of erodible materials,and limitation on herbcide and pesticide use.	Mitigation measure described.
HCP	Section 6.3.1	6-21 to 6-22	Cons. Measure 1.13	Describes BMPs for flood control facility maintenance including sediment controls, control of erodible materials, use of settling basins, and spill prevention and control.	Mitigation measure described.
HCP	Section 6.3.1	6-27 to 6-29	Cons. Measure 2.12	Describes avoidance and minimization measures for covered activities relative to wetlands, ponds, and streams. Avoidance required for projects with more than 3.0 acres of wetland/pond effect (may be altered in final). Site-specific avoidance and minizationr equired for impacts to ANY length of stream of any type. Buffers, fencing, construction controls, spill prevention, erosion control, and herbicide application controls among other measures are included.	Key mitigation approach for impacts of covered activities.

Document	Section	Page	Subject	Discussion	Conclusion
HCP	Tables 6-2, 6-3, 6-4	End of Section 6	Stream Setbacks	Describes specific setback requirements, literature references, and regulatory guidance for riparian and stream setbacks and function.	Key mitigation approach for impacts of covered activities.
HCP	Section 8.2.4	8-4	Plan Implementation	If regional wetland permits approved, then RWQCBs would be advisory members to the HCP governing board and the Technical Advisory Committee	Implementation details.
HCP	Section 10.2.1	10-6 to 10-7	Ponds and Wetlands	Provides that any failure of a pond or wetland control structure for a plan pond or wetland will require remedial action.	Implementation details.
HCP	Volume II Appendix K	Appendix K, Chapters 1 through 5	Aquatic Resource Inventory	Provides detailed hydrogeomorphic setting, describes waters types, analyzes resources and management opportunities by subbasin. Functions and values are analyzed by sub-basin. In specific, Appendix K identifies the habitat, hydrology, and water quality (see 5-5, 5-10, 5-17, 5-22, 5-27, 5-32, 5-38, 5-43, 5-48, 5-53, 5-58, 5-62, 5-66, 5-70, and 5-75) functions of inventoried waters and the overall functional value of same. Management considerations are presented by sub-basin that can be incorporated into site-specific planning, permits, and operations. Subbasin mapping of drainages provided at end of Chapter 5.	Detailed analysis of wetland types and functions affected by covered activities and benefitted by HCP/NCCP implementation.
HCP	Volume II Appendix K	Appendix K, Chapter 6	Aquatic Resources - Impacts	Summarizes impact analysis based on planning scenario.	Impact analysis of covered activities re: aquatic resources.
EIR/EIS	Section 1.2.1	1-6	Purpose (NEPA)	Purpose includes compliance with other federal laws and regulations.	Implies compliance with CWA
EIR/EIS	Section 1.2.3	1-6 to 1-8	Goals and Objectives (CEQA)	Goals and objectives include coordination and standardization of mitigation and compensation of applicable laws and regulations and support for issuand of a regional water quality certification.	Disclosure of goals to include regional permitting.
EIR/EIS	Section 2.2.2	2-15	Conservation of Aquatic and Wetland Resources	HCP/NCCP includes actions subject to Section 401 of the WRA and are analyzed with intent to support CEQA coiverage for issuance of programmatic permits.	Disclosure of goals to include regional permitting.
EIR/EIS	Section 2	Section 2	Alternatives	Alternatives identified	Alternatives per NEPA/CEQA identified.

