

Current State of Stormwater Management and Related Regulations in Albuquerque

- **Traditional stormwater management practices in Albuquerque**
- Green infrastructure concepts and principles
- Existing local and state regulations
 - Existing local code requirements
 - State MS4 post-construction stormwater management requirements
 - Water rights
- Questions and discussion

Traditional Stormwater Management Practices



San Antonio Arroyo Sediment Basin with Retrofit Debris Containment



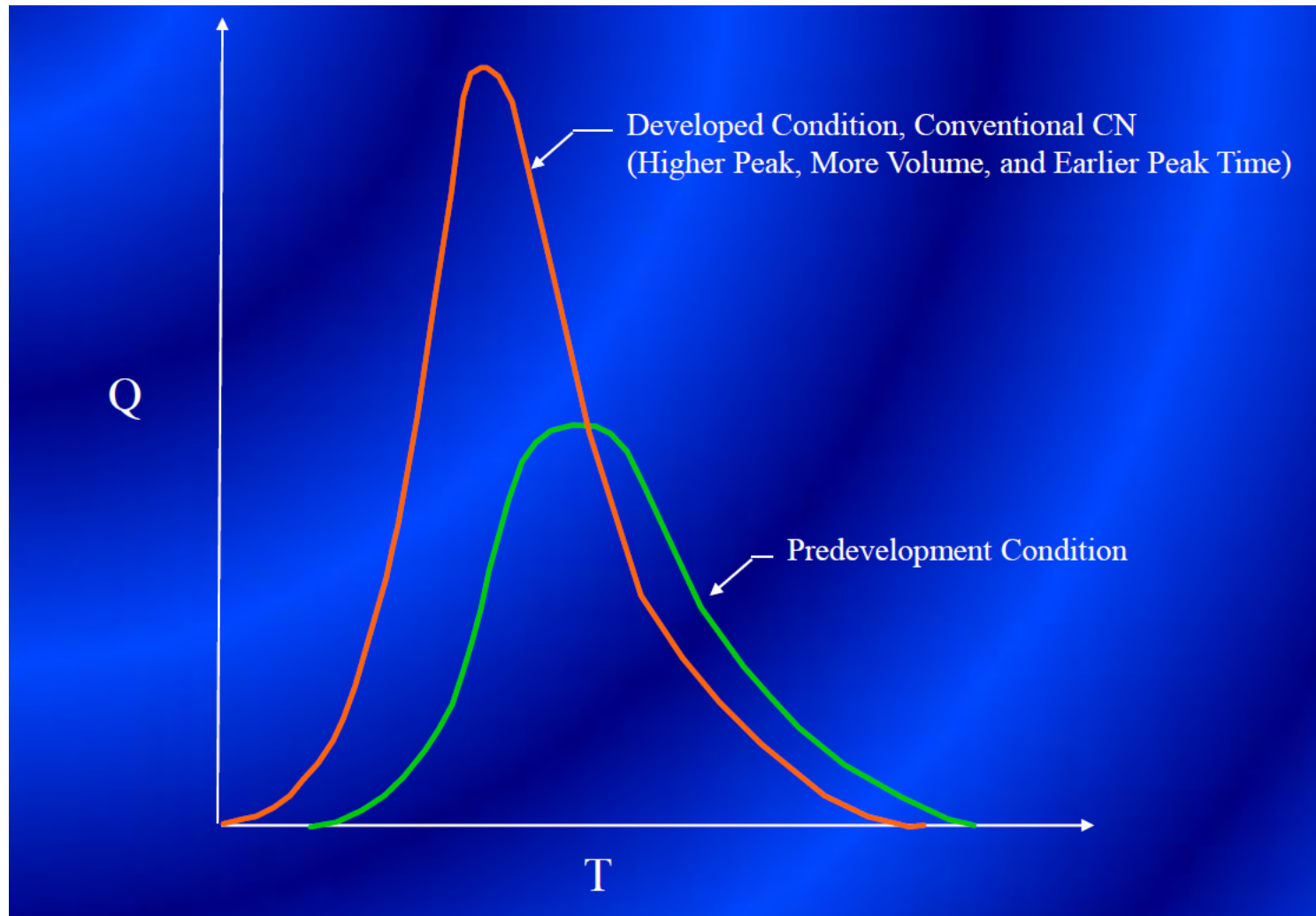
Traditional Stormwater Management Practices



