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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 coastal waters, including the ocean, rivers, streams, wetlands, estuaries, lakes, 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, including 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.

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

In California, the Coastal Commission and the State Water Resources Control Board (State Water Board), in coordination with the nine Regional Water Quality Control Boards (Regional Water Boards), have developed a state NPS 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. Many 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 State and Regional Water 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.

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 watershed management

- 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 hydrologic management requirements of the State and Regional Water 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 Best Management Practices (BMPs) in new development and redevelopment. BMPs are practices to minimize adverse impacts on coastal waters from changes in 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 two times the 85th percentile 1-hour storm event 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 curbs 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 the implementing standards in the IP.

Where can I read some examples of updated water quality 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 hydrologic 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. See the Coastal Commission's Model LCP Water Quality Guidance document and additional resources for implementing these policies on the Water Quality Guidance for Local Governments webpage.

♦ 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 hydrologic impacts to coastal waters should 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 the Transport of Pollutants from the Development**
   Plan, site, and design development to minimize the transport of pollutants from the development into runoff and coastal waters.

3. **Minimize Changes in the Site's Runoff Flow Regime**
   Plan, site, and design development to minimize post-development changes in the site's runoff flow regime (i.e., volume, flow rate, timing, and duration), to preserve the pre-development hydrologic balance and prevent adverse changes in the hydrology of coastal waters (i.e., hydromodification).

Policies for Regulating All Development

4. **Address Runoff Management Early in Site Design Planning**
   Address runoff management early in site design planning and alternatives analysis, integrating existing site characteristics that affect runoff (such as topography, drainage patterns, vegetation, soil conditions, natural hydrologic features, and infiltration conditions) in the design of strategies that minimize post-development changes in the runoff flow regime, control pollutant sources, and, where necessary, remove pollutants.

5. **Give Precedence to a Low Impact Development Approach To Stormwater Management**
   Give precedence to a Low Impact Development (LID) approach to stormwater management. LID emphasizes preventive Site Design strategies integrated with small-scale, distributed Best Management Practices (BMPs) to replicate the site's pre-development hydrologic balance through infiltration, evapotranspiration, harvesting for later on-site use, detention, or retention of stormwater close to the source.

6. **Protect and Restore Hydrologic Features**
   Plan, site, and design development to protect and, where feasible, restore hydrologic features such as stream corridors, drainage swales, topographical depressions, groundwater recharge areas, floodplains, and wetlands.

7. **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.

8. **Maintain or Enhance On-Site Infiltration**
   Plan, site, and design development to maintain or enhance on-site infiltration of runoff, where appropriate and feasible, to reduce runoff

and recharge groundwater.

9. **Minimize Impervious Surfaces**

   Plan, site, and design development to minimize the installation of impervious surfaces, especially impervious areas directly connected to the storm drain system, and, where feasible, increase the area of pervious surfaces in redevelopment, to reduce runoff.

10. **Use Source Control BMPs**

    Use Source Control BMPs, which can be structural features (such as a roof over an outdoor storage area) or operational actions (such as proper application of pesticides and fertilizers) to control pollutant sources and keep pollutants segregated from runoff, in order to minimize the transport of pollutants in runoff from the development.

11. **Prevent Adverse Impacts to Environmentally Sensitive Habitat Areas**

    In areas in or 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 runoff flows.

12. **Minimize Adverse Impacts from Stormwater Outfall Discharges**

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

13. **Manage BMPs for the Life of the Development**

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

14. **Minimize Water Quality Impacts During Construction.**

    Minimize water quality impacts during construction by minimizing erosion and non-stormwater runoff, minimizing the discharge of sediment and other pollutants resulting from construction activities, and minimizing land disturbance and 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, and/or proximity to coastal waters. These

categories of *Developments of Water Quality Concern* should be identified in the LCP.