Document	Section	Page	Subject	Discussion	Conclusion
EIR/EIS	Section 3.2.4	3-17 to 3-22	Aquatic Resources - Baseline	Baseline for assessment of impacts of covered activities to aquatic resources, including wetlands, streams, reservoirs, ponds, and sloughs/channels.	Existing setting disclosed.
EIR/EIS	Section 3.6	3-49 to 3-54	Hydrology and Water Quality	Regulatory and physical setting provided including discussion of CWA Section 401 and Porter-Cologne, surface hydrology, groundwater hydrology, flooding, surface water quality, and groundwater quality.	Existing setting disclosed.
EIR/EIS	Section 4.2.2	4-8 to 4-9	Aquatic Resources - Impacts	Impacts to riparian woodland/scrub, wetlands, ponds, sloughs, and streams quantified. Mitigation measures included in HCP/NCCP discussed.	Impacts to aquatic resources from covered activities identified.
EIR/EIS	Section 4	Section 4	Alternatives analysis	Impacts of alternatives presented.	Alternatives analysis provided.
EIR/EIS	Section 4.6	4-43 to 4-46	Hydrology and Water Quality	Text on p. 4-43 describes that hydrology and water quality impacts of covered activities has been analyzed in CEQA documents for participating jurisdictions and are incorporated by reference and summarized in EIR/EIS Appendix D. Participating jurisdiction CEQA documents conclude that programmatic impacts to water resources can be mitigated to a less-than-significant level through implementation of general plan policies and the adoption of identified mitigation measures Impacts of HCP/NCCP implementation are identified as beneficial concerning long-term drainage patterns and wsurface water quality, groundwater quality, and flooding.	EIR/EIS incorporates prior GP EIR analysis by reference for analysis of impacts of covered activities and identifies net long-term benefits for hydrology and water quality of HCP/NCCP implementation.
EIR/EIS	Section 5.8.2	5-16 to 5-17	E.O. 11990	Describes compliance of plan with E.O. 11990 - Protection of wetlands through adopted conservation measures.	Documents compliance with E.O.
EIR/EIS	Section 6.3.1	6-3 to 6-4	E.O. 11988	Describes compliance of plan with E.O. 11988 - Flood plain management through implementation of city/County GP policies and adopted mitigation. Although not noted in this section, HCP/NCCP implementation would also further flood plain management through Cons. Measure 1-7 concerning stream setbacks and Cons. Measure 1-10 concerning hydrograph alteration management.	Documents compliance with E.O.

Document	Section	Page	Subject	Discussion	Conclusion
EIR/EIS	Section 6.3.2	6-4	E.O 11990	Describes compliance of plan with E.O. 11990 - Protection of wetlands through adopted conservation measures.	Documents compliance with E.O.
EIR/EIS	Appendix D	Appendix D	General Plan EIR summary	Describes impact conclusions and mitigations from County and City General Plan EIRs including those concernign hydrology and water quality.	Programmatic analysis of hydrology and water quality completed for urban and other development compliant with County and City General Plans.

Table O-2. ECCC HCP/NCCP Potential Water Quality Impacts of Covered Activities Preliminary Responses

Cause	Effect	Needed Analyses	Preliminary Response
1. FILL & EXCAVATION Fill or excavation in wetlands, riparian areas, or other waters of the state.	A. Decreased Flood Storage. Fill can impinge on the natural storage volume of ephemeral, intermittent, and perennial channels, backwaters, and wetlands, reducing capacity to retain runoff.[1]	1) Quantify reduced flood storage in each affected basin. 2) Identify mitigation.	HCP/NCCP covered activities must comply with Conservation Measure 1.7 (Stream Setbacks) and Conservation Measure 1.10 (Hydrology and Erosion Control). Through these conditions as well as project-specific measures identified through project-level CEQA permitting and appropriate permit review, fill associated with covered activities will not result in significant decrease in flood storage. Acquisition of preserve land within the upper watershed will allow for infiltration of precipitation through natural land to attenuate potential future buildout runoff.
	B. Change in Groundwater Storage. Fill and excavation can decrease groundwater recharge and cause lower water tables by changing soil percolation characteristics and reducing the area of standing water in recharge basins.[2] Linear excavation (e.g., for utility lines) can act as a conduit to drain groundwater and locally lower watertables.	1) Quantify groundwater response to changes in percolation. 2) Identify locations where linear alignments could act to dewater shallow aquifers. 3) Identify mitigation.	Groundwater storage in upper portions of watershed will be enhanced through preservation activities. While aquifers within urbanized areas are in general not used for water supply, provision of stream setbacks and hydrograph modification management will maintain opportunities for recharge within the covered activity areas. Project-level analysis would address specific groundwater effects of covered activities.
	C. Change in Wetland and Riparian Vegetation. Fill and excavation can bury or remove vegetation and can change site features to prevent reestablishment of characteristic species.	1) Identify and map types and areal extents of affected vegetation. 2) Identify mitigation.	Wetland losses are mitigated through HCP/NCCP Conservation Measures 1.7, 2.2, 2.3, 2,9, 2.10 and 2.12. Extents of impacts are profiled in HCP Table 4-2 and 4-3. Overall, covered activities will not result in net loss of wetlands, ponds or streams. Quantitication of effects and preservation by stream basin is currently in preparation and will be added to the Final EIR/EIS.

