

WASHINGTON STATE
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E C O L O G Y

Low Impact Development through NPDES Permits

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TAKE AWAY MESSAGES



- Municipal SW permits will require LID on new and redevelopment projects
- Site LID: necessary but insufficient to protect aquatic resources
- Follow endorsed design methods & local codes
- Use approved computer models & methods
- More training options available — take advantage

Municipal Stormwater NPDES Permits

- 7 Phase I primary permittees (cities & counties)
- 86 Phase II primary permittees in West. Wash
- All must develop SW Programs that meet permit requirements

Permit Requirements

I
II
III
IV
V
 VI
VII
VIII
IX
X

- Legal Authority
- Public Education & Outreach
- Public Involvement & Participation
- System Mapping
- Illicit Discharge Elimination
- Construction Site Runoff Control
- New Dev. & Redev. Runoff Control
- Pollution Prevention & O & M
- Coordination
- Structural Controls (only Phase I)

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LID addressed on 3 levels

- Site & subdivision - S5.C.4.a.i & ii. (S5.C.5.a in Phase I)
- Development Codes - S5.C.4.f.
- Watershed Scale - S5C.4.g.

Updated W Wa Permits

- Regulations to control runoff from new and re-development during construction and post-construction (S5.C.4.a.i)
- Site planning process and BMP selection, design and infeasibility criteria. (S5.C.4.a.ii)
- Long-term O/M standards
- Inspections/enforcement

Adopt Appendix I (or equivalent)

- Minimum Requirements
- Thresholds
- Definitions
- Exemptions, Adjustments, Variances
- Optional: Basin-specific plans (if equal in protection)

Adopt 2012 SWMMWW or other*:

*Other must document how meet MEP/AKART for water quality

Appendix 1 LID-related Changes

Section 2: Definitions

LID/ LID BMP's/ LID Principles
 Bioretention VS Rain Gardens
 Hard Surfaces
 Converted Vegetation Areas

Section 3: Thresholds

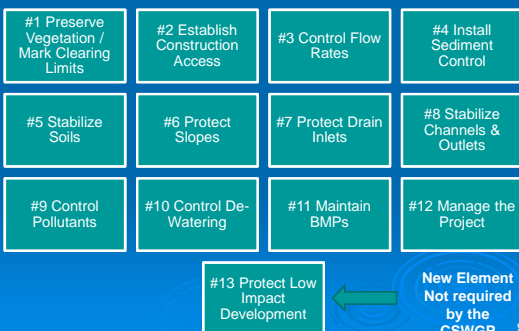
Remain same
 "Hard" surface replaces "impervious"

Appendix 1 LID-related Changes

➤ Section 4: Minimum Requirements

- M.R. #1: Site Planning for LID
- M.R. #2: Construction ESC
 - New Element for LID Protection
- M.R. #5: On-site Stormwater Management
 - LID Requirements for projects subject to M.R. #1 - #5
 - LID Requirements for projects subject to M.R. #1 - #9

Minimum Requirement #2



Element #13 Protect Low Impact Development

New Element #13



- Install/maintain erosion & sediment control BMPs to protect bioretention, rain gardens, and permeable pavement BMPs
- Fully restore BMPs if they accumulate sediment during construction
- Keep construction equipment and foot traffic off bioretention, rain garden, & permeable pavement BMPs

Element #13 Protect Low Impact Development

New Element #13



- Keep muddy equipment off pavement or base material
- Keep runoff off permeable pavements
- Keep heavy equipment off final grades (don't compact it)

Appendix 1 LID-related Changes

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New Development Thresholds

Min. Requirements #1 - #9:

- $\geq 5,000$ sq. ft. new and replaced hard surface area, or
- $\geq 3/4$ acre vegetation to lawn/landscape, or
- ≥ 2.5 acres native vegetation to pasture

Min. Requirements #1 - #5:

- $\geq 2,000$ sq. ft. new and replaced hard surface area, or
- $\geq 7,000$ sq. ft. land disturbance

Min. Requirement #2 -Erosion control

- All projects (No submittal for projects $< 2,000/7,000$)

Redevelopment Thresholds

New hard surface or converted pervious

- Same thresholds as "New Development"

Replaced hard surfaces

- MR #1 - #5 – Same as "New Development"

Replaced hard surfaces:
MR #6 - #9 (Treatment and Flow Control) only if:

- New + replaced hard surfaces $\geq 5,000$ sq. ft., AND proposed improvements value $> 50\%$ of existing improvements value
- For roads, new hard surfaces $\geq 5,000$ sq. ft., and $\geq 50\%$ of existing hard surface area

Minimum Requirement #5

if $2,000 \text{ sq ft} \geq \text{hard surfaces} < 5,000 \text{ sq ft}$,
and $7,000 \text{ sq ft} \geq \text{converted vegetation} \leq 3/4 \text{ acres}$

➤ Use LID BMPs from List #1, where feasible
Or

➤ Meet LID Performance Standard

- Cannot use Rain Gardens; can use Bioretention and any other BMPs
- Demonstrate compliance using approved models & methods



