DEPARTMENT OF Environmental Protection STATE OF MAINE

Drinking Water Program
An Office of the Department of Health and Human Services

NEMO Maine

Maine Coastal Program

National Partnership PETE for Environmental Technology Education
Community Colleges
Tribal Colleges
Government
Industry
Building a Global Workforce

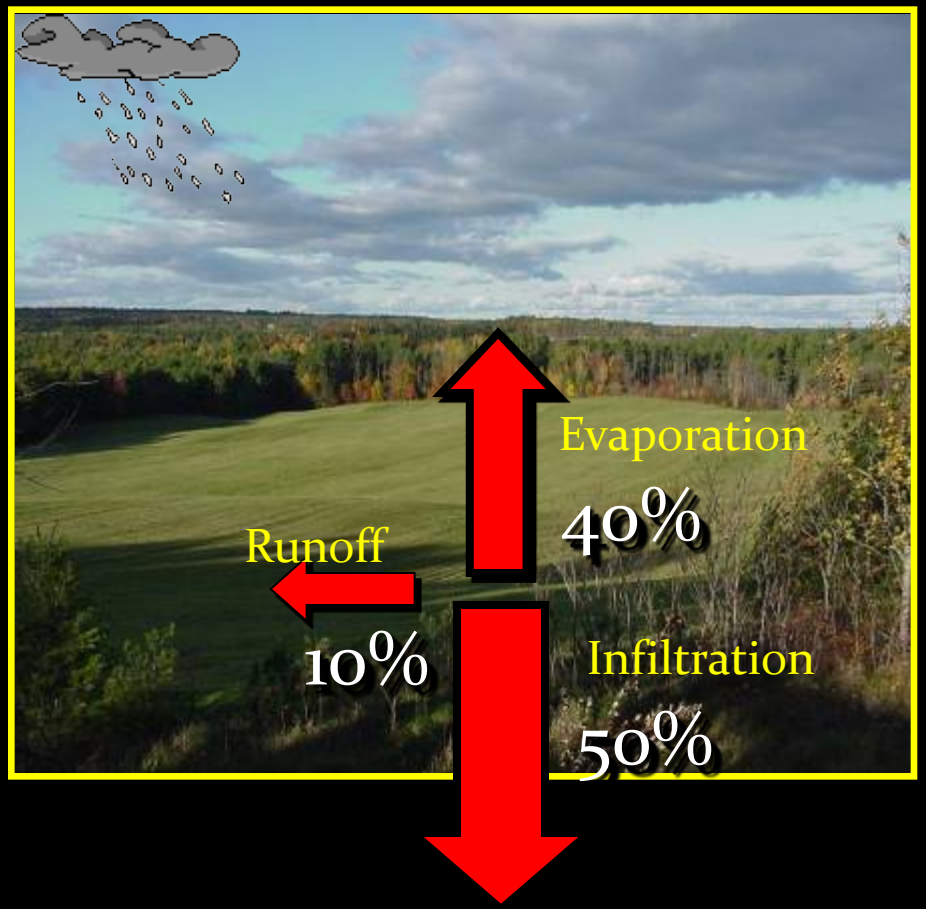
SPO Maine State Planning Office

LaMarr Clannon, Maine NEMO

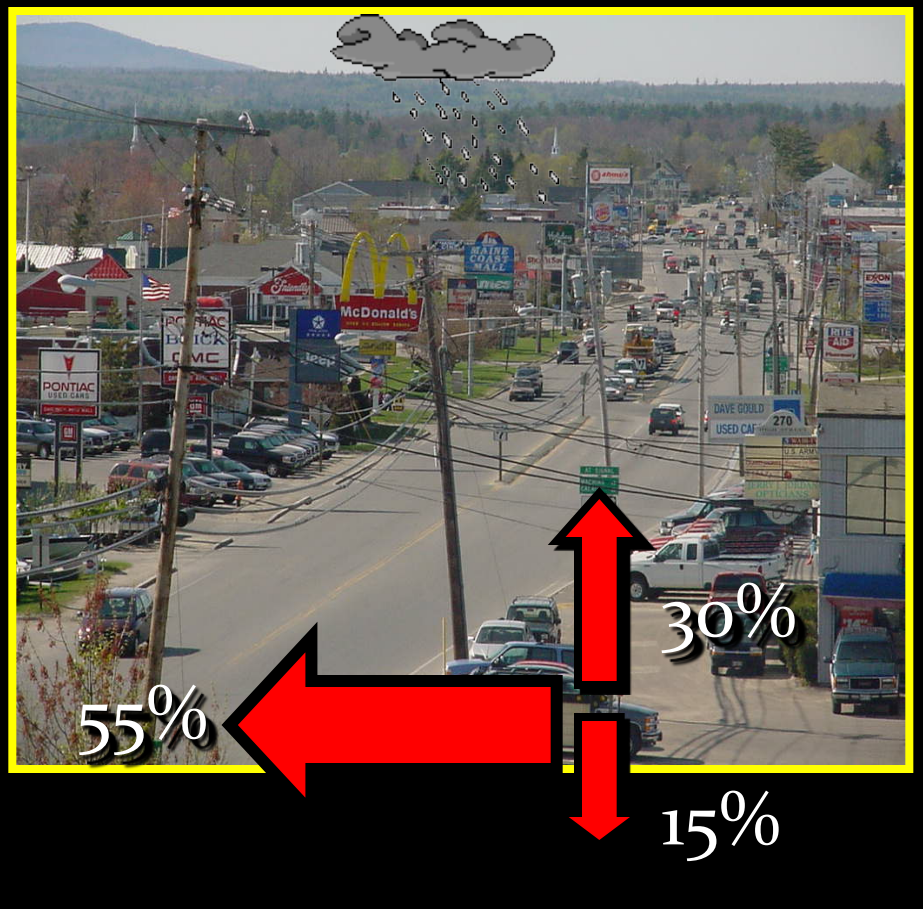
Suck It Up and Soak It In: Putting the Landscape to Work For Clean Water

Maine's Water Budget
Impacts of Development

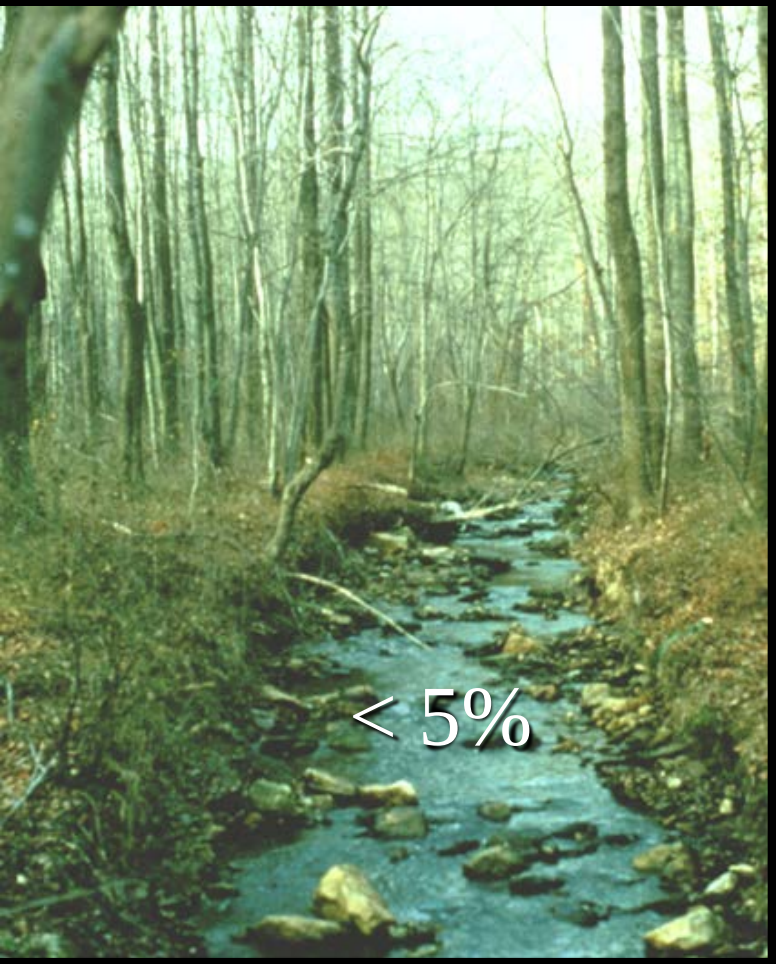
Natural Cover

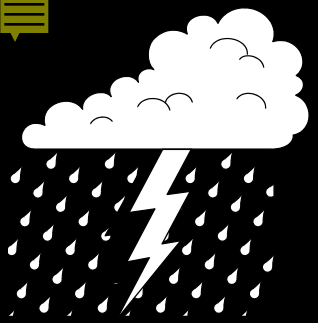


75-100% Impervious Surface



Development Affects Stream Habitat





Development Impacts on Water Quality

Increased quantity

Decreased quality

- Bacteria
- Temperature
- Nutrients
- Petroleum Derivatives
- Weed and Bug Killer
- Heavy Metals
- Chlorides
- Sediments

Traditionally, stormwater management is seen as stormwater disposal.