Cause	Effect	Needed Analyses	Preliminary Response
	D. Impaired Beneficial Uses. Fill can directly impair beneficial uses by reducing water area and changing hydrology, geomorphology, substrate, and other waterbody characteristics. In addition, projects which fragment habitat and reduce wildlife movement along riparian and other corridors can degrade remaining patches of wetlands and other habitat by changing their physical characteristics and by isolating and exposing small populations of plants and animals, resulting in local or regional extinctions.[3]	1) Document types, areal extents, and (for drainage features) lengths of affected waters. 2) Characterize and map at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 3) Identify effects of fill on terrestrial and aquatic habitat connectivity (refer to Enclosure 3). 4) Identify watershed-level effects on pollutant removal and flood retention. 5) Identify mitigation.	Regarding hydrology, geomorphology, and substrate, the overall effect of the HCP/NCCP is to preserve the most intact upper watershed natural land cover areas while allowing development within the already altered urbanized portions of East County. By comparison with project by project approaches, implementation of the HCP/NCCP will likely alter hydrology, geomprhology, and substrate far less. Regarding wildlife corridors, by providing for stream setbacks across the permit area, implementation will provide for protection of stream/riparian corridors. Quantification of affected waters is currently in preparation and will be added to the Final EIR/EIS. Mapping of wildlands and riparian corridors is presented in HCP Appendix K.
2A. CONSTRUCTION Clearing, grading, and construction of structures and facilities.	A. Production of Urban Pollutants. Construction can produce pollutants through improper use and disposal of toxic construction materials.	1) Identify mitigation for inclusion in stormwater pollution prevention plan.	Stormwater pollution prevention plans (SWPPPs) are already required under Section 402 of the Clean Water Act and would be required for covered activities.
	B. Change in Soil Erosion. Active construction can dramatically increase soil erosion by exposing and destabilizing soils. Erosion is compounded by the increased runoff typically accompanying construction.[6]	1) Identify location and extent of planned grading. Display proximity and slope relationships to receiving drainages. 2) Document erodibility of soils and subsoils in areas proposed for grading. 3) Quantify amount and duration of increased sediment loadings to each affected drainage. 4) Identify mitigation.	Stormwater pollution prevention plans (SWPPPs) are already required under Section 402 of the Clean Water Act and would be required for covered activities. Project-level CEQA analysis and permit review would address construction-period erosion.

Cause	Effect	Needed Analyses	Preliminary Response
	C. Increased Runoff. Construction can increase both the total and peak volume of stormwater runoff by removing vegetation, compacting soil, exposing dense subsoil, creating steep graded slopes, and eliminating terrain depressions and ephemeral and intermittent drainages that would naturally slow the movement of stormwater.[9]	1) Quantify total and peak volumes of increased runoff for each affected drainage 2) Identify mitigation.	Stormwater pollution prevention plans (SWPPPs) are already required under Section 402 of the Clean Water Act and would be required for covered activities. Project-level CEQA analysis and permit review would address construction-period erosion.
	D. Impaired Beneficial Uses. Projects which fragment habitat and reduce wildlife movement along riparian and other corridors can degrade remaining patches of wetlands and other habitat by changing their physical characteristics and by isolating and exposing small populations of plants and animals, resulting in local or regional extinctions.[11]	1) Characterize and map at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 2) Identify effects of construction on terrestrial and aquatic habitat connectivity (refer to Enclosure 3). 3) Identify mitigation.	See 1D above
2B. POST-CONSTRUCTION Ongoing effects of constructed environment.	A. Dry weather discharge. Construction can cause dry-season "nuisance" runoff from activities such as landscape irrigation[5], sidewalk and vehicle washing, and basement dewatering.	1) Characterize volumes, seasonality, and other pertinent characteristics of "nuisance" flows for each affected drainage.	Dry-season flows may occur from covered activities, especially urban development. The HCP/NCCP mitigates this potential through the requirements for stream setbacks and for compliance with the C.3 provisions. Project-level CEQA analysis and permit review would address specific-project runoff impacts.
	B. Increased Groundwater Pumping. Construction can cause increased groundwater pumping for domestic or landscape use.[4]	1) Quantify and map locations of increased pumping.	Groundwater pumping would be addressed inproject-level CEQA and permit review.