List #1

- **Lawn and landscaped areas:**
 - Soil Quality & Depth; BMP T5.13
- **Roofs:** Consider in order listed; use first feasible
 1. Full Dispersion or Downspout Full Infiltration
 2. Rain Gardens or Bioretention; $\geq 5\%$
 3. Downspout Dispersion
 4. Perforated Stub-out Connection
- **Other Hard Surfaces** (driveways, patios, walks, parking lot):
Consider in order listed; use first feasible
 1. Full Dispersion
 2. Permeable pavement or Rain Garden/Bioretention $\geq 5\%$
 3. Sheet Flow Dispersion or Concentrated Flow Dispersion

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Minimum Requirement #5

if $\geq 5,000$ sq. ft. hard surface,
or $\geq \frac{1}{4}$ acre lawn/landscape,
or 2.5 acres pasture

Project Type & Location	Requirement
Development (new or redevelopment) on any parcel inside the UGA, or development outside the UGA on a parcel less than 5 acres	LID Performance Standard and BMP T5.13 OR List #2 (applicant option)
Development (new or redevelopment) outside the UGA on a parcel of 5 acres or larger	LID Performance Standard and BMP T5.13

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List #2


hard surfaces $\geq 5,000$ sq. ft.

- **Lawn and Landscaped Areas**
 - Soil Quality & Depth; BMP T5.13
- **Roofs**
 1. Full Dispersion or Downspout Full Infiltration
 2. Bioretention $\geq 5\%$
 3. Downspout Dispersion
 4. Perforated Stub-out Connection
- **Other Hard Surfaces** (driveways, patios, walks, lots)
 1. Full Dispersion
 2. Permeable pavement
 3. Bioretention $\geq 5\%$
 4. Sheet flow Dispersion/Concentrated Flow Dispersion

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Infeasibility Criteria

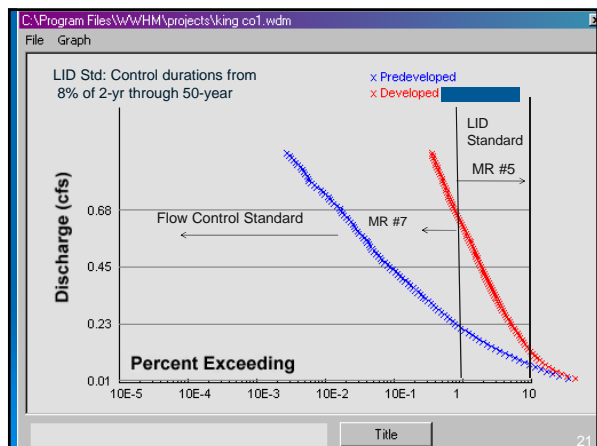
- **Site/Engineering-based Conditions**
 - Listed within SW Manual for each LID BMP
- **Competing Needs**
 - Listed in Chapter 5, Vol V of SW Manual
- **Municipalities can use and cite; or adopt changes and be prepared to defend as AKART and MEP.**




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LID Performance Standard

Match post-development discharge durations to pre-developed (pre-European settlement) durations from 8% of the 2-year flow to 50% of the 2-year flow.





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*Other must document how meet MEP/AKART for water quality

Runoff Models

Adopt 2012 SWMMWW equivalent*

- Regulations to control runoff from new and re-development during construction and post-construction (S5.C.4.a.i)
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Manual References for Phase I - S5.C.5.a.ii and Phase II - S5.C.4.a.ii (see handout)

(a) Site planning requirements (Vol. I, Ch. 3)	(b) BMP selection criteria (Vol. II - V)	(c) BMP design criteria (Vol. II - V)
(d) BMP infeasibility criteria (Vol. III & V)	(e) LID competing needs criteria (Vol. V)	(f) BMP limitations (Vol. II - V)

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Guidance Documents

- Stormwater Manual for West. Wash.
 - Volume 1: Chapters 2 (requirements) and 3 (site planning)
 - Volume III: Section 3.4: Bioretention, & Permeable Pavement Site Procedures and Design Guidance
 - Volume V: Chapter 5: On-site BMPs expanded
Chapter 7: Expanded for Bioretention
- West. Wash. Hydrology Model
 - Updated LID Modeling Procedures
- 2013 Rain Garden Handbook for West. Wash.
- LID Manual for Puget Sound – **Use not required**
 - Site Planning Guidance
 - BMP design criteria and guidance

SWMMWW: Vol V

Chapter 5

- BMP T5.10A Downspout Full Infiltration
- BMP T5.10B Downspout Dispersion
- BMP T5.10C Perforated Stub-out Connection
- BMP T5.11 Concentrated Flow Dispersion
- BMP T5.12 Sheet Flow Dispersion
- BMP T5.13 Post-Construction Soil Quality and Depth
- BMP T5.14 Rain Gardens
- BMP T7.30 Bioretention Cells, Swales, and Planter Boxes
- BMP T5.15 Permeable Pavement
- BMP T5.16 Tree Retention and Tree Planting
- BMP T5.17 Vegetated Roofs
- BMP T5.30 Full Dispersion



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Other Related Permit Conditions

Plan review, Initial inspections, enforcement - S5.C.4.b

Long-term maintenance inspections – S5.C.4.c

Staff training – S5.C.4.e.

