Building a Vision: Putting the Pieces Together

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Building Liveable, Sustainable Communities:
Water Quality and Supply is Linked to Growth

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Our Mission and Framework

- “Our mission is to preserve and enhance the quality of California’s water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.”
- *Q: Why are we so focused on discharges?*
- *A: The legal framework (Clean Water Act) drives us to be discharge-oriented.*

But is that the best way to address our water quality and supply future?

- Is it “Sustainable”?
- Is there a better way?
- Can we address the problems before they are problems?

Population Growth and Land Use may be the LARGEST Threat to Water Quality

- Growth projections:
  - 39 million by 2010
  - 43 million by 2020
  - Almost 50 million by 2025, we will then be as densely populated as China is now.
- Housing Starts - over 200,000 per year for last 3 years

California's Urban Expansion Driven by Population Growth

- In California, per capita land use is actually declining.
- Expansion continues – driven by population growth.
- Population growth is not something we can change – so we better be preparing to handle it properly! THINK SUSTAINABILITY

Sustainability and Water Resources

- Sustainability has many definitions and applications (some very specialized)
- In our communities there are three main test / elements (each of which is undergoing a paradigm shift today).

Sustainability Tests

- Resource – protection to enhancement and reuse (“runoff is a resource”)
- Technical – complex, technological standard-based to simple, natural, performance-based solutions
- Institutional – centralized, subsidized approaches to decentralized, self-supporting approaches

What can the State do to help implement / enforce the CWA?

- Appropriate designation, development and enforcement of appropriate Beneficial Uses would encourage smarter growth.
- We also need to develop effective criteria for protecting uses from pollutants and/or habitat disturbance associated with urbanization impacts.
- Apply all our tools to encourage avoidance and minimization of impacts through better sighting and management practices.

Low Impact Development (LID) Principles

- Modelled after nature:
  - manage rainfall at the source using uniformly distributed **decentralized** micro-scale controls.

LID Principles (cont.)

LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

LID Principles (cont.)

- IMPORTANT: LID is a principled approach that uses many different techniques (some greener than traditional techniques) that **collectively** mimic predevelopment runoff patterns and/or protect aquatic resources.

- The application of “green techniques” alone does **not ensure** achievement of LID – i.e., green roofs and rain catchments alone do not ensure the predevelopment runoff is matched.

How does LID relate to Smart Growth and Conservation Design?

- Key distinction is that LID is an ecosystem-based approach – it seeks to design the built environment to remain a functioning part of the ecosystem
- LID is not a growth management or land use control strategy
- Does not take a stand on larger, growth issues, but can be integrated with Smart Growth and Conservation design to achieve multiple benefits.

The Basic Tools of LID

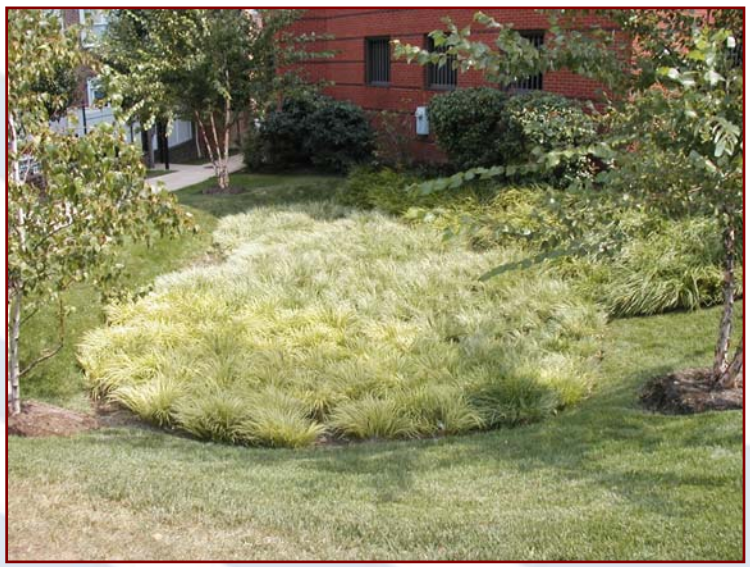
1. Encourage conservation measures
2. Promote impact minimization techniques such as impervious surface reduction
3. Provide for strategic runoff timing by slowing flow using the landscape
4. Use an array of integrated management practices to reduce and cleanse runoff
5. Advocate pollution prevention measures to reduce the introduction of pollutants to the environment

LID Examples

- LID is a principled application of techniques, including:
  - Site design/planning
  - Permeable pavement
  - Green roofs
  - Bioretention
  - Tree box planters
  - Disconnected downspouts
  - Rain gardens
  - A general reduction of connected, impervious surfaces in runoff pathways