Additional BMPs may be required for a *Development of Water Quality Concern*, such as the use of LID BMPs to retain the design storm runoff on-site; Treatment Control BMPs to remove pollutants; and Runoff Control BMPs to minimize adverse changes in the site's runoff flow regime. The LCP should specify an appropriate design storm standard for sizing LID, Treatment Control, and Runoff Control BMPs (at a minimum, the 85th percentile design storm). The LCP should also specify 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* should 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. **Size LID, Runoff Control, and Treatment Control BMPs for the 85th Percentile Design Storm**

    Size LID, Runoff Control, and Treatment Control BMPs to infiltrate, retain, or treat, at a minimum, the runoff produced by the 85th percentile 24-hour storm event for volume-based BMPs, or two times the 85th percentile 1-hour storm event for flow-based BMPs.

17. **Use an LID Approach to Retain the Design Storm Runoff On-Site**

    Use an LID approach that gives priority to preventive Site Design strategies to minimize post-development changes in the site's stormwater flow regime, supplemented by structural BMPs to retain on-site (by means of infiltration, evapotranspiration, or harvesting for later on-site use), at a minimum, the runoff produced by the 85th percentile 24-hour design storm, to the extent appropriate and feasible.

18. **Conduct an Alternatives Analysis if the Design Storm Runoff is Not Retained On-Site Using LID**

    Conduct an alternatives analysis to demonstrate that there are no appropriate and feasible alternative project designs that would substantially improve runoff retention, if a proposed development will

not retain on-site the runoff produced by the 85th percentile 24-hour design storm using an LID approach.

19. **Use Treatment Control BMPs if Necessary**

    Use a Treatment Control BMP (or suite of BMPs) to remove pollutants of concern from any portion of the runoff produced by the 85th percentile 24-hour design storm that will not be retained on-site, or if additional pollutant removal is necessary to protect coastal waters.

20. **Use a Runoff Control BMP if Adding More Than 15,000 ft^2 Net Impervious Surface Area**

    If a proposed development will add a net total of more than 15,000 ft^2 of impervious surface area, and any portion of the runoff produced by the 85th percentile 24-hour design storm will not be retained on-site, use a structural Runoff Control BMP to minimize adverse post-development changes in the runoff flow regime.

♦ Examples of Approved LCP Water Quality Components

For examples of updated Water Quality components of LCPs, Long Range Development Plans (LRDPs), and Public Works Plans (PWPs) that have been recently approved by the Coastal Commission, see the Coastal Commission's Water Quality Guidance for Local Governments webpage.

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 replicate 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 on Low Impact Development, see:

- **Coastal Commission's Low Impact Development webpage –** http://www.coastal.ca.gov/water-quality/low-impact-dev/
- **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
- **California 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/

♦ Effect of Impervious Surfaces on the Hydrologic Balance

When a site is developed, construction of impervious surfaces, compaction of soils, removal of vegetation, and alteration of 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 flow regime (i.e., 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, which may impact wetlands, riparian corridors, in-stream habitat, and domestic wells.

For more information on the effect of impervious surfaces, 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. Legislation (AB 1881, effective January 1, 2010) requires local agencies to promote water conservation and protect water quality by adopting the state's Model Water Efficient Landscape Ordinance (updated in 2015), or submitting their own local ordinance for approval. 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 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 on water efficient landscaping, see:

- **2015 Updated Model Water Efficient Landscape Ordinance –** http://www.water.ca.gov/wateruseefficiency/landscapeordinance/

- **Drought Information, Calif. Dept. of Water Resources webpage –** http://www.water.ca.gov/waterconditions/index.cfm

Where can I find more information on runoff water quality?

- **California Coastal Commission's Water Quality Program webpage –** http://www.coastal.ca.gov/water-quality/

- **California Stormwater Quality Association's Stormwater BMP Handbooks –** https://www.casqa.org/resources/bmp-handbooks

- **California Nonpoint Source Encyclopedia –** http://www.waterboards.ca.gov/water_issues/programs/nps/encyclopedia/