Traditional Development
Pushes rain off the site

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Traditional Development
Pushes rain off the site

Traditional BMP's don't work well

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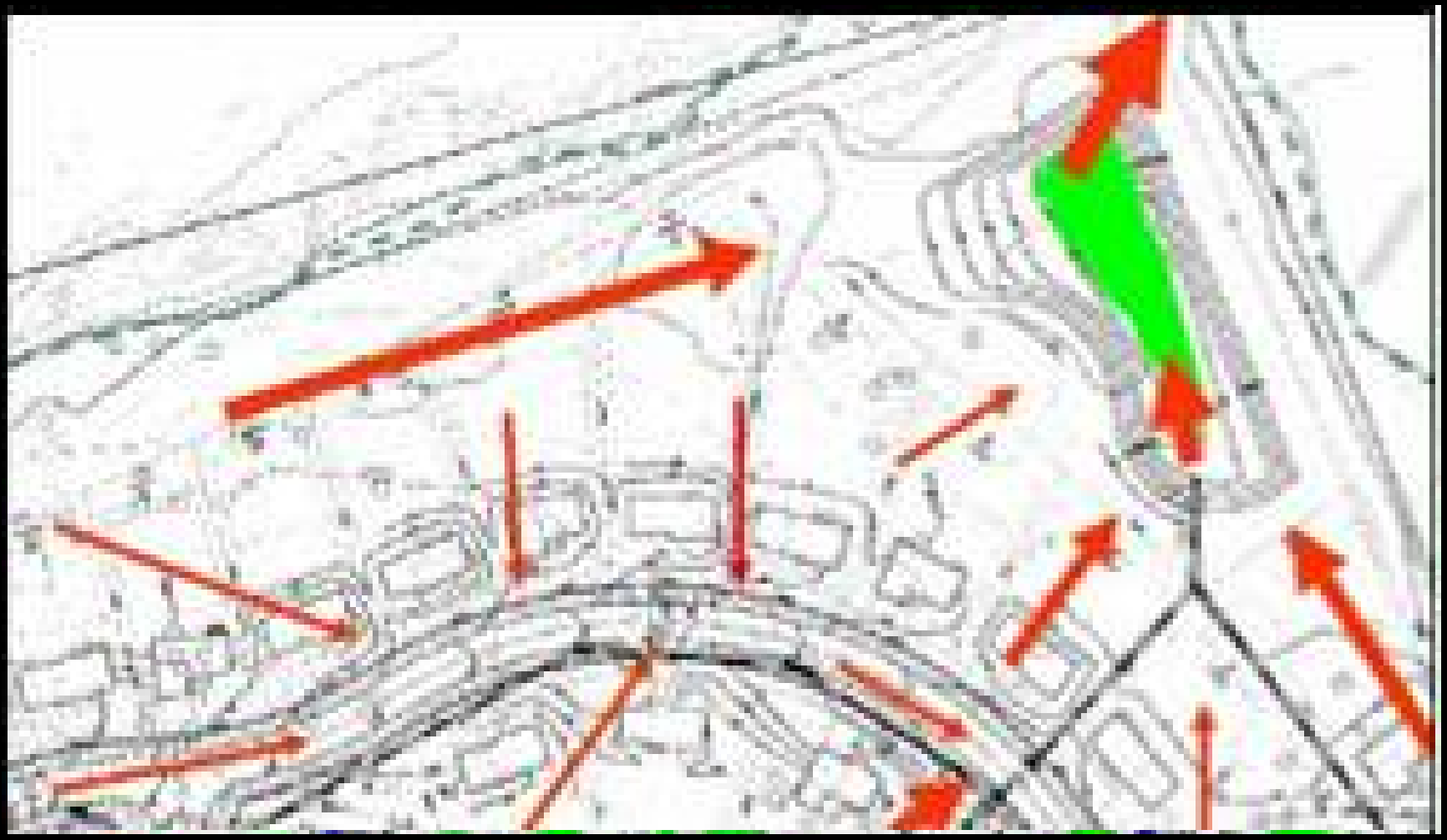
Low-Impact Development (LID)—

Try to soak rain in close to where it falls




Krispy Kreme
DOUGHNUTS


MAY 25 2001


ROCKPORT
UND TO BOSTON

Roberts Maine Grill, Kittery


OSAKA

UNH Stormwater Center

Since 2004

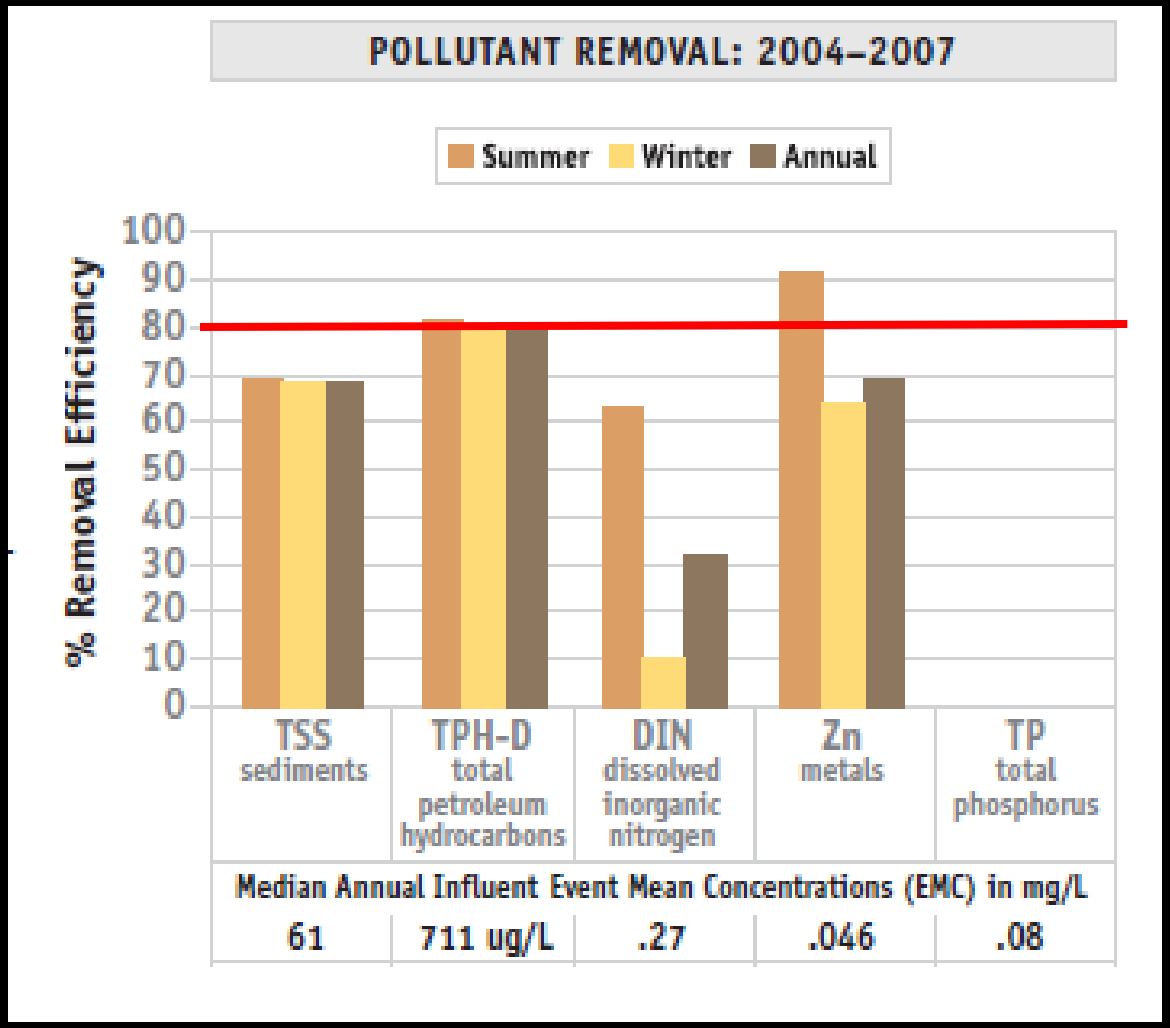
monitored the ability of 23 stormwater systems to treat pollution and reduce the volume of runoff