Traditional Stormwater Management Practices



Increased Run-off Changes Stream Flow Characteristics



Current State of Stormwater Management and Related Regulations in Albuquerque

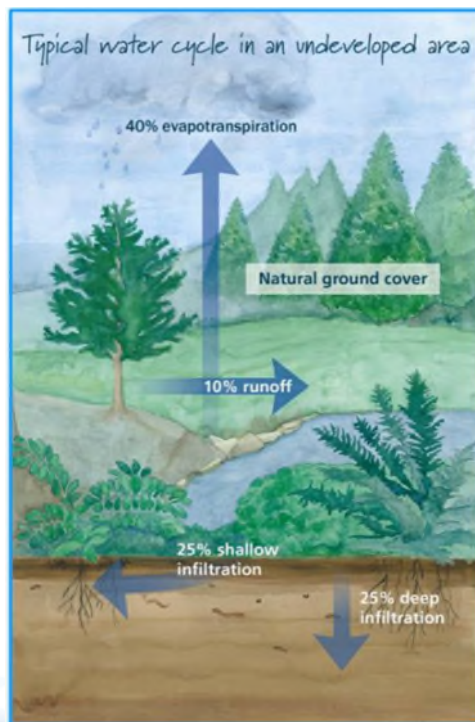
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Development Impacts: Runoff Volume

Typical pre-development conditions:

Runoff = 10%

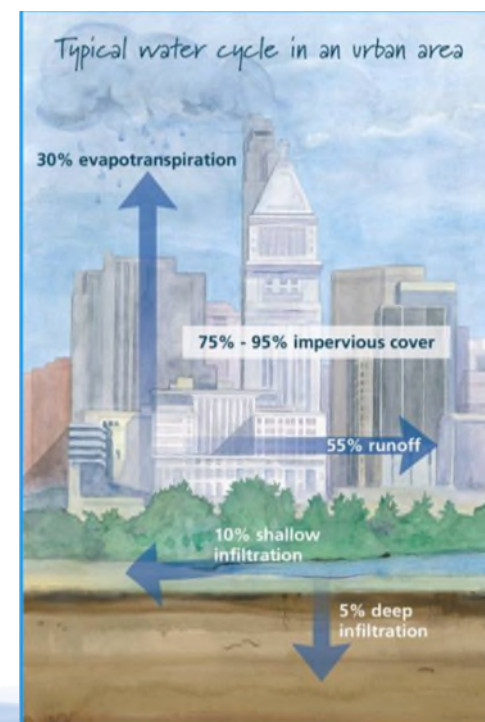
Infiltration = 50%



Typical post-development conditions:

Runoff = 55%

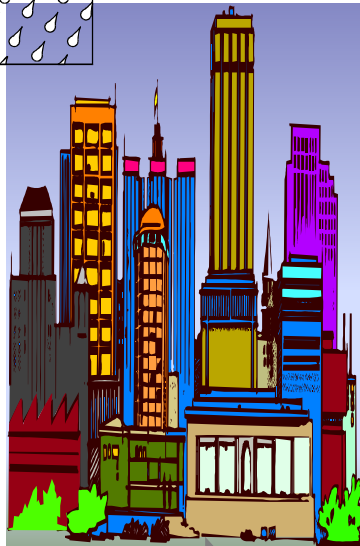
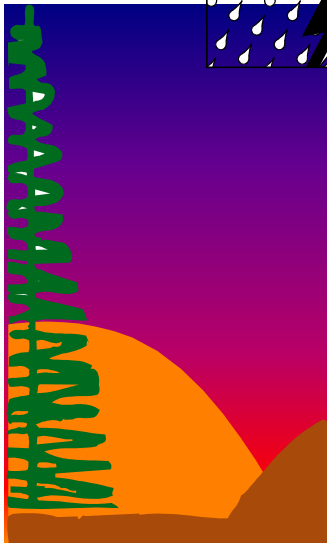
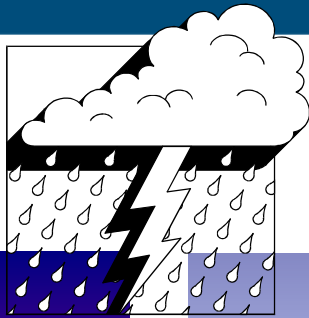
Infiltration = 15%