Cause	Effect	Needed Analyses	Preliminary Response
	C. Production of Urban Pollutants.After construction, urban areas can generate pesticides, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, bacteria, viruses, and other pollutants from activities such as landscape care and vehicle operation and maintenance.[7]	1) Quantify projected increase in pollution production in each affected basin. 2) Identify mitigation.	Urban development included as a covered activity may result in production of pollutants. The HCP/NCCP mitigates this potential through the requirements for stream setbacks and for compliance with the C.3 provisions. Project-level CEQA analysis and permit review would address specific-project runoff impacts.
	D. Change in Soil Erosion. After construction, erosion can be reduced to below natural levels because soils are covered with buildings and pavement, and runoff is routed through storm drains.[8]	1) Quantify reduction of natural sediment delivery rates to each affected basin. 2) Identify mitigation.	Covered activities could reduce natural sediment delivery. The HCP/NCCP mitigates this potential through the requirements for stream setbacks and for compliance with the C.3 provisions. Project-level CEQA analysis and permit review would address specific-project runoff impacts. HCP/NCCP would provide opportunities to preserve and restore natural sedimentation regimes in the upper watershed.
	E. Increased Runoff. After construction, maintained landscapes and impervious surfaces such as roofs and streets increase total and peak runoff. The increased flows move quickly over paved surfaces and are collected, concentrated, and further accelerated in stormdrain systems. The combination of increased flows and more efficient transport causes a higher, “flashy”, more rapidly peaking and falling hydrograph, especially for smaller, more frequent floods.[10]	1) Quantify project-induced changes in total and peak runoff rates to each affected drainage. 2) Identify mitigation.	Covered activities could increase runoff in local streams. The HCP/NCCP mitigates this potential through the requirements for stream setbacks and for compliance with the C.3 provisions. Project-level CEQA analysis and permit review would address specific-project runoff impacts. HCP/NCCP would provide opportunities to preserve and restore natural hydrology regimes in the upper watershed. Without the HCP/NCCP, there is likely to be more, not less hydrograph modification in the various project sub-basins as a relatively greater amount of development is more likely to occur in the upper watershed.
3. CHANNELIZATION Engineered changes in channel structure or morphology to stabilize banks, prevent flooding, or increase flow conveyance.	A. Decreased Flood Storage. Channelization can reduce flood storage within a basin by restricting flows to the active channel, thereby preventing detention of floodwater in backwaters and on the adjacent floodplain.[12]	1) Quantify and map reductions in flood storage in each affected basin. 2) Identify mitigation.	See 1A above

Cause	Effect	Needed Analyses	Preliminary Response
	B. Change in Groundwater Storage. Lining channel bottoms can change groundwater storage by reducing percolation and groundwater recharge.[13] Deepening natural channels can drain adjacent shallow water tables.[14]	1) Quantify and map locations of reduction in recharge rates. 2) Quantify effects on channelization on shallow water tables and associated wetlands. 3) Identify mitigation.	See 1B above
	C. Channel Destabilization. Channelization can cause channel destabilization by changing the balance between the stream's flow, sediment load, and channel form. Destabilization tends to affect entire stream systems. For example, channelization can concentrate and synchronize peak flows from tributary streams, causing increased channel erosion both above and below the channelized reach. The eroded sediment is then deposited downstream when the flow slows down, where it may initiate further destabilization.[15]	1) Quantify basin-level hydrologic and fluvial geomorphic effects of channelization in each affected drainage. 2) Identify mitigation.	The HCP/NCCP mitigates this potential through the requirements for stream setbacks and for compliance with the C.3 provisions. Project-level CEQA analysis and permit review would address specific-project runoff impacts. And channelization.
	D. Increased Flooding Frequency. Constricted channels (e.g., in leveed sections) can cause water to back up, resulting in localized upstream flooding. Rapid passage of floodwaters through "improved" channels can increase flooding downstream by concentrating and synchronizing tributary peaks.[16]	1) Quantify basin-level hydrologic effect of channelization on each affected basin, including changes in flood return frequencies. 2) Identify mitigation.	See 2.B.E above
	E. Decreased Pollutant Removal. Channelization can decrease natural pollutant removal by reducing instream structural complexity and turbulent-flow aeration, increasing flow velocity, reducing overbank flow, and by causing change in vegetation.[17]	1) Map waters lost to channelization in each affected drainage and characterize type, areal extent, and pollutant removal value. 2) Quantify affect on pollutant loadings to each affected waterbody and downstream	See 2.B.C above