Conventional Systems

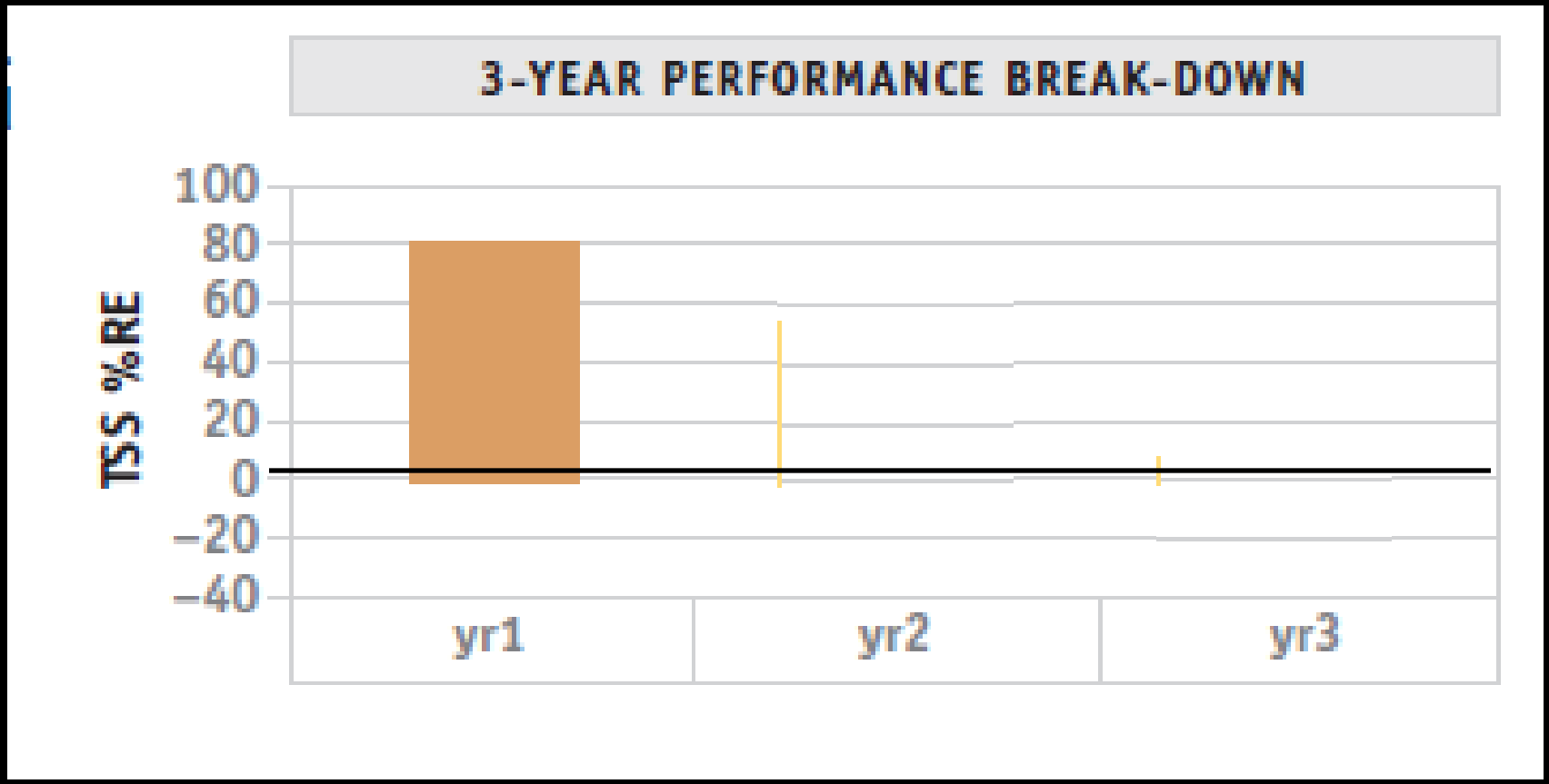
Manufactured Systems

LID Systems

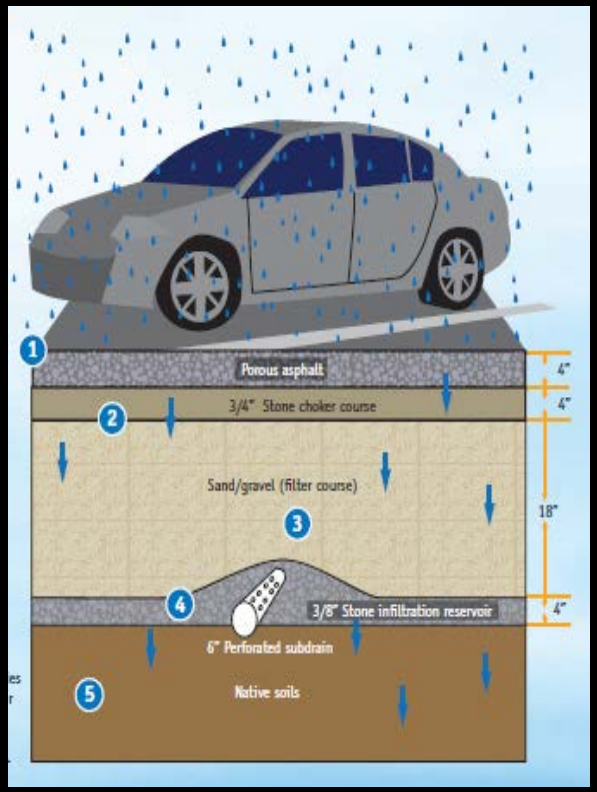
Retention Ponds $13,500/acre