Increased Run-off Changes Stream Flow Characteristics



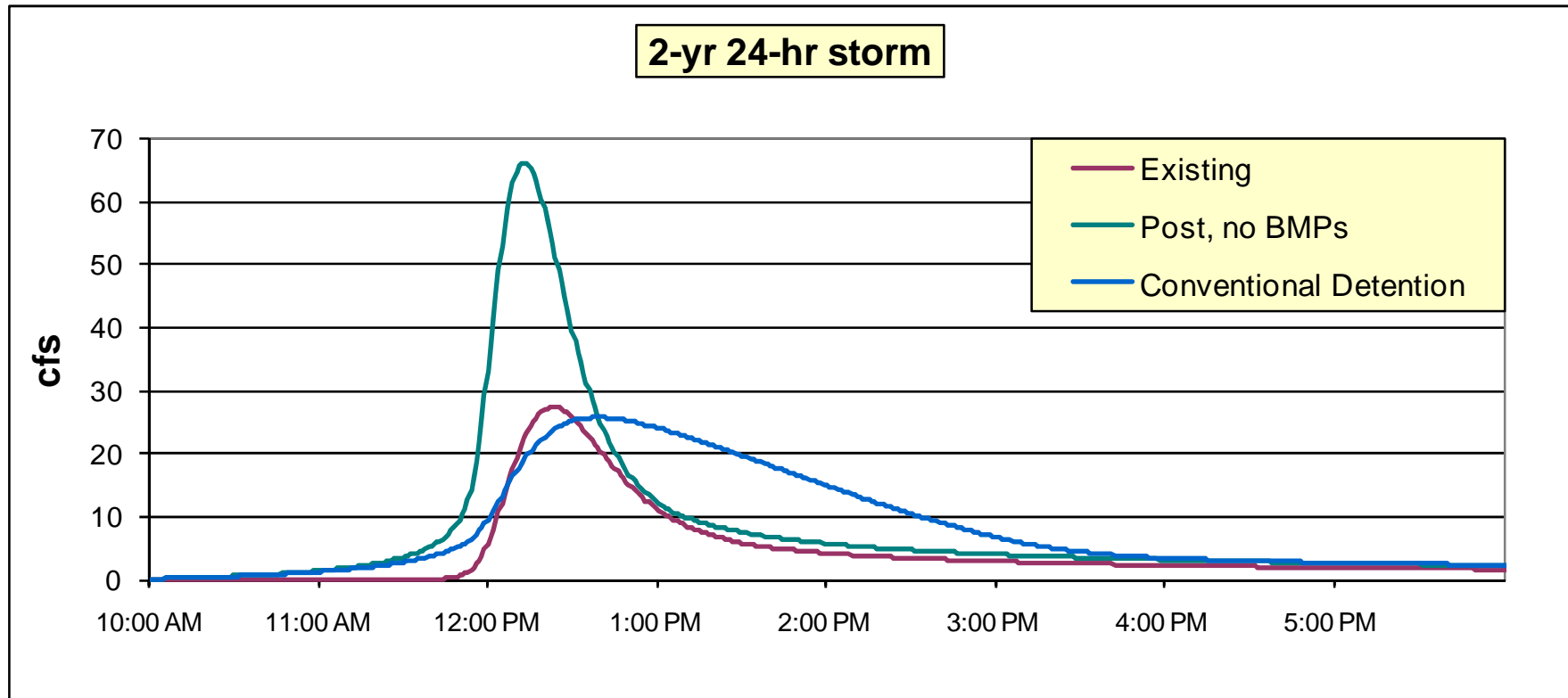
Pollutants in Stormwater Discharges



Nutrients
Pathogens
Sediment
Toxic Contaminants
Oil and Grease
Thermal Stress



Changes in Flow



Green Infrastructure Concepts

How do we make this...



function more like this?



Green Infrastructure Concepts

Can we make this...

function more like this?



“Green” Stormwater Guiding Principles

1. Manage stormwater runoff both at the source and at the surface.
2. Use plants and soil to slow, filter, cleanse, and infiltrate runoff.
3. Design facilities that are simple, low-cost, and aesthetically enhance the community.



What is Green Infrastructure?

- Site Design and Green Infrastructure Principles
 - Reducing impervious surfaces
 - Disconnecting impervious areas
 - Conserving natural resources
 - Using cluster/consolidated development
 - Using xeriscaping and water conservation practices



Green Infrastructure Site Design

Conventional “Fat” Street



Green Infrastructure “Skinny” Street



Source: NCSU-BAE

Green Infrastructure Site Design

Reduce Impervious Surfaces



Green Infrastructure - Open Space Preservation



Green Infrastructure Site Design

Impervious Area Disconnection



Green Infrastructure Implementation / Practices

- Bioretention
 - Bioswales
 - Infiltration Trench
 - Planter Boxes
- Permeable Pavement
- Water Harvesting
 - Cisterns
 - Rain Barrels
- Green Roofs/Living Roof
- Vegetated Swales