LID Benefits

- **Multifunctionality** – landscaping costs also serve as stormwater treatment costs, etc.
- **Lower lifetime costs** – e.g., lower overall operation, repair, maintenance, and decommissioning costs



- **Reduced offsite costs** – fewer offsite sewer collection and treatment costs
- **Functional use of open space land** – LID practices can be put in open space, thereby not reducing developable land

- **Additional environmental and social benefits** – multiple objectives met

LID is Cost Effective

TRADITIONAL DEVELOPMENT	LOW IMPACT
$ Pay to Pipe / Pump offsite $ Risk onsite WQ violations / fines	Treat onsite
$ Pay to treat at end of Pipe	Reduced piping / pumping costs
$ Excavate, grade site and haul away materials	Utilize natural terrain / preserve natural channels

Reports of Reduced Costs

- Case studies show reduction of 25-30% over conventional projects.
- Somerset Rain Gardens[1]
  - Original retention ponds - $400,000
  - Implementation using natural drainage - $100,000
- Pembroke subdivision[2]
  - Used LID practices to eliminate stormwater ponds
  - Saved $200,000

Sources: 1- “Low-impact Development” by Mary Catherine Hager
2- “Stormwater Strategies: Community Responses to Runoff Pollution” NRDC

LID is Cost Effective for Development and Redevelopment

Incorporate LID into project design from the beginning

Multi-benefit projects reduce traditional piping, pumping and offsite treatment costs.

Incorporate LID into Urban Redevelopment

When retrofitting existing sewer system or re-landscaping sidewalk area, incorporate tree-box filters into storm drains.

NPDES Stormwater Permits – help or hindrance?

- Municipal Separate Storm Sewer Systems (MS4s), in both large and small communities, are required to comply with MS4 requirements
- Much of the permit requirements focus on traditional BMPs and general, indirect municipal efforts (like general planning, outreach/education etc.)
- In 2002, Standard Urban Storm Water Mitigation Plans (SUSMPs – but they are called “performance standards” in some parts of the State) became mandatory for all MS4 permits

SUSMPs and Sustainability

- SUSMPs and other “performance standards” in MS4 permits require new developments and, in some cases, “significant” redevelopments to apply rigorous measures to mitigate the effects of urbanization.
- In the San Francisco Bay Area, some MS4s are required to develop Hydrograph Modification Management Plans (HMPs).
- The technical approaches and science behind some of the issues are still being debated in the State.
- Q: Does Low Impact Development = SUSMPs and HMP compliance?

Yes, LID = SUSMPs

- In theory, a well designed and executed LID project would fully comply with MS4 permit requirements (and probably avoid 404/401 permits, too).
- Translators are needed to help communities demonstrate compliance with MS4 requirements

LID and SUSMPs (cont.)

- Clearly SUSMP=LID works best for new development and significant redevelopment
- But strategic LID projects could also be used to retrofit urban landscapes to address other watershed problems
- State Board staff are working on developing translator tools for municipal officials who must comply with SUSMPs and wish to use LID-like approaches

Sustainable Projects Present Real Community Opportunities

- If done right, more sustainable projects will deliver:
  - NPDES compliance
  - Clean Water Act promises
  - Low Lifetime Costs to operate, maintain, decommission, etc.
  - Community buy-in and support through meeting multiple objectives, etc.
  - Unpredictable community economic opportunities (e.g., tourism and other ancillary benefits to the community)

Critical Mass for Sustainability and Low Impact Development

- Many upcoming activities and events
- State Board staff involved in a new partnership (the California Water and Land Use Partnership) along with LGC staff to develop more tools for local officials
- Consolidated Grants Program to fund Urban Stormwater Projects (Low Impact Development criteria)
- State Board staff working with Water Education Foundation to develop translator for SUSMPs to LID/sustainability
- MS4 and other Permits are being reissued with LID language and drivers
- Lots of training and workshops planned

Evidence of Shift

- Performance measures that would SHOW we are moving in the right direction.
- More NPDES permits for municipal separate storm sewer systems (MS4s) that contain LID-type requirements for New Development (we see more of this now).
- Increased judicial support for current need / approach to protecting water resources from stormwater discharges (we see this now).

Shift (cont.)

- Planning departments and land use agencies are excited about natural systems (we see this now)
- Natural Systems (low tech, natural function-based technologies) are embraced as cornerstones of “sustainable development”
- A number of disciplines integrated into stormwater management.

The End (or just the beginning?)