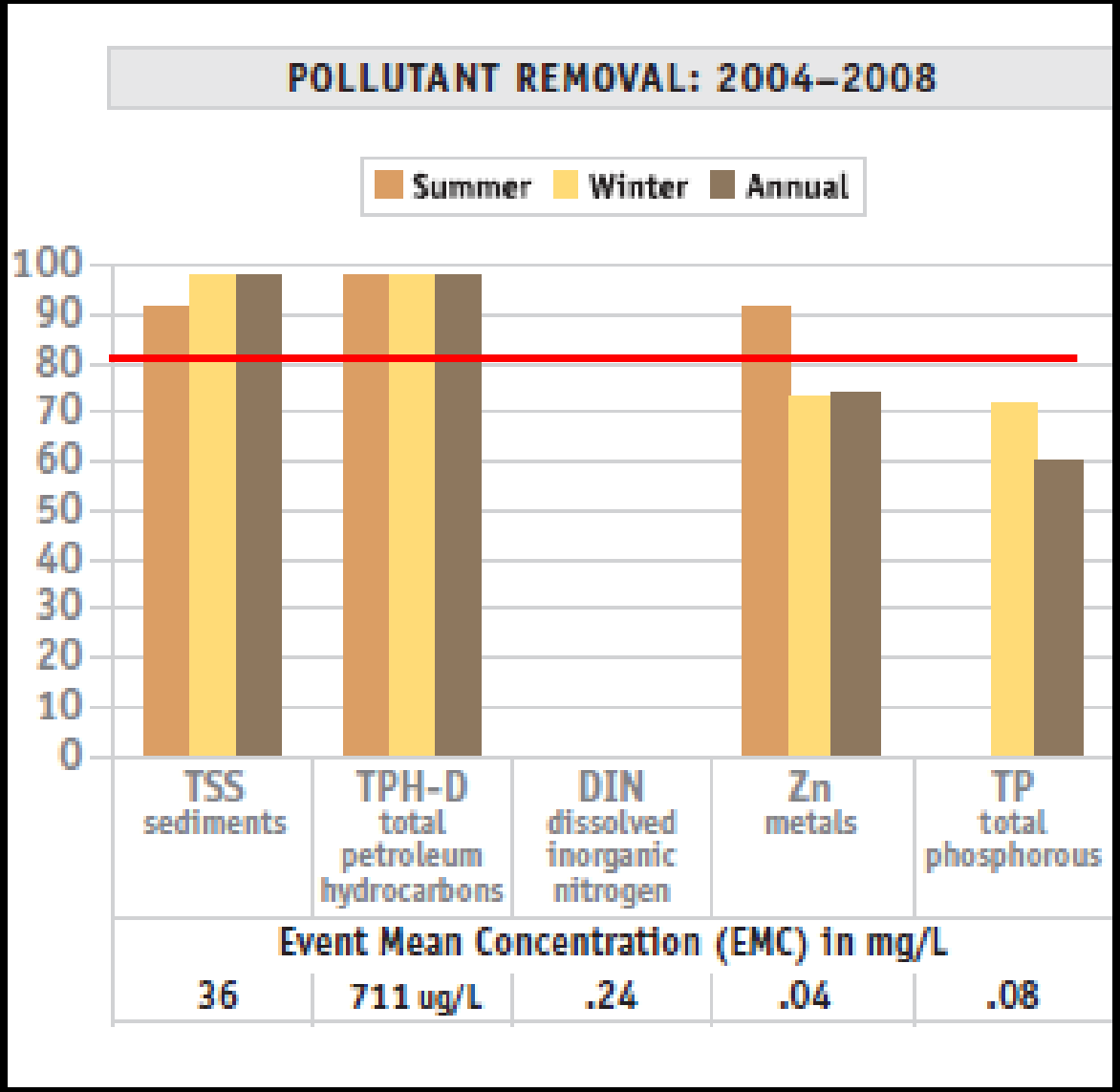


Retention Ponds



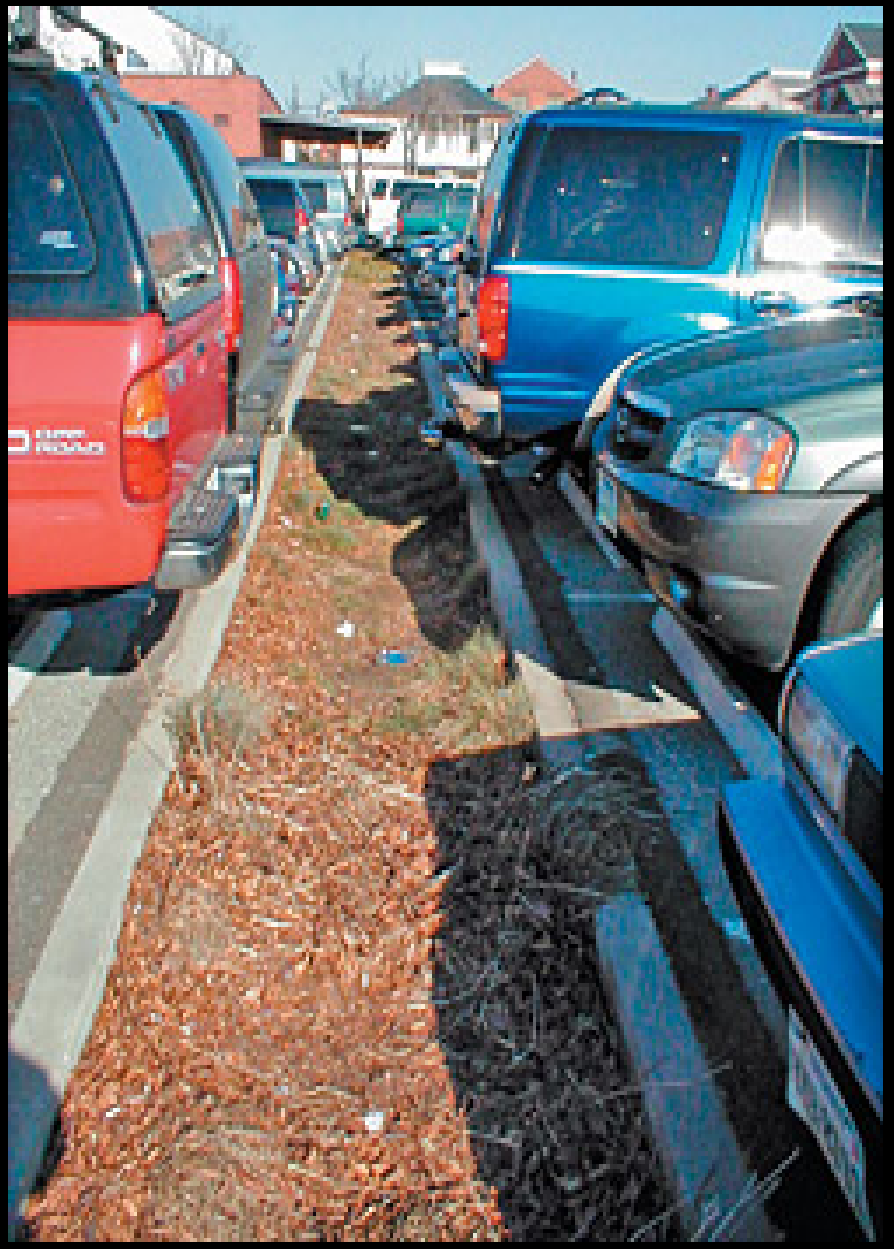
Porous Asphalt 2008 $2.80 sf ($2.25)



