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**Note –**

The Water Quality Protection chapter was updated May 6, 2014.

All other sections of this report were last updated July 31, 2013.

LUP Update Guide

Section 3. Water Quality Protection

The Coastal Act requires the protection and enhancement of marine and coastal water resources, including water quality. Nonpoint source (NPS) pollution, also called polluted runoff, is the nation's leading cause of water pollution both at the coast and inland. As stormwater runoff flows across the land, it picks up natural and human-made pollutants originating from many diffuse sources, and may transport these pollutants into lakes, rivers, wetlands, coastal waters, and groundwater.

Protection of coastal water resources requires not only minimizing pollutants in runoff, but also minimizing alterations in a site's natural hydrologic balance, measured in terms of the runoff flow regime (i.e., runoff volume, flow rate, timing, and duration). Because of the dispersed nature of NPS pollution and the cumulative impact of changes in runoff flows within a watershed, managing land uses both on a site-specific and a regional level is critical.

In California, the Coastal Commission and the State Water Resources Control Board (SWRCB) have developed a state NPS pollution control program that provides a coordinated statewide approach to managing NPS pollution, and conforms to federal Clean Water Act and Coastal Zone Management Act requirements for states to address NPS pollution. California state agencies are working collaboratively to implement the state's NPS Program Plan. These efforts include the Storm Water and Total Maximum Daily Load (TMDL) programs administered by the SWRCB and Regional Water Quality Control Boards statewide, as well as coastal-specific development planning and permitting programs of the Coastal Commission.

In the coastal zone, certified Local Coastal Programs (LCPs) are a key mechanism for achieving a high standard for coastal water resource protection. LCPs provide an important planning and regulatory framework for enhancing coastal NPS pollution control and minimizing changes in watershed hydrology that may adversely impact coastal resources. LCPs should be updated to include policies, standards, and ordinances that establish coastal water resource protection strategies and priorities for development, both during construction and over the life of a project.

Review the principal Coastal Act policies concerning Marine Resources and Water Quality in Sections 30230 through 30236. These policies can be found at:
<http://nrm.coastal.ca.gov/coactact.pdf>

What should an updated water quality component include?

It is important that the Land Use Plan of the LCP be updated to reflect advances in water quality planning and regulation, and that it includes, as applicable:

◆ Policies addressing watersheds

- Mapping of the jurisdiction's coastal zone watersheds, to support watershed assessment and planning.
- Identification of land uses in portions of the jurisdiction's watersheds that are within the coastal zone, and their relative impacts on coastal water resources.
- Identification of potential pollutant sources and changes in watershed hydrology in the coastal zone that may adversely impact coastal resources.
- Policies to protect coastal areas that help maintain the hydrologic balance (e.g., open space where rainfall can infiltrate or drain slowly to surface waters).
- Policies to support watershed management that provides protection of water resources; for example, (1) addressing priorities identified in recent watershed assessments, (2) designating conservation areas and buffers to protect riparian vegetation and wetlands, and (3) preventing long-term or cumulative adverse impacts on water quality from development not connected to a sanitary sewer system.
- Policies to support and complement the requirements of California's [Storm Water Permit programs](#), [TMDL implementation plans](#), Regional Water Quality Control Plans (i.e., [Basin Plans](#)), and other runoff water quality and hydrology management requirements of the SWRCB and Regional Water Quality Control Boards.

◆ Policies addressing development

- Policies that address water quality protection at all stages of development, including planning land uses, subdivisions, project-specific site design, alternatives analyses, construction, and post-development stages.
- Policies to ensure that Coastal Development Permits incorporate appropriate Best Management Practices (BMPs) in new development and redevelopment. BMPs are practices to minimize adverse impacts on waterbodies from changes in post-development runoff quality and the runoff flow regime (i.e., volume, flow rate, timing, and duration).

BMPs can include structural devices or systems, operational procedures, and activities such as training.

Example BMPs can be found in the [California Stormwater Quality Association's](#) Stormwater BMP Handbooks. Local governments should develop guidance to assist applicants in selecting appropriate BMPs.