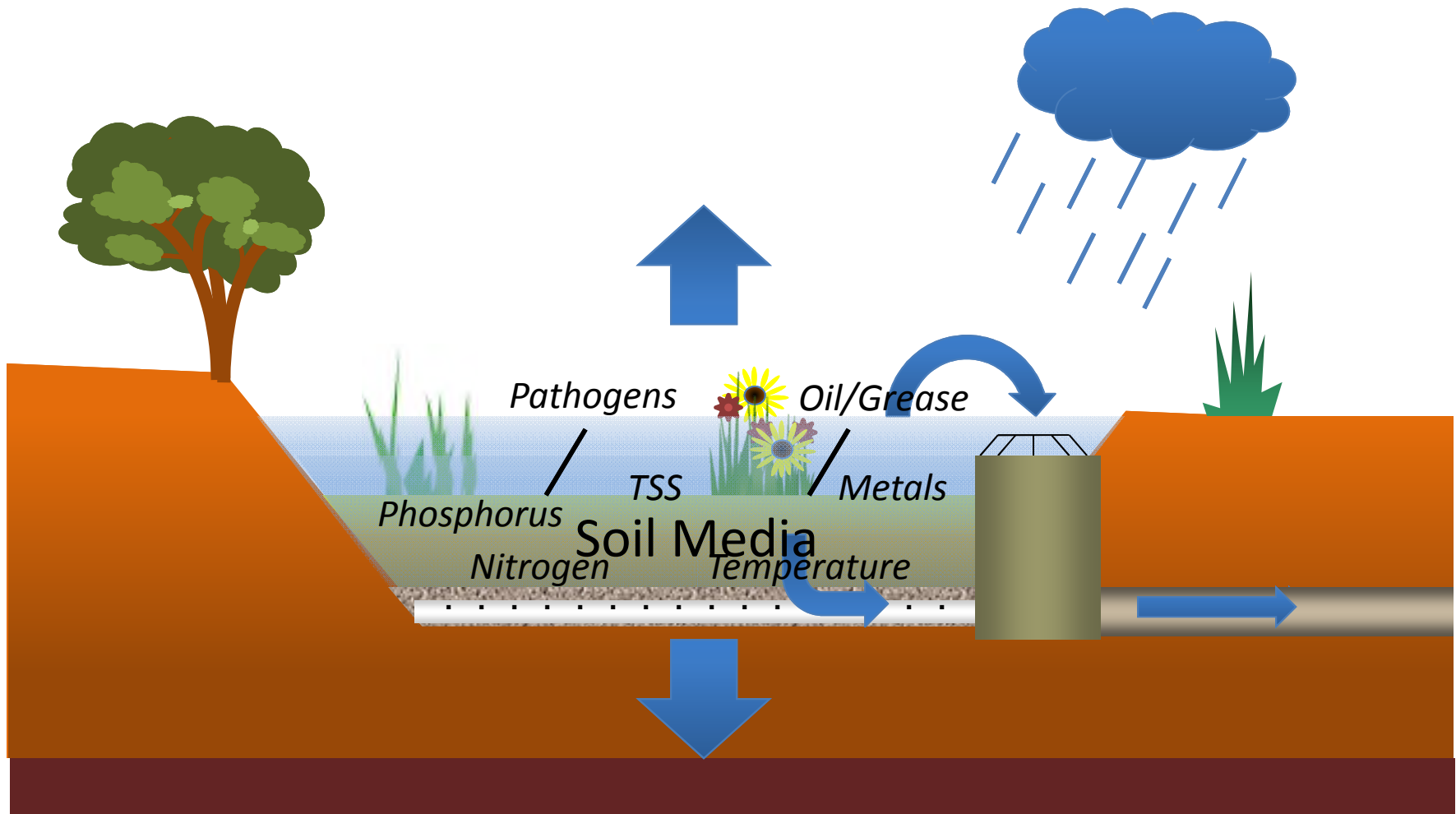


Green Infrastructure Implementation / Practices

Structural BMPs	Hydrologic controls				Removal processes				
	Storage/detention or flow attenuation	Infiltration	Evapotranspiration		Settling	Filtration	Sorption	Bioaccumulation	Biotransformation/phytoremediation
Bioretention	+	(+)	o	o	+	o	+	+	(o)
Bioswale	(+)	(+)	o	o	o	o	o	o	(o)
Permeable pavement	+	(+)	-	-	+	-	-	-	-
Infiltration trench	+	+	(o)	o	+	o	-	-	-
Planter boxes	+	(+)	o	o	+	o	(+)	(+)	(o)
Sand filter	o	(o)	-	-	+	(o)	-	-	(o)
Vegetated filter strip	-	+	+	o	o	o	-	-	-
Vegetated swale	(o)	(o)	o	+	+	-	-	-	-
Cisterns/rain barrels	+	-	-	-	-	-	-	-	-