Cause	Effect	Needed Analyses	Preliminary Response
		receiving waters. 3) Identify mitigation.	
	F. Change in Wetland and Riparian Vegetation. Channelization and associated maintenance can directly destroy wetland and riparian vegetation and can change site features to prevent reestablishment of characteristic species.[18]	1) Map and Identify types and areas of affected vegetation. 2) Identify mitigation.	See 1C above
	G. Impaired Beneficial Uses.Channelization and associated maintenance can directly impair beneficial uses by reducing waterbody area; increasing stream velocity; disrupting riffle and pool sequences, cover, and other structural features; changing substrate; cutting off nutrient inputs to and from backwaters and riparian wetlands, dewatering upstream reaches, and reducing aesthetic and recreational value. Reduced overbank flooding can adversely affect reproduction of riparian vegetation and wetland and riparian functions.[19] Channelization can inhibit the movement of fish, other aquatic biota, and wildlife, and thus isolate and reduce the viability of populations up and downstream.[20] Construction of channels can introduce sediment, nutrients, and toxics into the water column.[21]	1) Identify direct and indirect effects of proposed channelization projects on beneficial uses. 2) Characterize and display at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 3) Identify effects of channelization on terrestrial and aquatic habitat connectivity. 4) Identify mitigation.	See 1D above

Cause	Effect	Needed Analyses	Preliminary Response
4. DECREASED FLOOD STORAGE	A. Increased Runoff. Reduced flood storage on the floodplain and in channels, swales, wetlands, backwaters, and other natural depressions increases and accelerates runoff.[22]	1) Quantify total and peak volumes of increase runoff for each affected drainage. 2) Identify mitigation.	See 2.B.E above
5. INCREASED GROUNDWATER PUMPING	A. Change in Groundwater Storage. Increased groundwater pumping can lower watertables locally or in distant donor basins.[23]	1) Quantify and map locations of project-induced changes in groundwater levels. 2) Identify mitigation.	See 2.B.B. above
6. DRY WEATHER DISCHARGE	A. Change in Baseflow. Dry weather runoff from urban activities can increase dry-period streamflows.[24]	1) Quantify hydrologic effects of dry weather flows on the baseflow of each affected drainage.	See 2.B.A. above
	B. Increased Pollutant Delivery. Dry weather runoff can carry the pollutants generated by the activity causing the flow, e.g., pesticides, nutrients, and petrochemicals from landscape maintenance and cleaning sidewalks and vehicles. Collection of polluted dry weather flows in catch basins may result in shock loadings when it is displaced by subsequent storm flows.[25]	1) Quantify and characterize pollutant loadings from activities generating dry weather runoff to each affected drainage. 2) Identify mitigation.	See 2.B.C above
7. PRODUCTION OF URBAN POLLUTANTS	A. Increased Pollutant Delivery. Increased production of urban pollutants can cause increased delivery of pollutants to surface and groundwater.[26]	1) Quantify and characterize pollutant loadings from to each affected drainage. 2) Identify mitigation.	See 2.B.C above

Cause	Effect	Needed Analyses	Preliminary Response
8. CHANGE IN SOIL EROSION	A. Channel Destabilization. Changes in upland soil erosion can destabilize stream channels by changing the amount of sediment carried into the stream. The stream may then erode or aggrade its channel to balance its available energy with the changes in its sediment load. 1. Increased sediment from construction causes channel aggradation, changing stream cross sections and redirecting flows.[27] 2. Decreased sediment from a paved watershed can cause channel incision and/or side-cutting. The effect may be compounded by increased runoff from the paved watershed. Aggradation may occur downstream where the flow slows and deposits the eroded sediment, which may deflect flows against the channel banks and cause further bank erosion.[28]	1) Conduct geomorphologic analysis of channel response to increases in construction-related sediment. 2) Conduct geomorphologic analysis of channel response to long-term reductions in sediment delivery to each affected drainage. 3) Identify mitigation. Note: Sediment as a pollutant is considered in No. 7, "Production of Urban Pollutants".	See 3C above
9. INCREASED RUNOFF	A. Change in Soil Erosion. Increased runoff can dramatically increase soil erosion by causing greater runoff velocities which more effectively displace and carry soil particles. Construction-related soil destabilization can compound the effect.[29]	1) Quantify increases in sheet and gully erosion resulting from increased runoff. 2) Identify mitigation.	Se 2.B.D. above
	B. Change in Groundwater Storage.Increased runoff can reduce groundwater recharge and lower water tables, since water draining from impervious surface is unable to percolate to groundwater at that location.[30]	1) Map locations of and quantify losses of recharge and water table response. 2) Identify mitigation.	See 1B above