- Policies for review of coastal development permit applications to ensure that potential adverse impacts from stormwater runoff to coastal water quality and hydrology are minimized, both during construction and post-development.
- Policies for review of coastal development permit applications to ensure that dry-weather runoff is minimized if it may potentially have adverse impacts to coastal waters. Dry-weather runoff is composed of discharges unrelated to precipitation, resulting from urban land uses such as landscape irrigation.
- Identification of the “design storm” sizing criteria that will dictate the design of BMPs, as follows:
 - Treatment Control BMPs: Typically the 85th percentile 24-hour storm event for volume-based BMPs, or the 85th percentile 1-hour storm event (with an appropriate safety factor of 2 or greater) for flow-based BMPs.
 - Runoff Control BMPs using flow retention techniques: Typically the 85th percentile 24-hour storm event.
 - Runoff Control BMPs using peak management techniques: Typically the 2-year through 10-year storm events.

◆ **Organization and specificity of water quality policies**

- Consider consolidating water quality policies into designated Water Quality chapters or sections to ensure that the policies guide updating of the implementing standards, and that such implementing standards are consistent with and adequate to carry out the Land Use Plan.
- Ensure that there are no requirements elsewhere in the LCP that create inadvertent conflicts with water quality and hydrology protection policies, standards, and BMPs. For example, a policy that requires curbing around parking lots may conflict with a policy that requires directing parking lot runoff into vegetated areas for infiltration.
- Ensure that the LUP provides policies with appropriate detail and specificity to effectively guide the update of the LCP Implementation Plan (IP) standards and implementing ordinances. When standards are discussed in this document, it refers to implementing standards in the IP.

Where can I read some examples of updated water quality protection policies?

Below is a model set of 19 water quality protection policies appropriate for updating a Land Use Plan's (LUP's) water quality component, to address development that requires a Coastal Development Permit and has the potential for adverse water quality or hydrology impacts to coastal waters. These are not required policies, but should be considered examples for updating an LCP, and should be adapted to reflect local conditions.

◆ Model set of water quality policies for development

All applications for a Coastal Development Permit for development that has the potential for adverse water quality or hydrology impacts to coastal waters shall be required to comply with the following policies:

Principles

1. Protect and Restore Water Quality

Protect and, where feasible, restore the quality of coastal waters to implement Coastal Act policies (in particular Sections 30230 and 30231). Coastal waters include the ocean, rivers, streams, wetlands, estuaries, lakes, and groundwater.

§ 30230. Marine resources shall be maintained, enhanced, and, where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

§ 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

2. Minimize Pollutants in Runoff from Development

Plan, site, and design development to minimize the transport of pollutants in runoff from the development into coastal waters.

3. Minimize Hydromodification

Plan, site, and design development to minimize post-development changes in runoff volume, flow rate, timing, and duration, to prevent adverse changes in the hydrology of coastal waters (i.e., hydro-modification).

Policies for Regulating All Development

4. Address Runoff Management Early in Site Design

Address runoff management early in site design planning and alternatives analysis, taking into account existing site characteristics that affect runoff (such as topography, drainage, vegetation, soil conditions, natural hydrologic features, and infiltration conditions) in designing strategies that minimize post-development changes in the runoff flow regime, control pollutant sources, and, where necessary, remove pollutants.

5. Use Source Control BMPs in All Development

Use Source Control Best Management Practices (BMPs), which can be structural features or operational actions, in all development to minimize the transport of pollutants in runoff from the development.

6. Give precedence to a Low Impact Development Approach to Stormwater Management

Give precedence to the use of a Low Impact Development (LID) approach to stormwater management in all development. LID emphasizes management of stormwater close to its source, using small-scale integrated site design and management practices to preserve or replicate the site's natural hydrologic balance through infiltration, evapotranspiration, filtration, detention, and retention of runoff.

7. Protect and Restore Natural Hydrologic Features

Plan, site, and design development to protect and, where feasible, restore natural hydrologic features such as groundwater recharge areas, natural stream corridors, floodplains, and wetlands.

8. Preserve or Enhance Vegetation

Plan, site, and design development to preserve or enhance non-invasive vegetation to achieve water quality benefits such as transpiration, interception of rainfall, pollutant uptake, shading of

waterways to maintain water temperature, and erosion control.

9. Maintain or Enhance On-Site Infiltration

Plan, site, and design development to maintain or enhance on-site infiltration of runoff, where appropriate and feasible.