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Initial Inspection & Maintenance of Permanent Stormwater BMPs/Facilities

Inspection to verify proper installation of all permanent stormwater facilities – includes LID BMPs/facilities . S5.C.4.b.iv

Verification of maintenance plan & responsible party for “stormwater treatment and flow control BMPs/facilities.” (includes vegetated roofs, permeable pavement, and bioretention where used for MR #6, and/or MR #7) S5.C.4.c

Inspect “stormwater treatment and flow control BMPs/facilities” & catch basins in residential developments every 6 months until 90% of lots constructed (or until construction has stopped and the site is stabilized). S5.C.4.c.iv

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Long-term Inspection & Maintenance of “Stormwater Treatment and Flow Control BMPs/Facilities”

Phase I - annual inspections & maintenance compliance S5.C.9.b.ii.

Phase II – annual inspections and maintenance compliance applies to those built under 2007, 2012, and 2013 NPDES permit provisions S5.C.4.c.iii

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Update Site Development Codes Rules & Standards

- Incorporate LID Principles & BMP's to the MEP
- Revised Codes, etc., become standard operating procedure
- Need to justify not using them, rather than asking for allowance to use them



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LID – Local Development Codes

Make LID the preferred and commonly used approach for site development

- Minimize impervious surface
- Minimize native vegetation loss



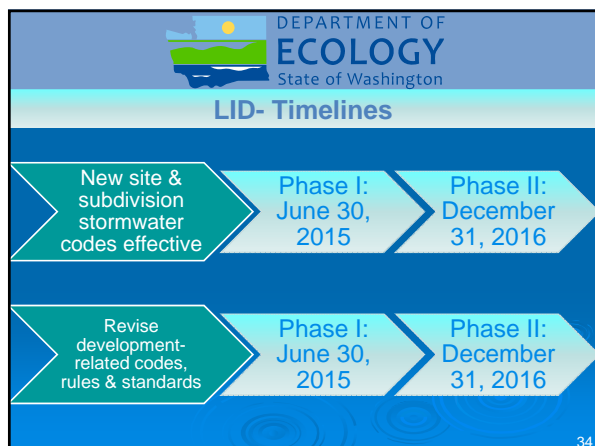
Integrating LID into Local Codes:
A GUIDEBOOK FOR
LOCAL GOVERNMENTS

PSP Integrating LID into Local Codes Guidebook

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Update Site Development Codes Rules & Standards

- Engineering & Street Standards
- Clearing & Grading Ordinance & Standards
- Parking Requirements
- Individual Zoning District Bulk & Dimension Regulations
- Subdivision Standards
- Landscaping and Tree Standards



Updated West Wa Permits LID Overview

Site & Subdivision Project Requirements

Updates of Local Development Codes, Rules, & Standards

Watershed-scale Stormwater Planning

Phase I – S5.C.5.c

Phase II – S5.C.4.g

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- Watershed Scale - S5C.4.g. (S5.C.5.c in phase I)

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LID – Watershed Scale Planning

Phase I County selects a watershed and leads a planning process

- Select watershed by Oct. 31, 2013
- Begin process by April 1, 2014
- Submit final plan by Oct. 1, 2016

Phase II:
Participate in watershed-scale planning led by a Phase I County

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Proposed watersheds

- Streams impacted by development & retain anadromous fish
- Targeted to accept significant growth
- Basins proposed in Phase I permit

Planning Process

- Baseline assessment
- Model flow & pollutants; use best available science
- Beneficial use impact identification
- Plan to address impacts

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Selected Watersheds

- King County: Bear Creek
 - Woodinville, Redmond, Snohomish Co.
- Snohomish County: Little Bear Creek
 - Woodinville, Bothell
- Pierce County: Spanaway Creek
- Clark County: Whipple Creek

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2014 Proposed Revisions to Municipal Permits and the West. Wash. Manual

- Permits
 - Watershed Planning
- Stormwater Manual
 - WWHM 2012 guidance
 - Infeasibility criteria changes
 - Bioretention/Rain Garden Soil Spec update
 - Underdrained Bioretention not LID for MR #5

Bioretention Status

- No changes in the application & limitations
- No changes to soil mix specifications
- Ongoing testing of new mixes to improve performance & reduce chances for pollutant export
- Initial toxicity monitoring shows significant reduced toxicity; RSMP scope includes additional testing


Training

- WWHM Training to demo new features especially LID modeling examples
- WA State LID Training Program
 - \$1 Million/year for 5 years
 - Free to phase II permittees and private development community
 - Sequenced geographically and timely
 - <http://www.wastormwatercenter.org/>

TAKE AWAY MESSAGES



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- Site LID: necessary but insufficient to protect aquatic resources
- Follow endorsed design methods & local codes
- Use approved computer models & methods
- More training options available – take advantage



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Questions?

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