Cause	Effect	Needed Analyses	Preliminary Response
	C. Channel Destabilization. Increased peak runoff can destabilize channels by increasing the flow velocity and erosive power of the stream. Head cutting, incision and/or widening of the channel, and associated sideslope failures can result. Reduced sediment input as a result of change in soil erosion rates can compound the effect.[31] In small streams, increased runoff may also dislodge logs and other channel features that help to define the channel.[32]	1) Quantify channel geomorphic response to increased runoff for each affected drainage. 2) Identify mitigation.	See 3C above.
	D. Increased Pollutant Delivery. Increased runoff increases pollutant delivery because it can more effectively carry particulate and soluble pollutants to receiving waters. Increased flow velocity reduces contact time with soil and vegetation that might otherwise remove pollutants.[33]	1) Quantify types and quantities of increased pollutant loadings to each affected drainage. 2) Identify mitigation.	See 2.B.C above
	E. Increased Flooding Frequency Increased runoff and greater transport efficiency result in higher peak flows from storms of a given return period.[34]	1) Quantify basin level hydrologic effect of increased runoff on each affected basin, including changes in flood return frequencies. 2) Identify mitigation.	See 2.B.E above
	F. Change in Water Temperature. Increased runoff from urban areas can raise the temperature of receiving waters because runoff from impervious surfaces is often warmer than runoff from pervious surfaces or subsurface flow.[35]	1) Model increase in water temperature along stream profile of each affected drainage. 2) Identify mitigation.	Temperature alteration is a potential effect of covered activities. However, the HCP/NCCP requires stream setbacks and the C.3 provisions which will result in greater infiltration of water prior to entry into receiving waterbodies which will attentuate temperature increases associated with development. Project-level impacts on temperature will be evaluated in project-level CEQA review and water quality permitting.

Cause	Effect	Needed Analyses	Preliminary Response
	G. Impaired Beneficial Uses. Increased runoff can impair habitat values by flushing fish and invertebrates out of streams,[36] increasing water level fluctuations and the velocity of flows entering wetlands,[37] and causing salinity changes in estuaries and other nearshore marine waters.[38]	1) Identify direct effects of increased flow on aquatic biota, hydrologic regimes of adjacent wetlands, and salinity of marine receiving waters for each affected drainage. 2) Identify mitigation.	See 1D above
10. CHANGE IN GROUNDWATER STORAGE	A. Change in Baseflow. Changes in watertable level can cause changes in the dry weather baseflow of streams fed by groundwater.[39]	1) Quantify for each affected drainage the changes in baseflow associated with lowered water tables and map locations. 2) Identify mitigation.	See 1B above
	B. Change in Wetland and Riparian Vegetation. A lowered watertable can dry up wetlands, stress or kill mature riparian vegetation, and reduce or eliminate seedling survival.[40]	1) Identify types and areas of wetlands and riparian areas that would be affected by expected lowering of shallow water tables and map locations. 2) Identify mitigation.	See 1C above
	C. Impaired Beneficial Uses. A lowered watertable can impair water supply and other beneficial uses which use groundwater. Seawater intrusion is possible in coastal areas.[41] Aquifer compaction and subsidence can also occur.[42] Wetland and riparian areas can be dewatered, harming associated vegetation and habitats.[43]	1) Identify affects of expected water table lowering on water supply and other beneficial uses and map locations. 2) Identify mitigation.	See 1D above

Cause	Effect	Needed Analyses	Preliminary Response
11. CHANNEL DESTABILIZATION	A. Channelization. Channel erosion can threaten property and structures, leading to placement of riprap or other engineered stabilization of critical sections.[45]	1) Identify stream reaches in which project-induced channel destabilization may require channelization. 2) Identify mitigation.	See 3C above
	B. Change in Groundwater Storage. Channel incision can dewater shallow aquifers adjacent to the channel.[46]	1) Identify and map stream reaches in which project-induced stream incision may dewater shallow aquifers. 2) Identify mitigation.	See 1B above
	C. Increased Pollutant Delivery. Channel erosion can result in increased suspended solids and turbidity in the water column.[47]	1) Identify and map stream reaches subject to project-induced destabilization, quantify changes in channel dimension, and volume of eroded material for each affected basin. 2) Identify mitigation.	See 2.B.C above
	D. Increased Flooding Frequency.Channel aggradation can cause local flooding by diverting flows and decreasing a stream's flow capacity.[48]	1) Identify and map stream reaches in which project-induced channel destabilization may cause aggradation and associated flooding. 2) Identify mitigation.	See 2.B.E above
	E. Change in Water Temperature. Bank erosion and aggradation can increase water temperature by creating a broader channel with shallow flows, increased water surface relative to flow volume, and a smaller proportion of shaded water surface. As a result, summer water temperatures and daily and seasonal temperature fluctuations tend to be greater.[49]	1) Identify and map stream reaches in which project-induced destabilization can increase water temperature. 2) Identify mitigation.	See 9F above

