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Title:	Individual Permit for Stormwater Public Update December 2012
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Intended for:	Individual Permit for Stormwater Public Update, 2012-12-13 (Los Alamos, New Mexico, United States) Environmental Programs

Individual Permit for Stormwater

Public Update

December 2012

Scope of Meeting

- **Purpose of this meeting**
  - Share information
  - Project status
  - Not designed to include
    - Discussions about the scope of the permit
    - LANL's programmatic priorities
- **Focus is on permit compliance actions**
- **A Q&A sessions**
  - after the LANL presentations
  - after all presentations if time allows

General Ground Rules

- Please wait until the scheduled time to provide comments or to ask questions
- Please identify yourself before speaking
- Please keep your questions short
  - remember there may be others waiting to ask questions
- Please honor the process by keeping questions and comments civil and by using appropriate language
- Please yield the floor if requested by the facilitator
- Please help the participants and facilitator ensure that the agenda content and timeframes are met

Agenda

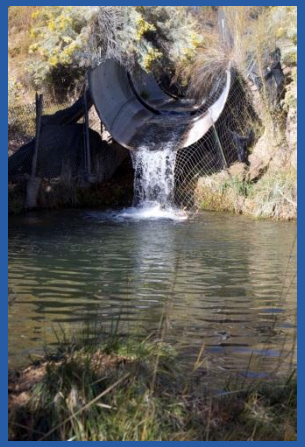
Time	Subject	Speaker
5:30	View Posters	
5:35	Meeting opening	Bruce MacAllister
	Introduction	Dave McInroy
	Individual Permit Overview	Steve Veenis
5:50	Data Results for 2012	Armand Groffman
6:05	Enhanced Controls Installation	Jeff Walterscheid
6:20	Designing for Total Stormwater Retention	Bill Foley
6:40	Low-Impact Design for Stormwater Management	Rachel Conn Erin English
7:00	Integrated Stormwater Approach in Upper Sandia Canyon	Debbie Apodaca Pesiri
7:20	Alternative Compliance	Steve Veenis
7:30	Meeting end	