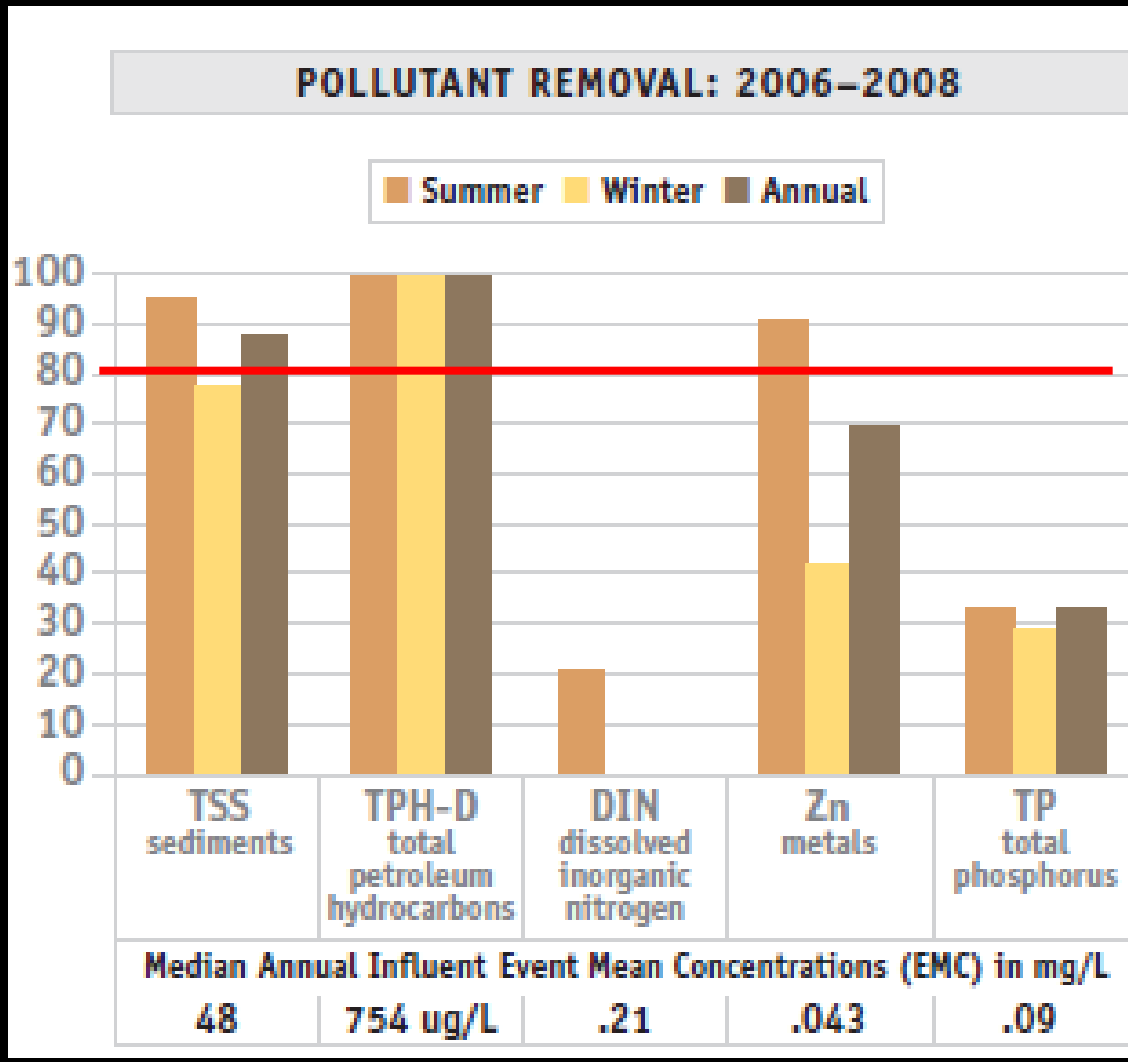



335

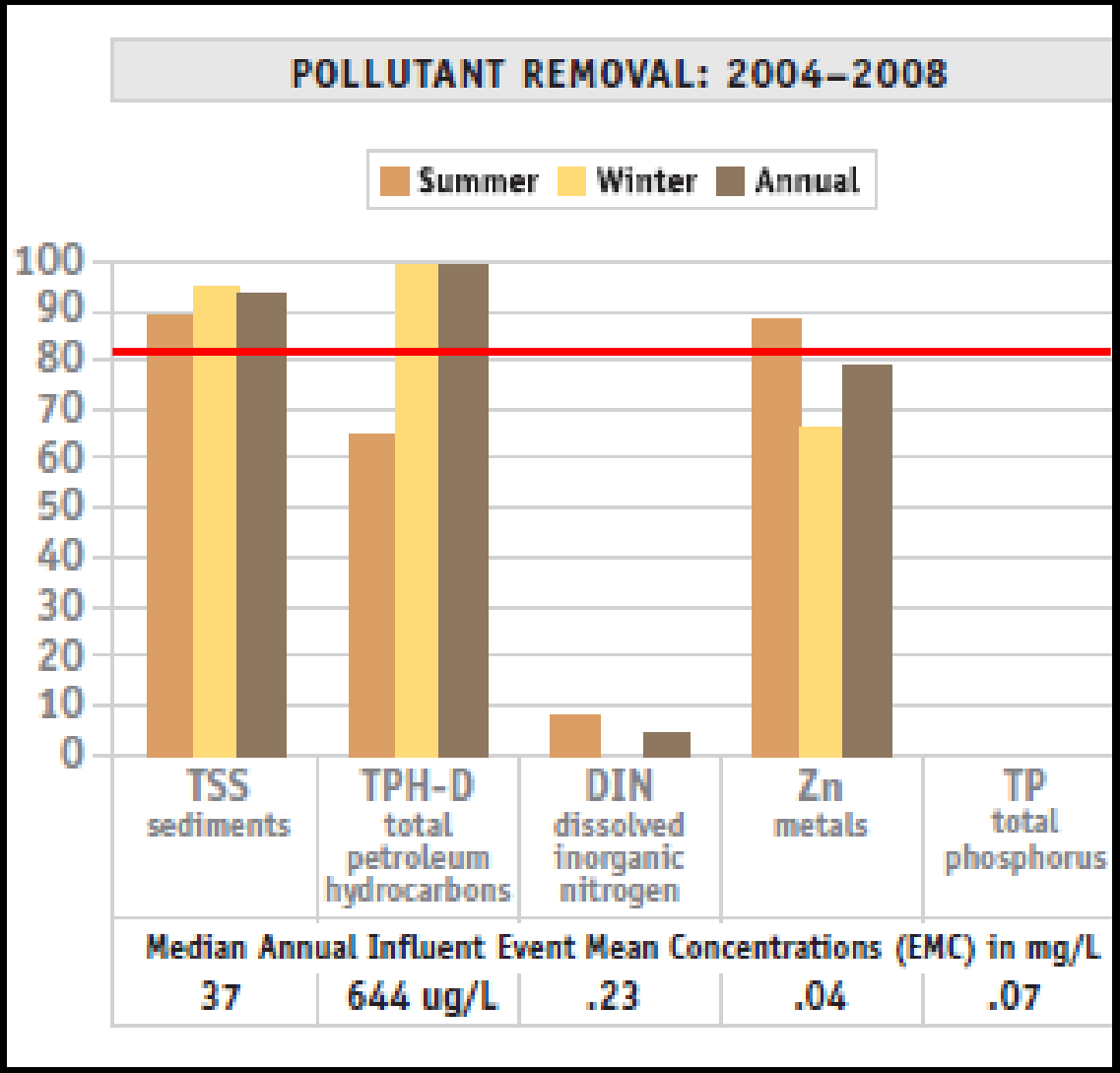

31 3:38PM



Bioretention Systems $18,000/acre

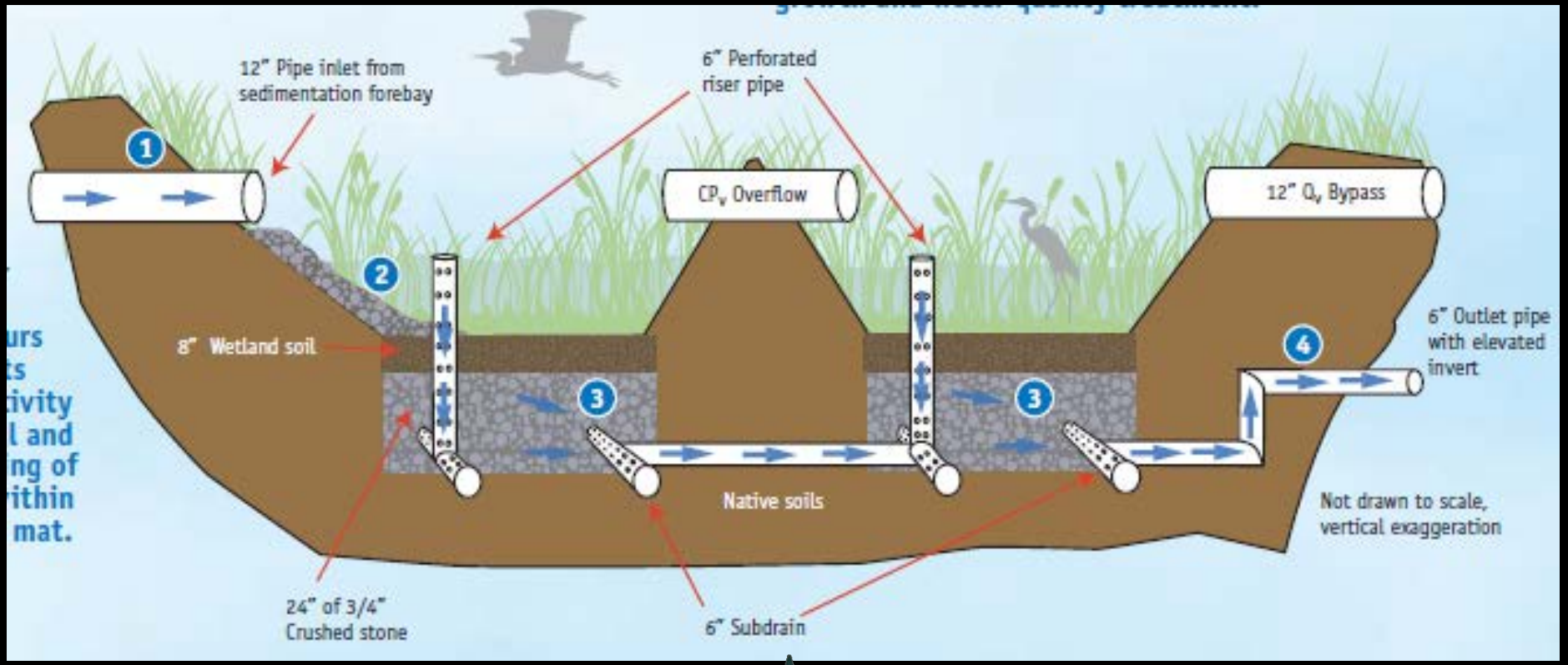


Tree Box Filter $3000 each (10/acre)