Cause	Effect	Needed Analyses	Preliminary Response
	F. Change in Wetland and Riparian Vegetation. Channel destabilization can encroach on riparian wetlands and undermine streamside vegetation.[50]	1) Identify, characterize, and map wetland and riparian areas subject to encroachment by channel destabilization; . 2) Identify mitigation.	See 1C above
	G. Impaired Beneficial Uses. Channel destabilization can reduce or eliminate habitat, recreation, esthetic values, and other uses by affecting deep pools, pool-riffle ratios, undercut banks, substrate suitability, and other structural features.[51]	1) Identify, characterize, and map stream reaches in which channel destabilization can directly impair beneficial uses. 2) Identify mitigation.	See 1D above
	H. Increased Maintenance and Property Damage. Channel erosion can undermine streamside buildings, bridges, utility crossings, and other property. Aggradation can bury diversion structures and other infrastructure and may require removal to maintain flow capacity.	1) Identify and map stream reaches in which destabilization may cause increased maintenance and property damage. 2) Identify mitigation.	See 3C above
12. CHANGE IN BASEFLOW	A. Change in Groundwater Storage. Reduced stream baseflow can decrease groundwater recharge by reducing wetted area and the amount of water available for recharge in stream channels.[52]	1) Identify and map affected stream reaches. 2) Quantify losses of recharge and water table response. 3) Identify mitigation.	See 1B above
	B. Change in Water Temperature. Decreased baseflow, typically resulting from change in groundwater storage, can cause elevated and fluctuating stream temperature because groundwater usually enters the stream at cool, stable temperatures.[53]	1) Identify and map affected stream reaches; 2) Quantify temperature effects along stream profile. 3) Identify mitigation.	See 9F above

Cause	Effect	Needed Analyses	Preliminary Response
	C. Change in Wetland and Riparian Vegetation Decreased stream baseflow can cause riparian vegetation to shift to upland species.[54]	1) Characterize and map affected riparian areas. 2) Identify mitigation.	See 1C above
	D. Impaired Beneficial Uses. 1. Decreases in the amount or duration of baseflow can impair habitat quality by eliminating aquatic and riparian habitat area, reducing flow velocities, and otherwise disrupting the life cycles of plants and animals which are dependent on water.[55] 2. Increases in baseflow resulting from dry weather discharge can impair waterbodies such as seasonal wetlands, vernal pools, and intermittent streams which are naturally defined by seasonal water availability.	1) Identify and map affected waterbody segments. 2) Characterize and quantify changes in baseflow. 3) Identify direct effects on beneficial uses 4) Identify mitigation.	See 1D above
13. INCREASED POLLUTANT DELIVERY	A. Impaired Beneficial Uses. Urban pollutants can impair many beneficial uses, e.g., water supply, recreation, fish and wildlife habitat, and shellfish production.[56]	1) Identify direct effects of increased pollutant loadings on beneficial uses in each affected waterbody segment. 2) Identify mitigation.	See 2.B.C above
14. INCREASED FLOODING FREQUENCY	A. Channelization. Increased flooding can lead to channelization of the critical section to more efficiently pass flood flows.[57]	1) Identify stream reaches in which project-induced flooding may require channelization. 2) Identify mitigation.	See 3C above
	B. Impaired Beneficial Uses. Increased flooding can impair habitat,[58] water supplies, navigation, and other beneficial uses.	1) Identify stream reaches in which project-induced flooding may impair beneficial uses. 2) Identify mitigation.	See 1D above