10. Minimize Impervious Surfaces

Minimize the installation of impervious surfaces, especially directly-connected impervious areas, and, where feasible, increase the area of pervious surfaces in re-development, to reduce runoff.

11. Avoid Adverse Impacts of Stormwater Outfalls

Avoid construction of new stormwater outfalls and direct stormwater to existing facilities with appropriate treatment and filtration where feasible. Where new outfalls cannot be avoided, plan, site, and design stormwater outfalls to minimize adverse impacts on coastal resources, including consolidation of existing and new outfalls where appropriate.

12. Prevent Adverse Impacts to Environmentally Sensitive Habitat Areas from Runoff

In areas adjacent to an Environmentally Sensitive Habitat Area (ESHA), plan, site, and design development to protect the ESHA from any significant disruption of habitat values resulting from the discharge of stormwater or dry weather flows.

13. Manage BMPs for the Life of the Development

Implement appropriate protocols to manage BMPs (including ongoing operation, maintenance, inspection, and training) in all development, to protect coastal water quality for the life of the development.

14. Minimize Water Quality Impacts During Construction

Minimize water quality impacts during construction by minimizing the project footprint, phasing grading activities, implementing soil stabilization and pollution prevention measures, and preventing unnecessary soil compaction.

Policies for Regulating Developments of Water Quality Concern

Certain categories of development have a greater potential for adverse impacts to water quality and hydrology due to the extent of impervious surface area, type of land use, or proximity to coastal waters. These categories of Developments of Water Quality Concern shall be identified in the LCP. Additional BMPs may be required for a Development of Water Quality Concern, such as the use of an LID approach to retain on-

site the runoff from the appropriate design storm, Treatment Control BMPs to remove pollutants, and/or Runoff Control BMPs to minimize adverse changes in the runoff flow regime. The LCP shall specify the appropriate design storm for sizing Treatment Control and Runoff Control BMPs, and the amount of added impervious surface area that will trigger the requirement for Runoff Control BMPs.

All applications for a Coastal Development Permit for a Development of Water Quality Concern shall be required to comply with the following additional policies:

15. Conduct a Site Characterization and Document Expected BMP Effectiveness

Conduct a polluted runoff and hydrologic site characterization by a qualified licensed professional, early in the development planning and design stage, and document the expected effectiveness of the proposed BMPs.

16. Use LID, Site Design, and Source Control BMPs to Retain Runoff On-Site

Implement an LID approach to stormwater management that uses Site Design and Source Control BMPs to retain on-site (by means of infiltration, evapotranspiration, retention, or harvesting) the volume of runoff from the appropriate design storm, to the extent appropriate and feasible.

17. Conduct an Alternatives Analysis

Proposed development that does not include the use of LID, Site Design, and Source Control BMPs that will retain on-site the runoff from the appropriate design storm shall conduct an alternatives analysis to demonstrate that there are no appropriate and feasible alternative project designs that would substantially improve on-site runoff retention.

18. Use Treatment Control BMPs as Necessary

Use a Treatment Control BMP (or suite of BMPs), sized for the appropriate design storm, to remove pollutants of concern from runoff, if using appropriate and feasible LID, Site Design, and Source Control BMPs will not be sufficient to retain on-site the runoff from the appropriate design storm, or if additional pollutant removal is necessary to protect coastal waters.

19. Use Runoff Control BMPs if the Development Adds More than 15,000 Square Feet of Impervious Surface Area

Use a Runoff Control BMP (or suite of BMPs), sized for the

appropriate design storm, to minimize adverse post-development changes in the runoff flow regime, for a development that adds a net total of more than 15,000 square feet of impervious surface area, if using appropriate and feasible LID, Site Design, and Source Control BMPs will not be sufficient to retain on-site the runoff from the appropriate design storm.