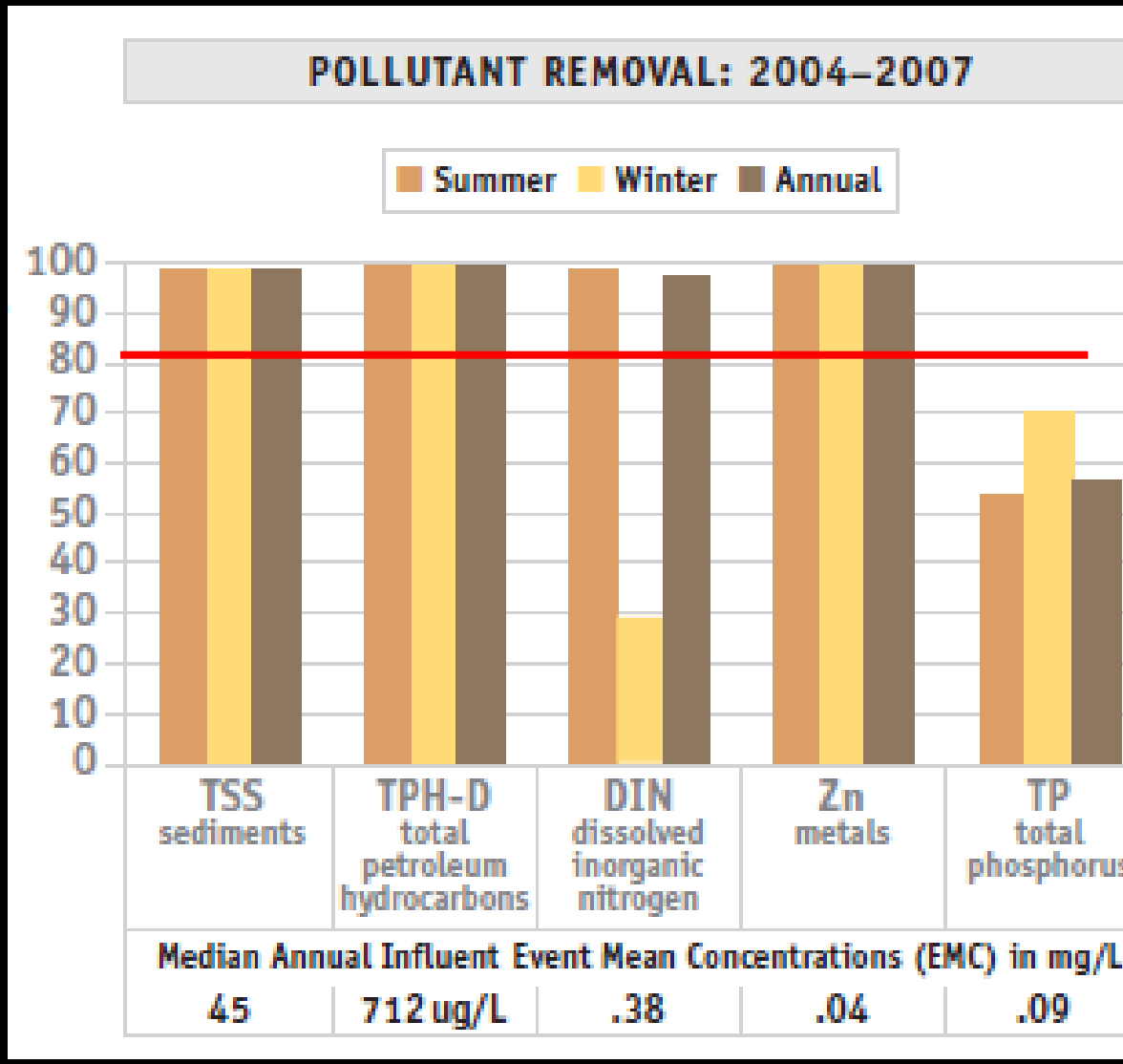


Subsurface Gravel Wetland $22,500/acre

Subsurface Gravel Wetland



Subsurface Gravel Wetland $22,500/acre



Saving $$ with LID

Forging The Link Study

- UNH Stormwater Center
- Virginia Commonwealth University
- Antioch University NE

Many Communities are struggling with the costs of treating stormwater runoff

Slide: Pembroke Maryland , Chesapeake NEMO

25% Savings

Slide: Chesapeake

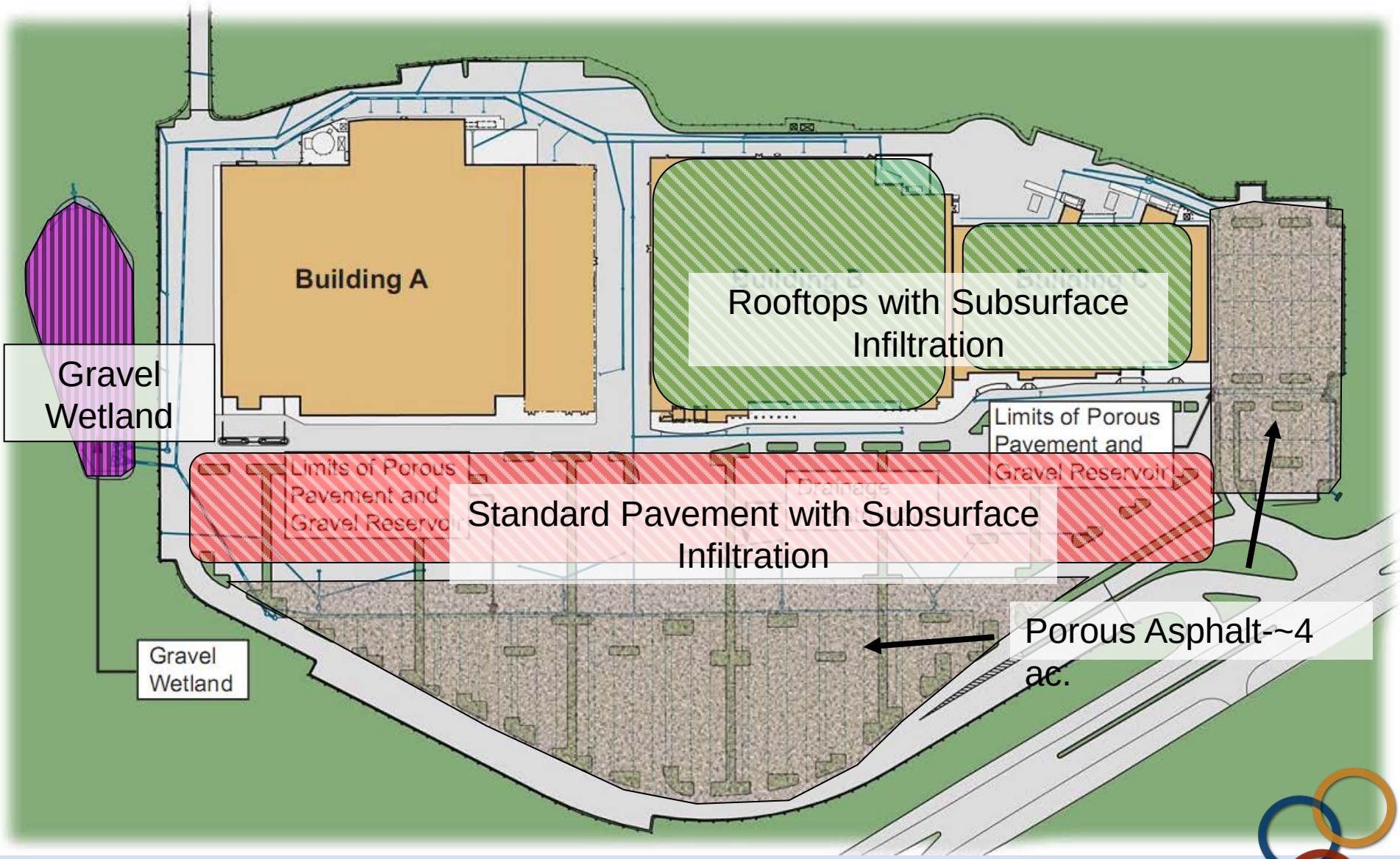
Boulder Hills, NH

Boulder Hills, NH

$5,000 in Site Preparation
$72,000 Drainage
$6,500 Curbing Reductions
$19,500 Permanent Erosion Control

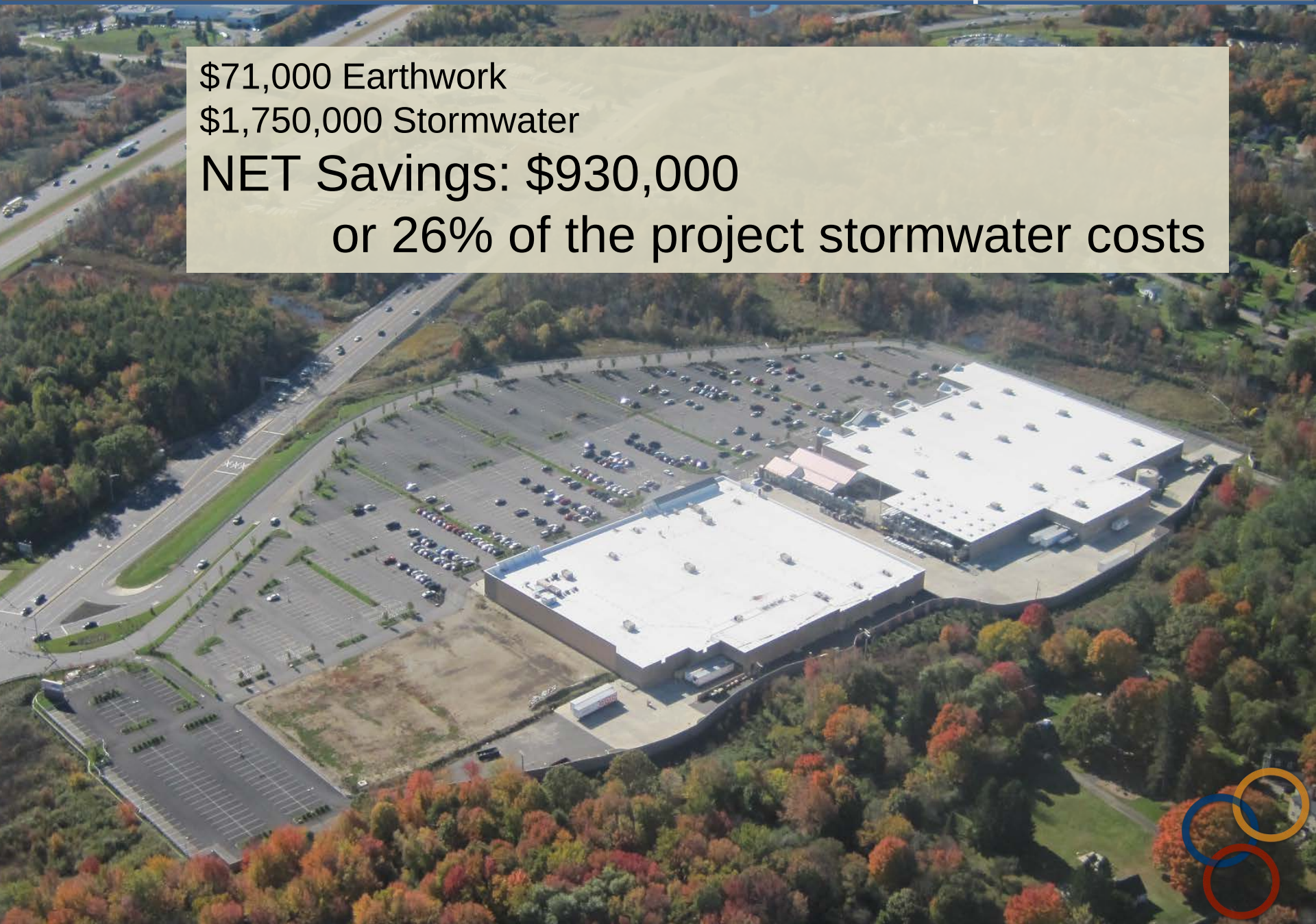
NET Savings: $50,000
approx 6% of the total project