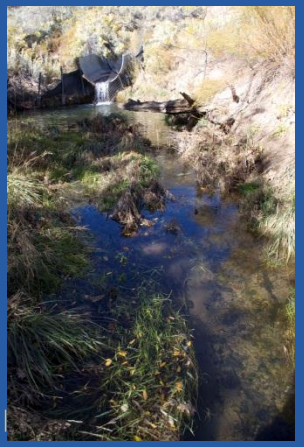
Introduction

LANL Individual Permit
Public Meeting
December 13, 2012

Dave McInroy
Environmental Cleanup
Program Director

Welcome





Individual Permit
Public Involvement Activities

IP Public Website

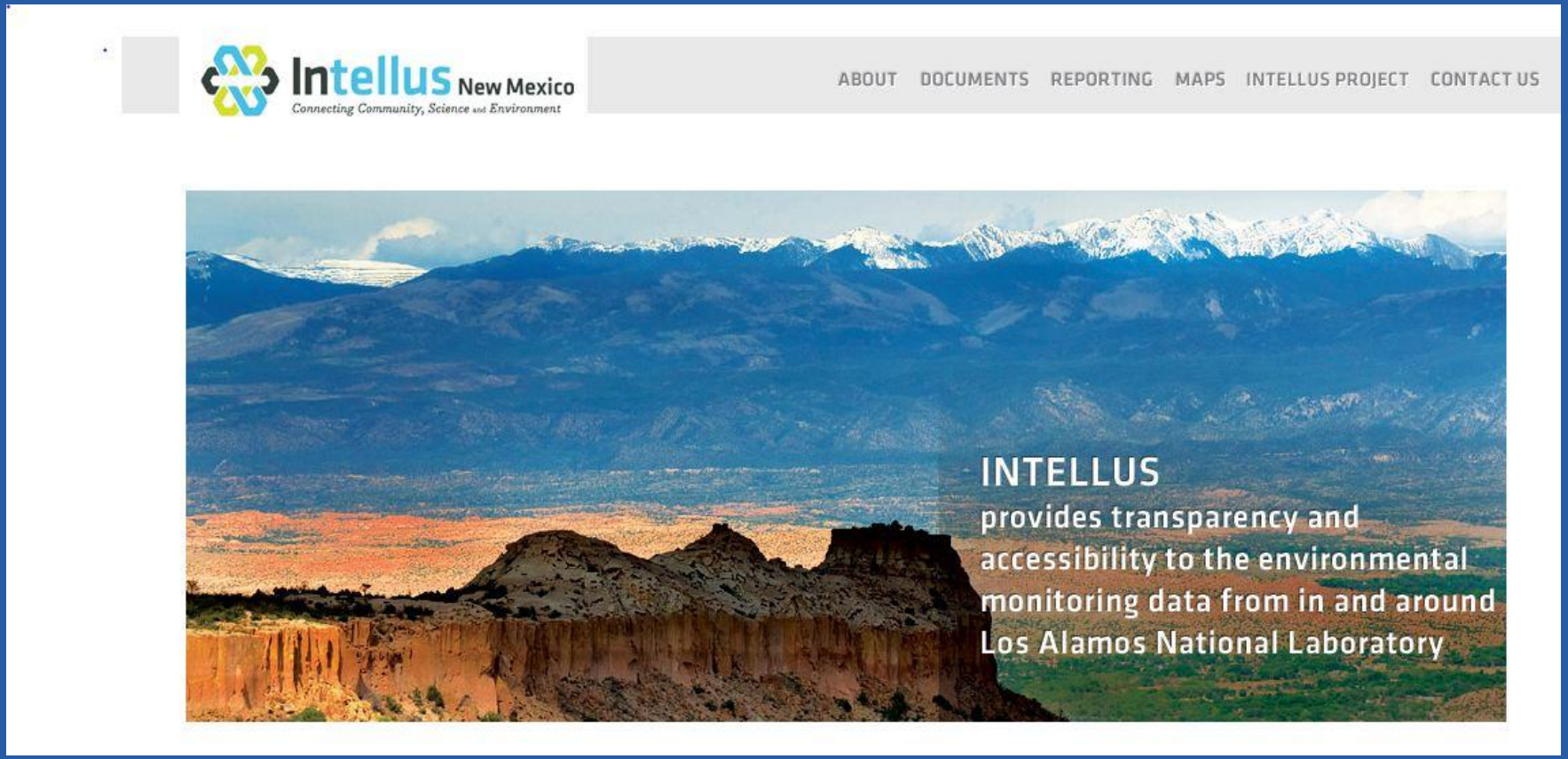
http://www.lanl.gov/environment/

E-mail Notifications

Public Meetings twice per year

Intellus Website for Environmental Data

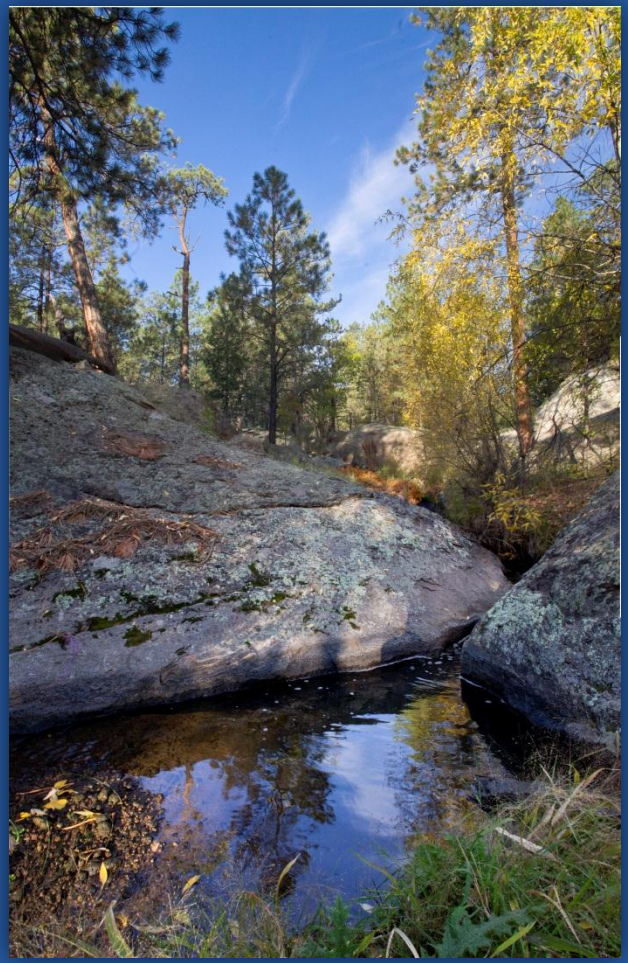
www.intellusnmdata.com



Individual Permit Commitments

We are committed to:

- **Improving environmental protection and stewardship**
- **Mitigating transport of legacy contaminants by stormwater**
- **Ongoing implementation of Permit requirements**
- **Meeting permit milestones**
- **Sharing results with the public**
- **Incorporate feedback from stakeholders**

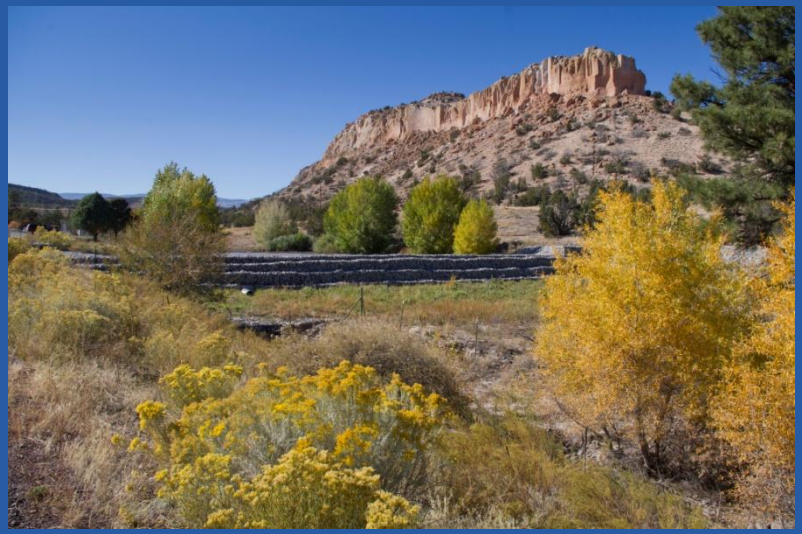


Project Overview

Steve Veenis

Individual Permit Project Overview

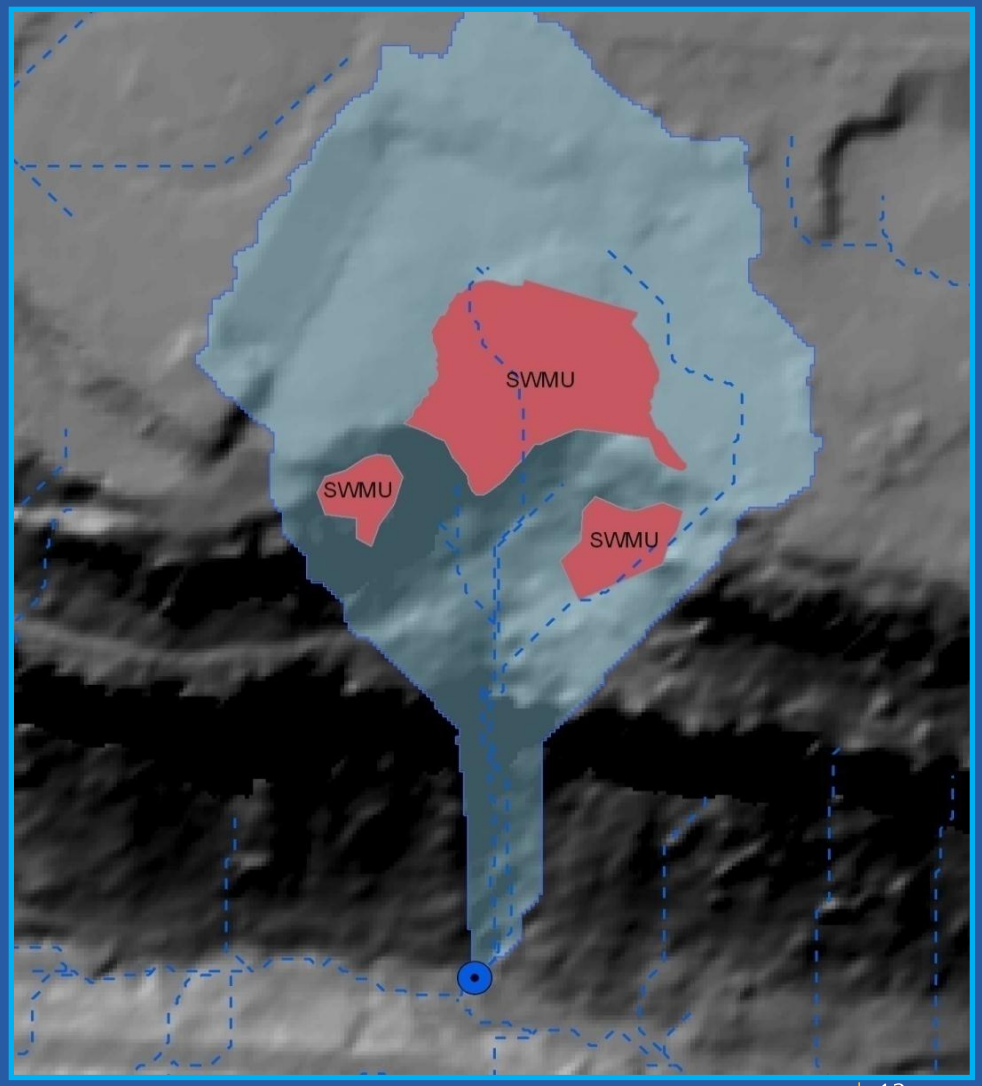
- Permit Issued – November 1, 2010 (5 year Permit Cycle)
  - 405 Solid Waste Management Units (SWMU)/Areas Of Concern (AOC)
- Installation of Baseline Control Measures complete (May 2011)
- Collect storm water samples at 250 Surface Monitoring Areas (SMAs)
  - >Target Action Levels (TALs) - Initiate Corrective Action
- Annual Reporting
- Public Involvement