Note: () optional function; + major function; o secondary function; - insignificant function

Green Infrastructure Practices - Bioretention



Source: NCSU BAE

Green Infrastructure Practices - Bioretention



Landscaped Areas/Open Space

Green Infrastructure Practices - Bioretention



Parking Lots



Green Infrastructure Implementation / Practices - Bioretention



Rights-of-Way

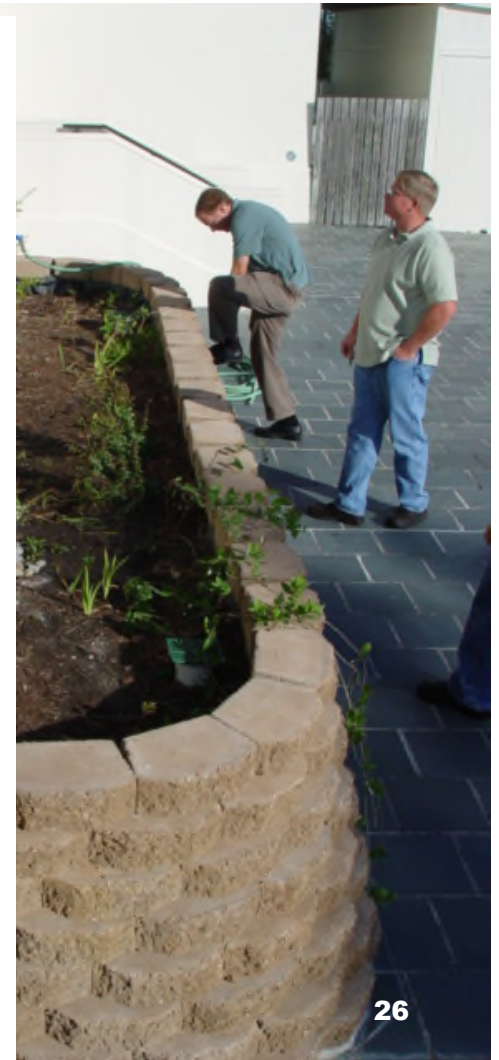
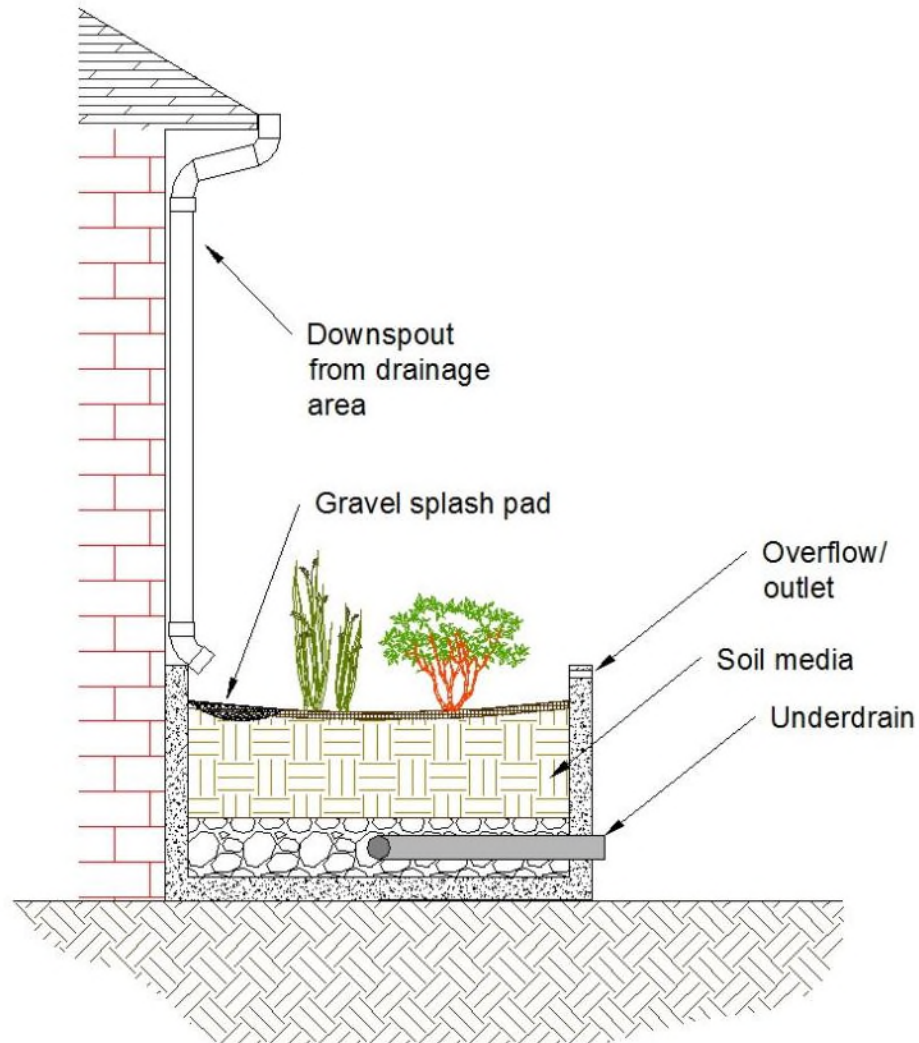
Green Infrastructure Practices – Bio/ Bioretention Swales