Greenland Meadows Commercial Development, NH



Greenland Meadows Commercial Development, NH

Greenland Meadows Commercial Development, NH



$71,000 Earthwork
$1,750,000 Stormwater

NET Savings: $930,000

or 26% of the project stormwater costs

Most still didn't know how to use the tools

Back Cove Rain Garden

Porous concrete York Hospital

Northgate Plaza

Ocean Ave Elementary

Augusta Hannaford

Ellsworth Middle School

Rockland Green roof

Woodard and Curran

Maine Mall Porous Pavement

Long Creek Tree Box Filter

Kittery Downspout

Portland Raingarden

Belgrade Pavers

Turf reinforcement

Awesome things can happen in small spaces

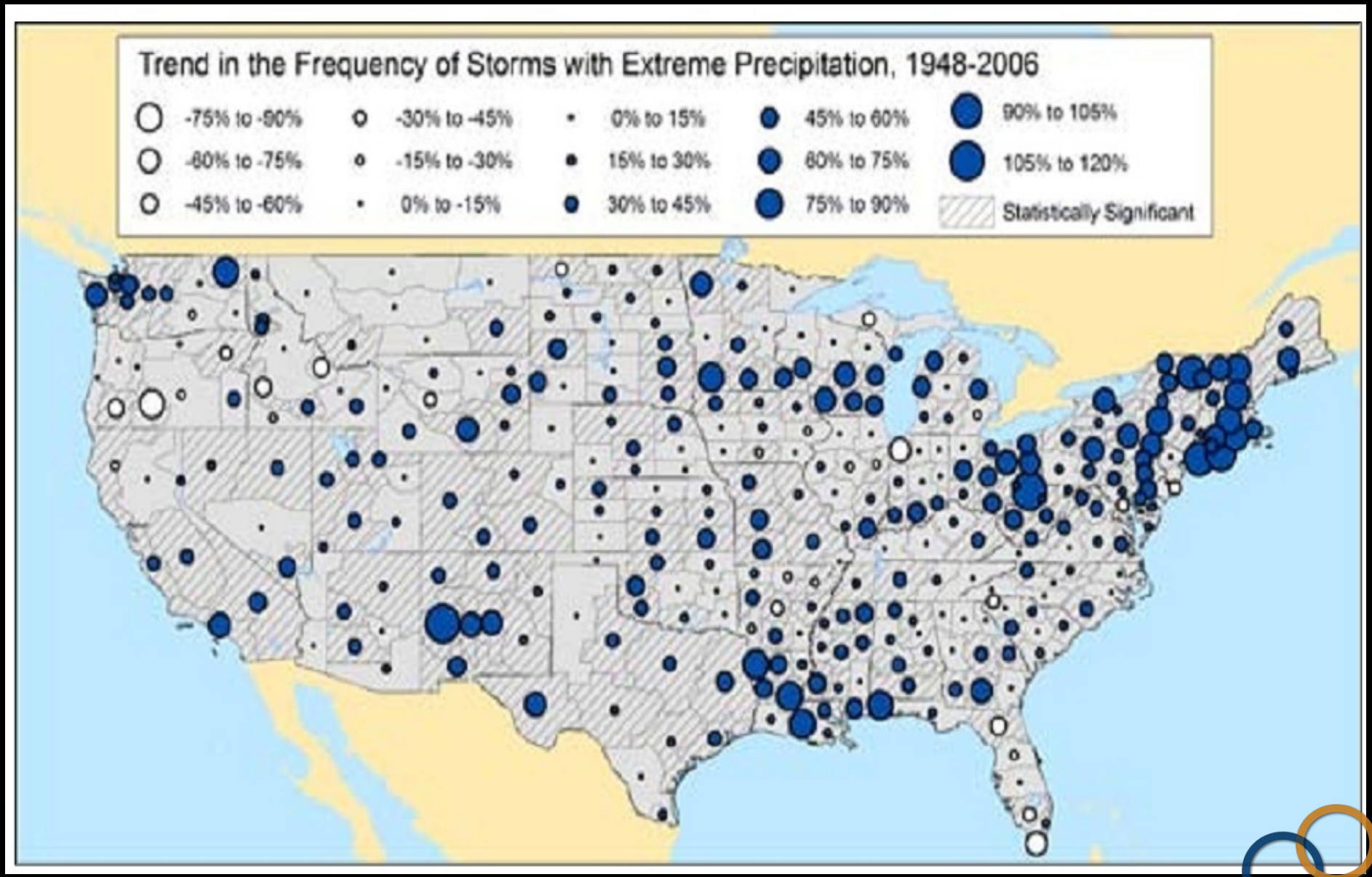
Gravel Grass

Parking stall paved with gravel grass - ready to be put to good use

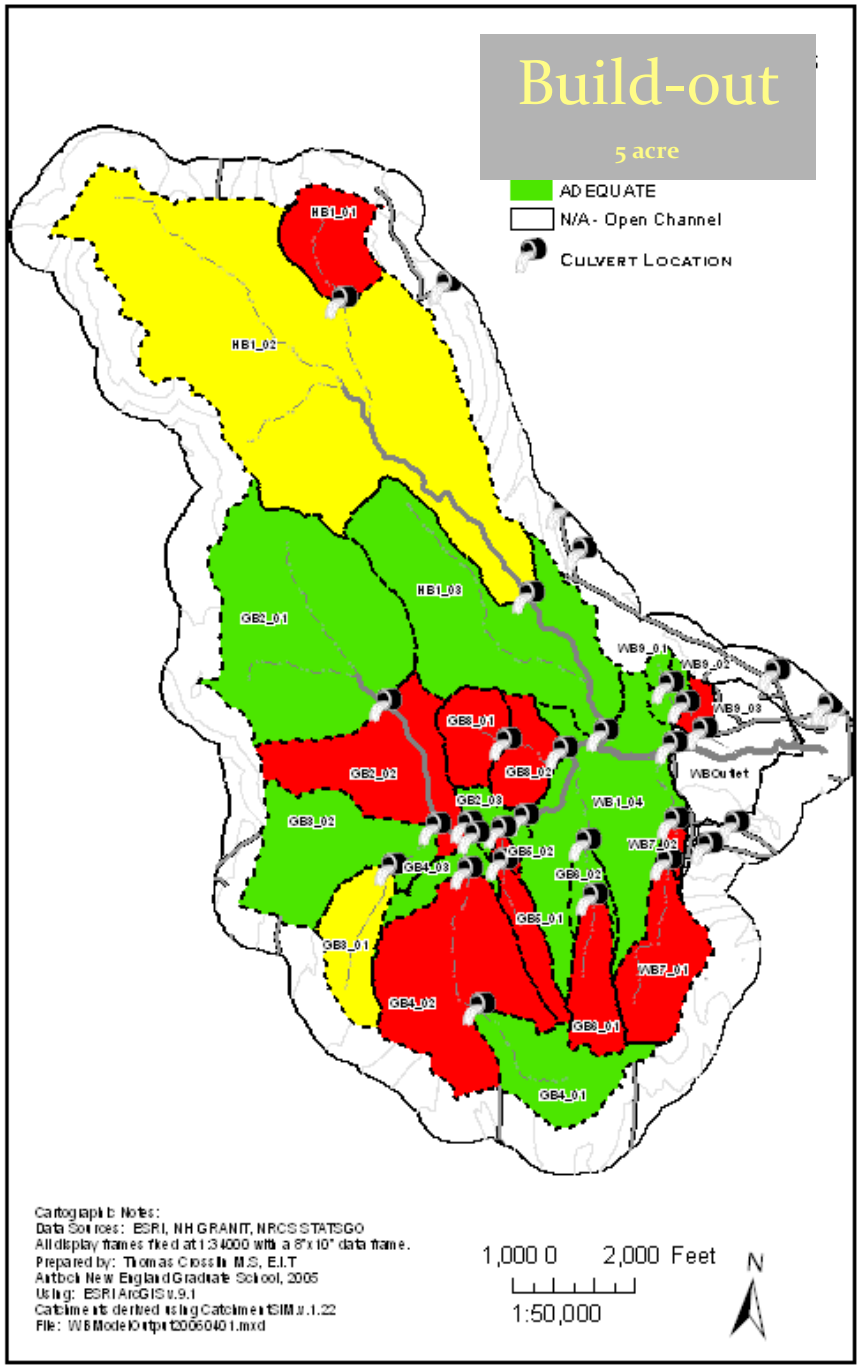

cus de la fleur, 2007


Marcus de la fleur, 2007

Changing Trends



Gardiner Spring 2011


Build-out
5 acre
ADEQUATE
N/A - Open Channel
Culvert Location
HB1_01
HB1_02
HB1_03
GB2_01
GB8_01
GB2_02
GB8_02
GB2_03
GB3_02
GB5_02
GB4_03
GB8_02
GB5_01
GB3_01
GB4_02
GB8_01
GB4_01
WB9_01
WB9_02
WB9_03
WBOutlet
WB1_04
WB7_02
WB7_01
Cartographic Notes:
Data Sources: ESRI, NH GRANIT, NRCS STATSGO
All display frames fixed at 1:34000 with a 8"x10" data frame.
Prepared by: Thomas Crossin M.S., E.I.T
Antioch New England Graduate School, 2005
Using: ESRI ArcGIS v.9.1
Catchments derived using CatchmentSIM v.1.22
File: WBModelOutput20060401.mxd
1,000 0 2,000 Feet
1:50,000
N