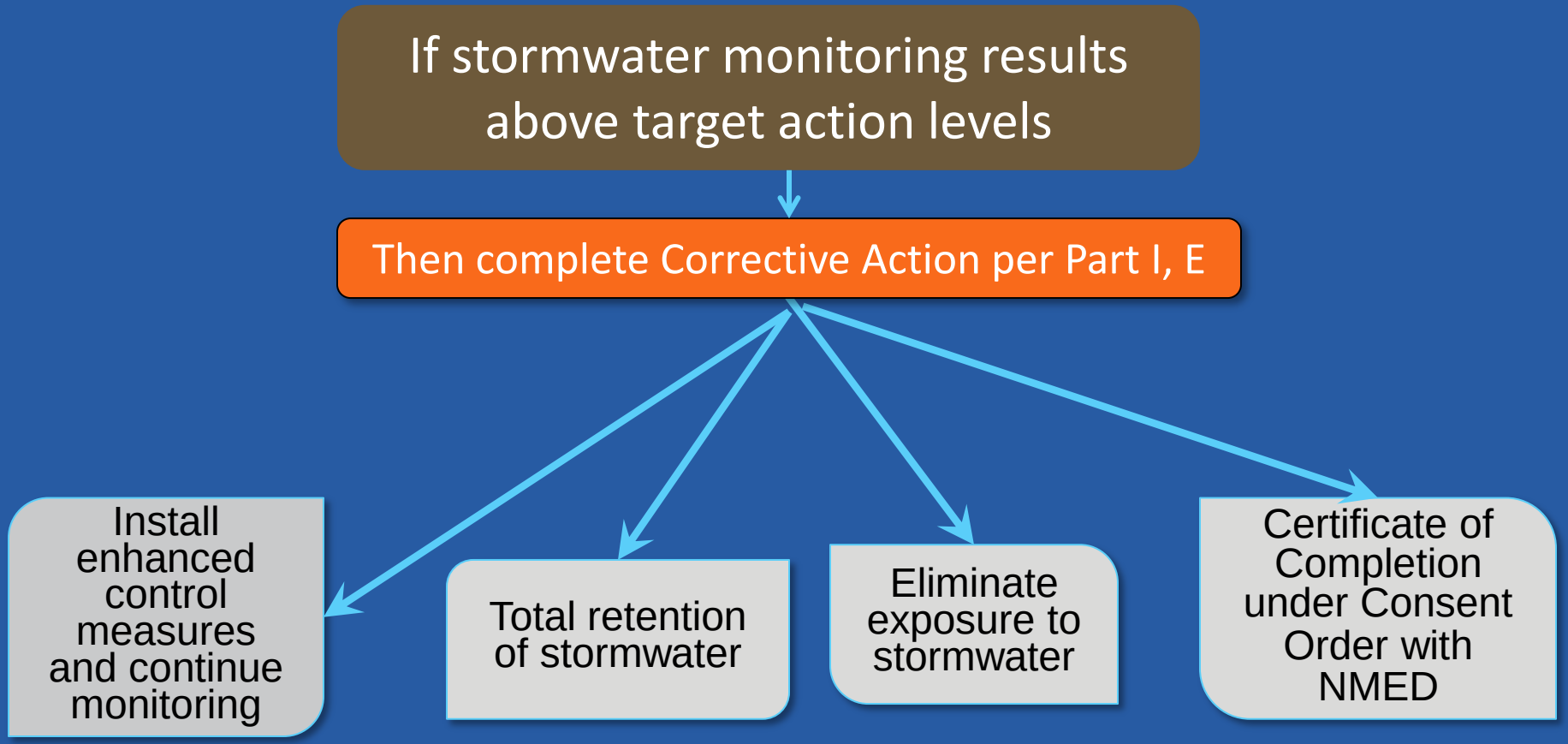
IP Surface Monitoring Area (SMA)