Cause	Effect	Needed Analyses	Preliminary Response
	C. Increased Maintenance and Property Damage.Increased flood frequency can result in more maintenance and flood damage.	1) Identify stream reaches in which project-induced flooding may increase maintenance and property damage. 2) Identify mitigation.	See 2.B.E above
15. INCREASED WATER TEMPERATURE	A. Impaired Beneficial Uses. Increased water temperature can directly stress aquatic biota and can also affect other parameters associated with habitat quality, such as dissolved oxygen concentration and rate of chemical reactions.[59]	1) Identify and map affected waterbody segments. 2) Quantify temperature changes. 3) Characterize effects on beneficial uses. 4) Identify mitigation.	See 1D above
16. DECREASED POLLUTANT REMOVAL	A. Increased Pollutant Delivery. Less removal of pollutants by natural processes can result in greater concentrations of pollutants in receiving waters.[60]	1) Quantify effects to pollutant loadings for each affected waterbody. 2) Identify mitigation.	See 2.B.C above
17. CHANGE IN WETLAND AND RIPARIAN VEGETATION	A. Channel Destabilization. Loss of vegetation and its associated anchoring root masses can destabilize channel banks and other geomorphic features.[61]	1) Characterize and map affected geomorphic features. 2) Identify mitigation.	See 3C above
	B. Change in Water Temperature. Loss of riparian vegetation can increase maximum water temperature by exposing more water surface to the sun. Daily and seasonal temperature fluctuations also tend to be greater.[62]	1) Identify and map stream reaches in which loss of riparian vegetation can increase water temperature. 2) Identify mitigation.	See 9F above
	C. Decreased Pollutant Removal. Removal of vegetation adjacent to a waterbody can reduce removal of pollutants from the waterbody and from the overland flow draining to the waterbody.[63]	1) Describe type, areal extent, and pollutant removal value of affected vegetation and map location. 2) Identify mitigation.	See 1C above

Cause	Effect	Needed Analyses	Preliminary Response
	D. Impaired Beneficial Uses. Loss of vegetation directly impairs the quality of aquatic and riparian habitat by reducing cover, structural diversity, and nutrient sources.[64] Removal of vegetation can also fragment and isolate remaining patches of habitat, resulting in decreased habitat value over large areas.[65]	1) Identify affected waterbody segments. 2) Characterize direct effects of vegetation loss on beneficial uses. 3) Characterize and display at project-area and regional scales existing wildlands, along with riparian corridors and other water features supporting habitat connectivity. 4) Identify effects of vegetation change on terrestrial and aquatic habitat connectivity. 5) Identify mitigation.	See 1C above

Table O-3. East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Summary of Key Conservation Measures as Mitigation for Water Quality Effects

Conservation Measure	Name	Water Quality Benefits
1.1	Acquire Lands for Preserve System	Acquisition of upper watershed lands containing streams, ponds, and wetlands.
1.2	Prepare and Implement Preserve Management Plans for Natural Habitat Lands	Management and enhancement of preserved streams, ponds, and wetlands
1.3	Prepare and Implement Agricultural Management Plans for Cultivated Agricultural Lands	Opportunities for riparian woodland/scrub restoration along creeks
1.6	Minimize Development Footprint Adjacent to Open Space	Minimize effects on existing and future open space resources
1.7	Establish Stream Setbacks	Maintain or improve water quality by filtering sediments and pollutants from urban runoff before they reach the stream.
1.10	Maintain and Improve Hydrologic Conditions and Minimize Erosion	C.3 provisions apply within permit area
1.12	Implement Best Management Practices for Rural Road Maintenance	Reduce sediment and other pollutants into downstream waterways and control herbicide/pesticide use
1.13	Implement Best Management Practices for Flood Control Facility Operations and Maintenance	Reduce sediment and other pollutants into downstream waterways
2.2	Wetland and Pond Enhancement and Management Program	Maintain and enhance hydrogeomorphic function Reduce sediment deposition and transport where appropriate
2.3	Wetland Restoration and Pond Creation Program	Provide a net increase of wetland and pond area, functions, and values in the inventory area.
2.9	Stream and Riparian Woodland/Scrub Enhancement Program	Promote the natural disturbance regime (e.g., flooding, sediment deposition and scour) Reduce water temperature and temperature variation Increase inputs of organic matter where appropriate Reduce sediment input and downstream sediment transport/deposition, where appropriate
2.10	Stream and Riparian Woodland/Scrub Restoration Program	Restore hydrological function, reduce temperatures, and reduce sediment.
2.12	Wetland, Pond, and Stream Avoidance and Minimization Measures	Stream setbacks, construction BMPs, control herbicide applications, erosion controls, facility placement.