◆ **Examples of Approved LCP Water Quality Components**

For examples of updated LCP Water Quality components that have been approved by the Coastal Commission, see:

- **City of Carmel-by-the-Sea IP Update (Water Quality) (2013)**
 - **Coastal Commission staff report:** LCP Amendment LCP-3-CML-13-0218-3-Part B (Water Quality Protection) – <http://documents.coastal.ca.gov/reports/2013/12/W22b-12-2013.pdf>

- **City of Arcata LUP & IP Update (2011)**
 - **LUP:** Amended General Plan, Ch. 4, Section C-RC-6 Water Resources Management (PDF pg. 44-48) – <http://documents.coastal.ca.gov/reports/2011/9/Th9b-9-2011-a4.pdf>.
 - **IP:** Amended Land Use Code, Ch. 9.54 Grading, Erosion, and Sediment Control (PDF pg. 45-51), and Ch. 9.66 Urban Runoff Pollution Control (PDF pg. 52-67) – <http://documents.coastal.ca.gov/reports/2011/9/Th9b-9-2011-a7.pdf>.
 - **Coastal Commission staff report:** ARC-MAJ-1-09 – <http://documents.coastal.ca.gov/reports/2011/9/Th9b-9-2011.pdf>

- **Del Norte County LUP & IP Update (2009)**
 - **LUP:** Section 1.C, Water Resources (PDF pg. 62-70) – <http://documents.coastal.ca.gov/reports/2009/10/W17b-10-2009-a1.pdf>
 - **IP:** Ch. 21.55.B., California Coastal Zone Entitlement Procedures, Water Quality (PDF pg. 144-154) – <http://documents.coastal.ca.gov/reports/2009/10/W17b-10-2009-a2.pdf>
 - **Coastal Commission staff report:** DNC-MAJ-2-03 – <http://documents.coastal.ca.gov/reports/2009/10/W17b-10-2009.pdf>

- **City Of Malibu LUP & IP Certification (2002)**
 - **LUP:** Water quality sections in Ch. 3.C.4 and Ch. 5.C.9 – <http://www.coastal.ca.gov/ventura/malibu-lup-final.pdf>
 - **IP:** Zoning Ordinance provisions in Ch. 17 and 18 – <http://www.coastal.ca.gov/ventura/malibu-lip-final.pdf>
 - **Coastal Commission staff report** – <http://www.coastal.ca.gov/ventura/malibu-lcp-findings-9mm2.pdf>

- **City of Laguna Beach LUP & IP Update (2012)**
 - **LUP:** General Plan, Conservation/Open Space Element, Topic 4 –

- <http://www.lagunabeachcity.net/civica/filebank/blobload.asp?BlobID=2688>
- **IP:** Municipal Code, Title 16 Water Quality Control –
http://www.qcode.us/codes/lagunabeach/view.php?topic=16-16_01&showAll=1&frames=on
- **Coastal Commission staff report:** LGB-MAJ-1-10 –
<http://documents.coastal.ca.gov/reports/2011/12/W9c-12-2011.pdf>

- **City of Seaside LUP Update & IP Certification (2012)**
 - **LUP:** Policy LUD-CZ 3.1.D Considerations for Natural Habitat Areas - Watershed/Water Quality (PDF pg. 57- 58) –
<http://documents.coastal.ca.gov/reports/2012/12/Th15a-12-2012-a2.pdf>
 - **IP:** Ch. 3, Section G, Water Quality (PDF pg. 175-181) –
<http://documents.coastal.ca.gov/reports/2012/12/Th15a-12-2012-a2.pdf>
 - **Coastal Commission staff report:** SEA-1-11 –
<http://documents.coastal.ca.gov/reports/2012/12/Th15a-12-2012.pdf>

- **Ventura County Public Works Plan Update (2008)**
 - **Channel Islands Harbor Public Works Plan:** PWP Third Amendment, December 11, 2008 –
<http://vcportal.ventura.org/HARBOR/docs/PWP%20%20Final%203rd%20Amendment%2008-25-10%20for%20website.pdf>
 - **Coastal Commission staff report:** 1-07 –
<http://documents.coastal.ca.gov/reports/2008/2/F5a-2-2008.pdf>

What are some current issues in stormwater management?

The following issues should be considered in updating LUP policies for protection of coastal water quality:

◆ Use of a Low Impact Development Approach

In traditional stormwater management, stormwater runoff is collected and conveyed through storm drains, pipes, or other conveyances to a centralized stormwater facility or directly into waterways. Many traditional BMPs, such as detention basins, mitigate peak runoff flows, but also extend the duration of flows, and this may have adverse impacts on downstream ecosystems. The end-of-pipe stormwater control and treatment technologies used in this approach address the consequences of development's impact on stormwater runoff, without addressing prevention of the problem.