IP regulates point source discharges of storm water from SWMUs and AOCs

1. **Discharges must be from SWMUs or AOCs**
2. **Significant industrial materials must be exposed to storm water**
3. **Must have potential to discharge to receiving waters**



IP Corrective Action Options



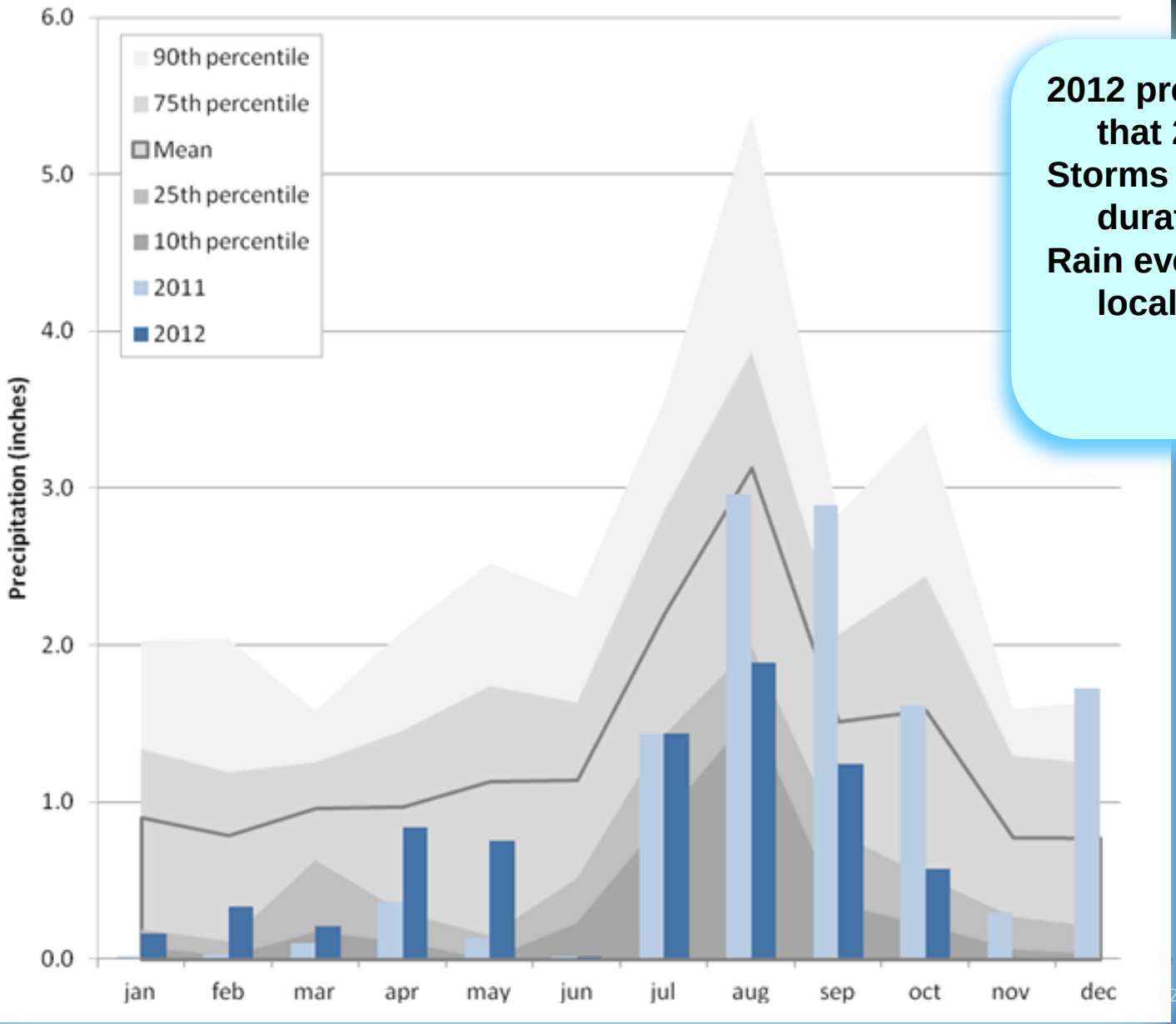
Individual Permit Project Overview

- **IP Compliance**
  - 45 Corrective Actions completed and certified
  - Deliverables submitted on schedule
  - Inspection/Maintenance
  - Monitoring
    - Drought condition impacts
    - Corrective Action has been initiated at approximately 1/3 of Sites
- **Public Involvement**
  - 4th public meeting
  - 5 technical meetings with Western Environmental Law Center (WELC)
  - Public website
- **Process Improvements**
  - Telemetry upgrades
  - Precipitation network enhancements
  - Field processes