- Bioswales / Bioretention Swales



Green Infrastructure Practices – Planter Box

■ Flow Through Planter Boxes



Green Infrastructure Practices – Permeable Pavement

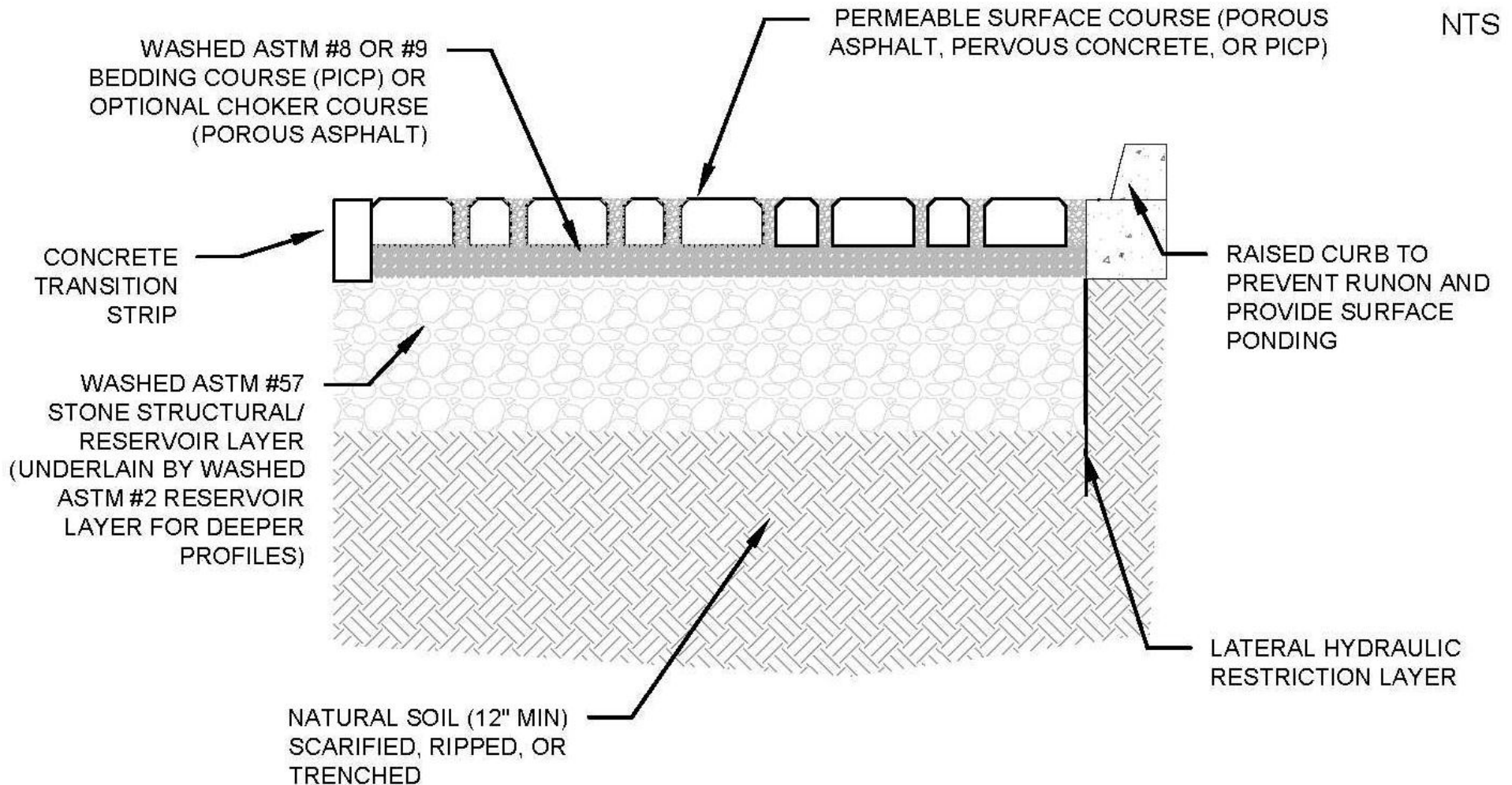


Photo Credit: Green Paving Solutions



Photo Credit: US EPA

Green Infrastructure Practices – Permeable Pavement



Green Infrastructure Practices – Permeable Pavement



Parking Lots

Green Infrastructure Practices – Permeable Pavement



Parking Lots