Low Impact Development (LID) is an alternative approach to stormwater management that emphasizes management of stormwater on site to preserve or mimic the site's natural hydrologic balance. LID uses small-scale decentralized stormwater management practices that infiltrate, evapotranspire, filter, store, or detain runoff close to its source. The LID

approach focuses first on designing development to preserve the site's natural resources that affect runoff, and then uses integrated stormwater management practices that rely on the environmental services of soils and vegetation, or constructed systems that mimic these services.

LID has proven effective at minimizing adverse changes in runoff water quality and runoff flows resulting from development, and also benefits water supply through maintaining groundwater recharge. The LCP update should require the preferential use of an LID approach for stormwater management in new development and redevelopment.

For more information, see:

- ❑ **Low Impact Development (LID) Factsheet** – <http://www.coastal.ca.gov/nps/lid-factsheet.pdf>
- ❑ **A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption** – http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/docs/ca_lid_policy_review.pdf

◆ **Effect of Impervious Surfaces on the Hydrologic Balance**

When a site is developed, construction of impervious surfaces, compaction of soils, removal of vegetation, and alterations in topography can impact the site's hydrologic balance. Stormwater infiltration, interception by vegetation, and evapotranspiration are reduced, and a greater percentage of rainfall flows overland as runoff. With natural groundcover, about 25% of rain infiltrates deeply into the ground to reach the aquifer, and only about 10% becomes surface runoff; the remainder of the rain is accounted for by evapotranspiration and shallow infiltration. In highly urbanized areas, only about 5% of rain deeply infiltrates, and more than half of all rain becomes surface runoff.

The changes in a site's post-development stormwater runoff regime (i.e., runoff volume, flow rate, timing, and duration) associated with development may increase pollutant levels in stormwater runoff, as the runoff transports pollutants that have collected on impervious surfaces, and also may cause physical impacts to receiving waterways and other coastal resources. The increased surface runoff typically requires infrastructure to minimize flooding. Natural waterways may become vital to handle increased flows, and are frequently hardened with concrete or rip rap to move water more quickly and prevent erosion. In addition, as infiltration is lessened, there may be a reduction in groundwater recharge and stream base flows, impacting wetlands, riparian corridors, in-stream habitat, and domestic wells.

For more information, see:

- **Factsheet on How Urbanization Affects the Water Cycle** – <http://www.coastal.ca.gov/nps/watercyclefacts.pdf>

◆ **Control of Runoff from Landscape Irrigation**

Runoff from landscape irrigation is a significant source of water pollution. Recent legislation (AB 1881, effective January 1, 2010) requires local agencies to adopt the state’s Updated Model Water Efficient Landscape Ordinance (or to submit their own local ordinance for approval) to promote water conservation and protect water quality. The ordinance requires new or rehabilitated landscapes of a certain size (depending on the type of development) to implement provisions that include limiting water use, preventing overspray and runoff, taking advantage of opportunities for stormwater retention, and using “appropriate technology” (i.e., drip irrigation).

To guide the IP development, the LUP should include a policy to address this new requirement. For example: “Development shall be required to implement appropriate measures to ensure a water efficient landscape to comply with the Water Efficient Landscape Ordinance.”

For more information, see:

- **Updated Model Water Efficient Landscape Ordinance** – <http://www.water.ca.gov/wateruseefficiency/landscapeordinance/>
- **Information on the 2013-14 Drought** - <http://www.water.ca.gov/waterconditions/index.cfm>

Where can I find additional information on runoff water quality?

- **California Coastal Commission’s Water Quality Program** – <http://www.coastal.ca.gov/nps/npsndx.html>
- **California Stormwater Quality Association’s Stormwater BMP Handbooks** – <http://www.cabmphandbooks.com>
- **California Nonpoint Source Encyclopedia** – http://www.swrcb.ca.gov/water_issues/programs/nps/encyclopedia.shtml
- **California Stormwater Quality Association’s California’s Low Impact Development Portal** – <https://www.casqa.org/resources/california-lid-portal>

- **West Coast Low Impact Development Partnership** –
<http://westcoastlid.org/>
- **Low Impact Development Center** –
<http://www.lowimpactdevelopment.org/>
- **State Water Resources Control Board's LID webpage** –
http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/