2012 Monitoring Season Annual Update

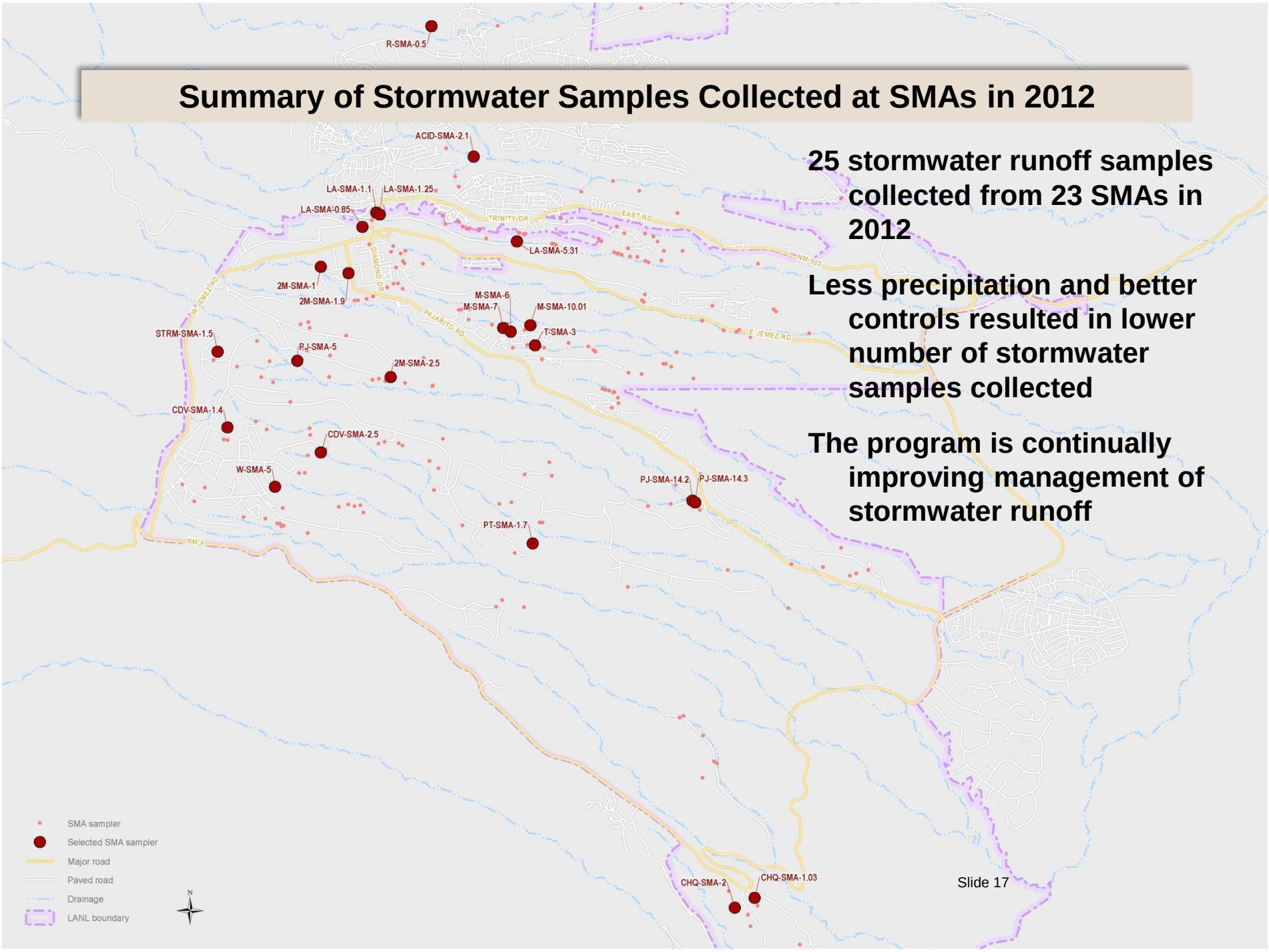
Armand Groffman

2012 Precipitation



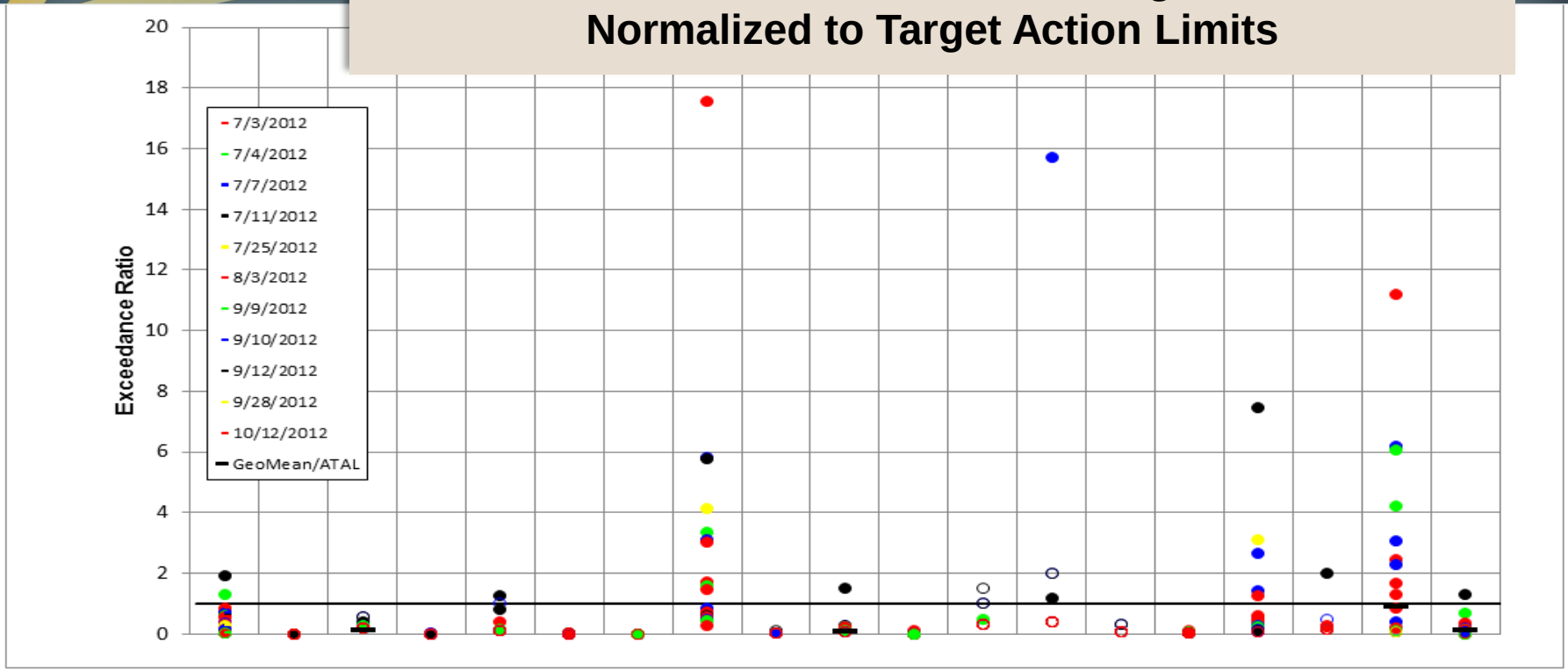
2012 precipitation less that 2011
Storms were shorter in duration
Rain events are very localized

Summary of Stormwater Samples Collected at SMAs in 2012



- 25 stormwater runoff samples collected from 23 SMAs in 2012
- Less precipitation and better controls resulted in lower number of stormwater samples collected
- The program is continually improving management of stormwater runoff

