

4.10 Surface Water Hydrology, Floodplain Encroachment, and Water Quality

This section presents the evaluation of potential impacts to surface water hydrology, floodplain encroachment, and water quality from implementation of the proposed alternatives.

4.10.1 Methodology for Impact Evaluation

Potential impacts to water resources were evaluated through a quantitative comparison of the potential impact of each of the proposed alternatives to relevant parameters affecting surface water hydrology, floodplains, and water quality (Table 4.10.A). These resource issue criteria were defined in discussions with involved resource agencies and public scoping meetings (LSA, 2001a, 2001b).

The objective of the proposed action is corridor preservation, and the criteria used in this analysis were developed to compare and contrast the different corridor alternatives for their potential impact to hydrology, floodplains, and water quality. Based on the results of the evaluation criteria developed in conjunction with the CETAP team (LSA, 2001a, 2001b), the evaluation criteria address the **potential risk to these resources** from the designation of a corridor position and the subsequent implementation of a transportation facility within that corridor. Potential risk is determined by the potential intersection of the facility corridor with the resource being evaluated. Thus, the analysis addresses the number of stream crossings, floodplain area crossed, etc., and addresses the resources in both direct impact and regional impact contexts. For example, the measurement of linear feet of USGS blue line streams quantifies the magnitude of that resource in the affected watersheds potentially impacted by the proposed action. Comparison of the magnitude of stream length potentially affected by each alternative is a quantitative approach to comparing the relative potential impact of the various corridor position alternatives. The use of the term "USGS blue line stream" in the EIS corresponds to the USGS definition and refers to USGS mapping of this feature in the project area.

Impacts were evaluated for various parameters for both the "existing" case, reflecting current available quantitative data, and for the "build out" case, reflecting values for those parameters projected for the "build out" of planned development in the project area. Values for the projected case were determined based on projected land use development patterns for the build out of the Riverside County General Plan and the incorporated cities in the project area (Planning Center, 2002). These projected land use designations formed the basis for the estimation of the extent of projected blue line stream channelization, riverine corridor continuity, area of the 100 year floodplain, and impaired stream segments.

Comparative data were collated and evaluated on a watershed basis (Table 4.10.B) using Geographical Information System (GIS) technology. Documentation of the data files used for the analyses and the complete quantitative comparative data resulting from the collation of GIS files for each alternative are presented in the Surface Water Hydrology, Floodplain Encroachment, and Water Quality Technical Report (LSA, 2002).

Table 4.10.A: Summary of Criteria Used for Parameter Evaluation of Alternatives -
Surface Water Hydrology, Floodplain Encroachment, and Water Quality

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Table 4.10.A: Summary of Criteria Used for Parameter Evaluation of Alternatives -
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Table 4.10.B - Hydrologic Units, Hydrologic Areas, and Hydrologic Subareas Crossed by CETAP Alternatives

Both “existing” and “projected” values are developed for various parameters within the project area, including the following:

- C **Land use designation.** Existing land use is based on existing zoning designation and examination of aerial photographs (Planning Center, 2002). Total areas designated “developed” or “undeveloped” for each Hydrologic Subarea (HSA) in the project area are presented in Table 4.10.C. Projected land use designations are developed based on Planning Center (2002).
- C **Location and extent of stream channel flood control improvements.** The location and extent of projected channel improvements are based on projected land use development patterns. In addition to the channel improvements identified for the existing case, channel improvements are assumed to be put in place in blue line streams adjacent to parcels wherein land use designation changes from an existing “undeveloped” use to a “developed” use.
- C **Riverine corridor continuity.** Maintenance of riverine corridor continuity is based on projected land use development patterns. Riverine corridor continuity reflects the percentage of projected “undeveloped” land use designations in the HSAs crossed by the alternative. Riverine corridor continuity decreases as development occurs in the affected HSAs.
- C **100 year floodplain area (existing case) and projected area with “developed” land use designation.** The location and extent of the 100 year floodplain are based on existing FEMA mapping. The projected “developed” area is based on projected land use development patterns. The projected “developed” area includes parcels wherein land use designation changes from an existing “undeveloped” use to a “developed” use (Planning Center, 2002). The projected area to be developed does not correspond directly with an increase in the area of the floodplain; however, an area converted to a “developed” use is assumed to undergo an increase in impervious area and demonstrate a higher runoff coefficient, contributing to increased runoff flows in the immediate drainage area.
- C **Location and length of stream segments with impaired water quality.** The location and extent of projected impaired stream segments are based on projected land use development patterns. In addition to the impaired segments identified for the existing case, impaired segments are assumed to occur in blue line streams adjacent to parcels wherein land use designation changes from an existing “undeveloped” use to a “developed” use.

The evaluation of the potential impacts of alternative implementation considered the entire defined bandwidth of each potential alternative, as described in LSA (2001b). While specifically addressing impacts within each alternative bandwidth, the evaluation also considers impacts on a watershed basis. The table of hydrologic units crossed (Table 4.10.B) presents the hydrologic units, areas, and subareas in the jurisdictions of the RWQCBs affected by the proposed alternatives (Figures 4.10.1 and 4.10.2).

4.10.2 Impacts

The potential impacts of each alternative are discussed by criteria grouping for parameters related to surface water hydrology, floodplain encroachment, and water quality (Table 4.10.A). Quantitative data are presented for each criterion evaluation;