Green Infrastructure Practices – Permeable Pavement



Rights-of-Way

Green Infrastructure Practices – Permeable Pavement



Driveways and Alleys

Green Infrastructure Practices – Permeable Pavement



Driveways and Alleys

Green Infrastructure Practices – Living Roof



Intensive living roof



Extensive living roof

Green Infrastructure Practices – Living Roof



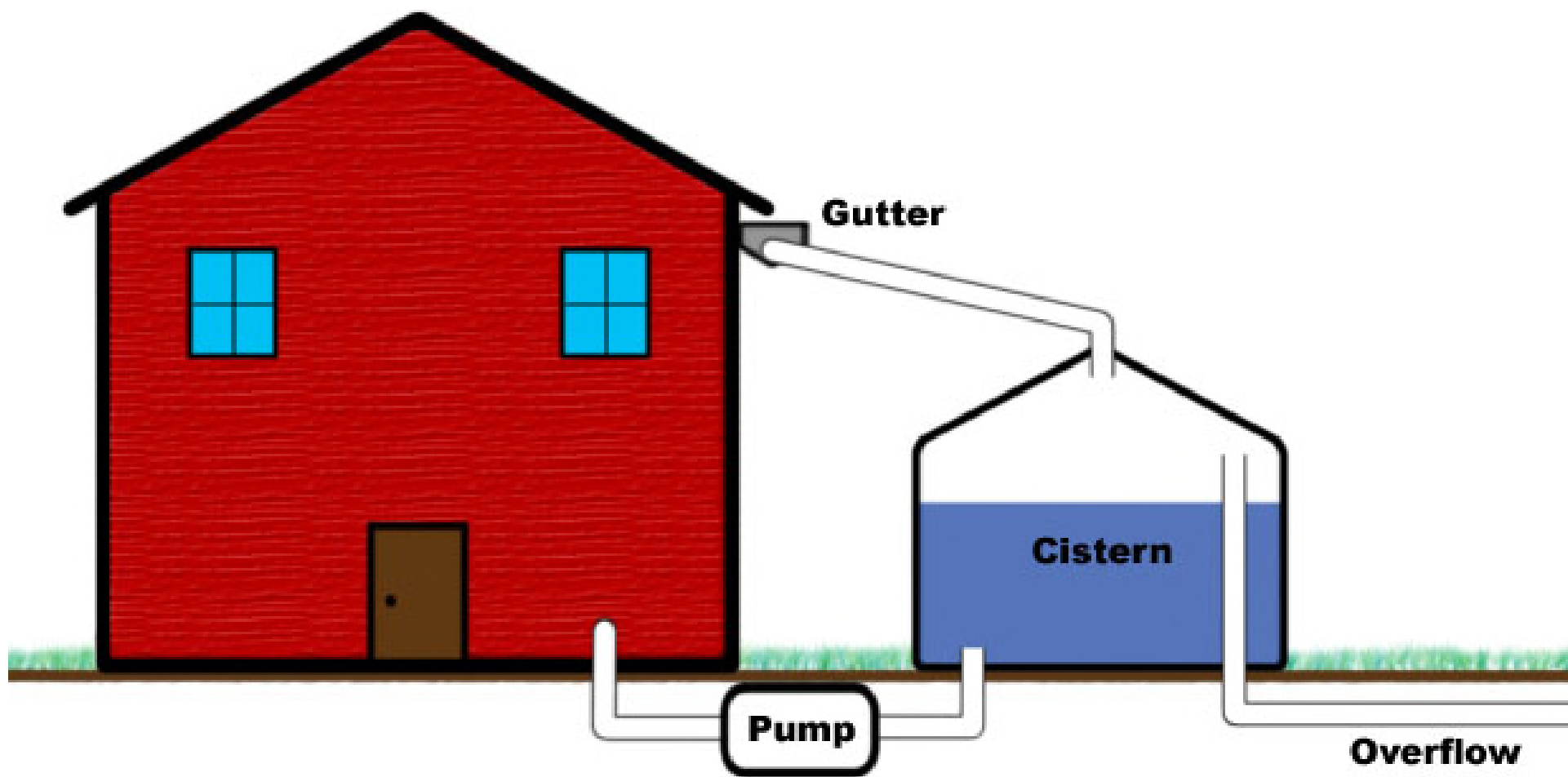
Green Infrastructure Practices – Living Roof