Community Resiliency and Infrastructure

Projected Culvert Replacement $28,000

Cost to repair $93,000

York Ordinance language 2007

- Low Impact Design. Each applicant is *required* to *submit a statement* to the Planning Board *documenting proposed* Low Impact Design (LID) *for the site*, which will help to reduce stormwater volumes and help to enhance stormwater quality. LID includes, but *is* not limited to green roofs, rain gardens, tree wells, infiltration basins, and permeable pavement. The applicant shall submit technical documentation about the suitability of such designs with the request for LID features.

LID creates unique opportunities








CVS/pharmacy



CVS/pharmacy


PREMIER CONCRETE
CONSTRUCTION
11.30.2007

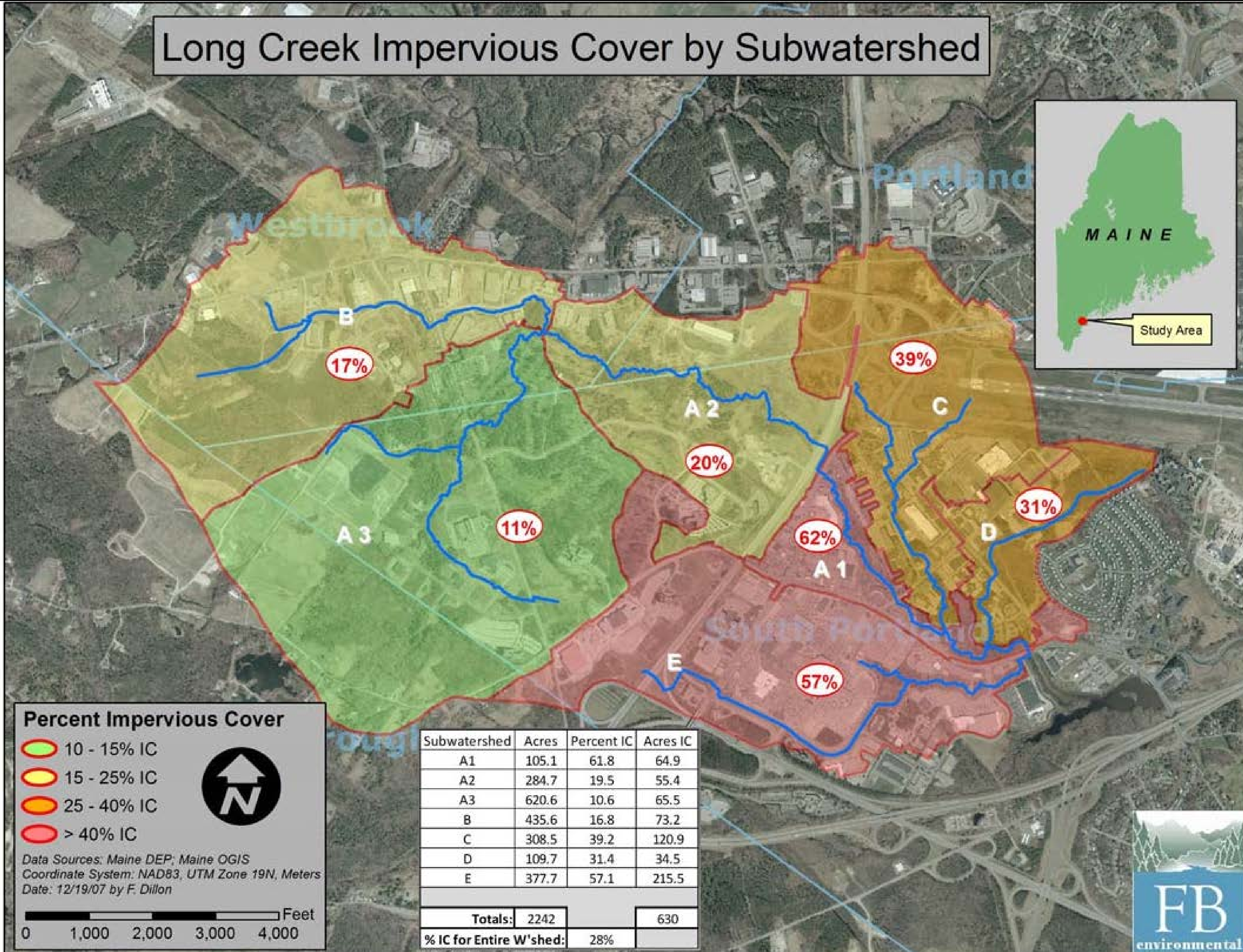

CVS/pharmacy

"Concept Only – Needs Design Review"

Long Creek Story

- It's Bad…verry verry BAD!!!

Urban Impaired Stream:
Can not contribute to impairment of a listed stream.



Subwatershed	Acres	Percent IC	Acres IC
A1	105.1	61.8	64.9
A2	284.7	19.5	55.4
A3	620.6	10.6	65.5
B	435.6	16.8	73.2
C	308.5	39.2	120.9
D	109.7	31.4	34.5
E	377.7	57.1	215.5
Totals:	2242		630
% IC for Entire W'shed:		28%	

Businesses pay $3000 / acre /year

- Threat of litigation
- 3 years to plan and fund
- Retrofit is expensive
- Monitoring is expensive
- Will this work?

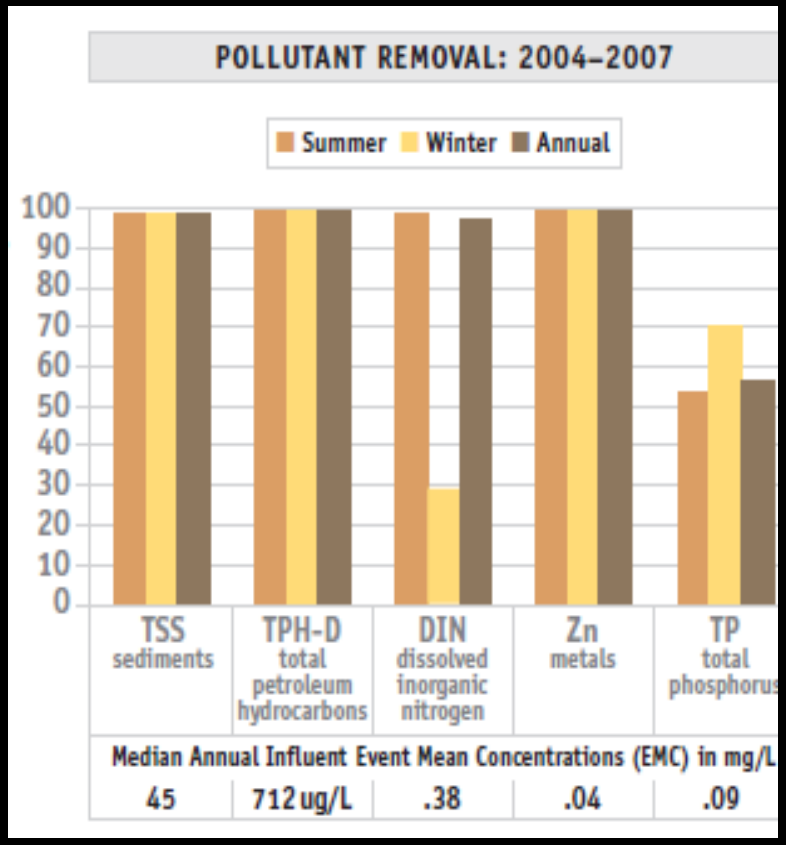
Total Price Tag ……15 million???

Business Wants Stability

- We know what causes majority of the problem

Business Wants Stability

- We know the most effective treatments



Even the playing field

- Many of the MS4 communities want to implement similar LID requirements to avoid confusion
- Scarborough
- Biddeford
- South Portland

Protect Opportunities for Future Business Owners