Green Infrastructure Practices – Living Roof



Green Infrastructure Practices - Water Harvesting



Green Infrastructure Practices – Water Harvesting



Green Infrastructure Practices – Water Harvesting



Green Infrastructure Practices – Water Harvesting



Green Infrastructure Practices - Water Harvesting



Green Infrastructure Practices – Treatment Train



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City of Albuquerque Local Code Requirements for Stormwater Management

- All new development projects, where practicable, shall manage the runoff from precipitation which occurs during 90th Percentile Storm Events (0.44 inches)

EPA Storm Water Permit Requirement for Post-Construction

NPDES Permit No. NMS000101
Page 1 of Part I

Region 6
1445 Ross Avenue
Zia g Dallas, Texas 75202-2733 NPDES Permit No. NMS000101

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"), the co-permittees as listed below,

City of Albuquerque
Department of Municipal Development
P.O. Box 1293
Albuquerque, NM 87103

Albuquerque Metropolitan Arroyo
Flood Control Authority (AMARCA)
2600 Prospect NE
Albuquerque, NM 87107

New Mexico Department of Transportation
District HI
P.O. Box 91750
Albuquerque, NM 87199-1750

University of New Mexico
Department of Safety, Health
and Environmental Affairs 1801
Tucker Street N.E.
Albuquerque, NM 87131

are authorized to discharge from all portions of the Albuquerque Municipal Separate Storm Sewer System (MS4) owned or operated by any permittee listed above, to waters of the United States, in accordance with the Storm Water Management Program(s), effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, IV, V, VI, VII, and VIII herein.

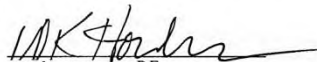
This is a renewal NPDES permit issued for these portions of the municipal separate storm sewer system.

This permit shall become effective on March 1, 2012.

This permit and the authorization to discharge shall expire the earlier of (1) ninety (90) days following the effective date of a watershed-based permit for the regulated Middle Rio Grande MS4s in the Albuquerque area or (2) at midnight February 28, 2017.

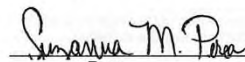
Issued on January 31, 2012

Prepared by



William K. on ker. P.E.

Acting Director
Water Quality Protection Division



Susanna M. Perca

Environmental Scientist
NPDES Permits and TMDLs Branch

5.b.ii(b) *Incorporate a stormwater quality design standard that manages the 90th percentile storm event discharge volume associated with new development sites and 85th percentile storm event discharge volume associated with redevelopment sites, through stormwater controls that infiltrate, evapotranspire the discharge volume, except in instances where full compliance cannot be achieved...*

Options to implement the site design standard include, but not limited to: management of discharge volume by canopy interception, soil amendments, rainfall harvesting, raintanks and cisterns, engineered infiltrations, bioretention, rooftop disconnections, permeable pavement...and other appropriate techniques, and any combination of these practices...

EPA Storm Water Permit Requirement for Post-Construction

NPDES Permit No. NMS000101
Page 1 of Part I

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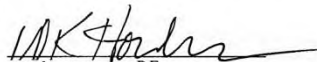
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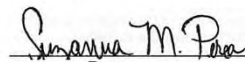
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Acting Director
Water Quality Protection Division



Samantha M. Perca
Perca

Environmental Scientist
NPDES Permits and TMDLs Branch

5.b.iii...ensure the hydrology associated with new development and redevelopment sites mimic to the extent practicable the pre-development hydrology of the previously undeveloped site, except in instances where the pre-development hydrology conflicts with applicable water rights appropriation requirements...

New Mexico OSE Rainwater/Snowmelt Policy

- OSE encourages the harvesting, collection, and use of rainwater from residential and commercial roof surfaces for on-site landscape irrigation and other on-site domestic uses.
- Should not reduce the amount of runoff that would have occurred from the site in its natural, pre-development state.

Questions and Discussion