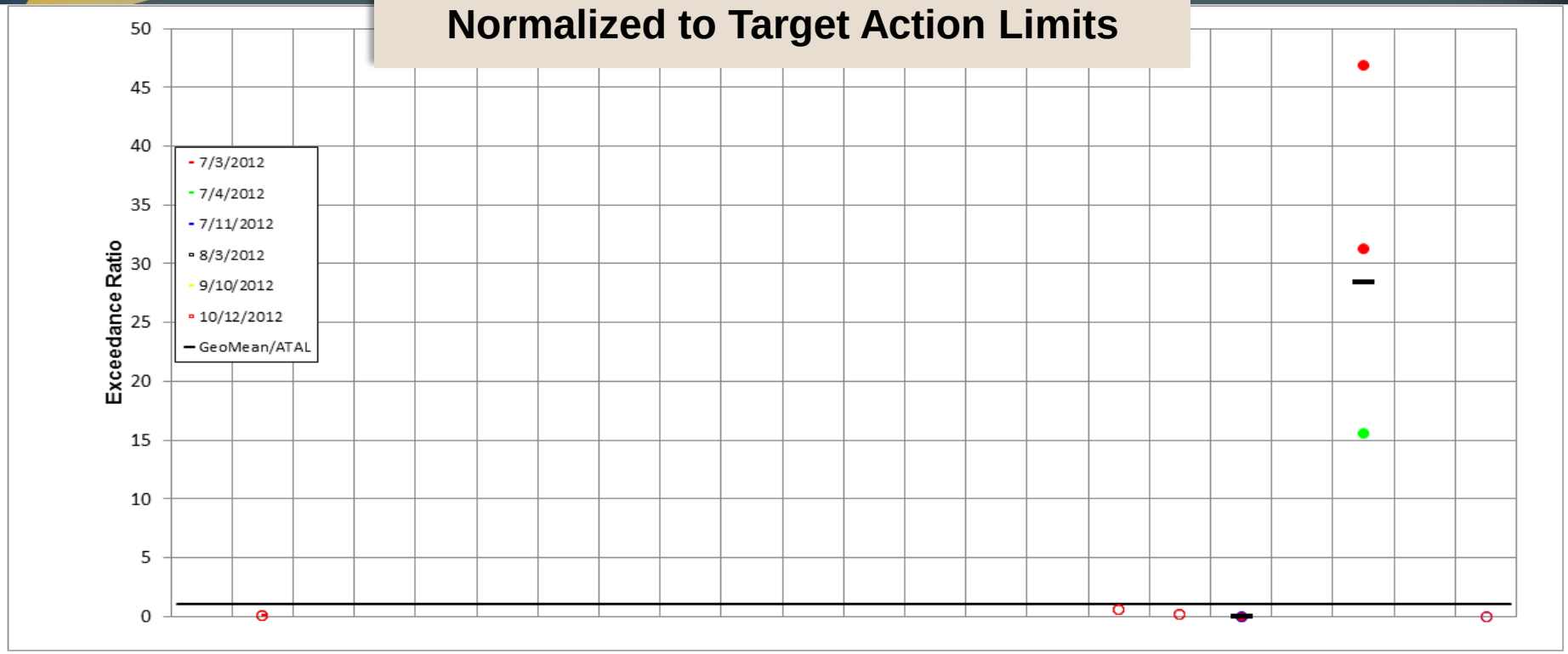
2012 Metals and Rad Monitoring Results Normalized to Target Action Limits



	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Cyanide, weak acid dissociable	Gross alpha	Radium-226 and Radium-228
std used in ratio calculations	MTAL	ATAL	ATAL	ATAL	MTAL	MTAL	ATAL	MTAL	MTAL	ATAL	MTAL	ATAL	MTAL	ATAL	ATAL	MTAL	ATAL	ATAL	ATAL
std value	750	640	9	5000	1	210	1000	4.3	17	0.77	170	5	0.5	6.3	100	42	0.01	15	30
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	pCi/L	pCi/L

$$\frac{\text{Result}}{\text{TAL}} = \text{TAL Exceedance Ratio}$$

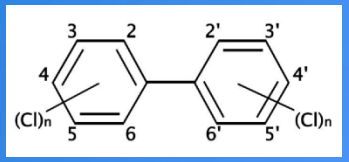
2012 Organic Monitoring Results Normalized to Target Action Limits



	Aldrin	Benzo(a)pyrene	BHC[gamma-]	Chlordane (alpha/gamma)	Chlordane[alpha-]	Chlordane[gamma-]	DDD[4,4'-]	DDE[4,4'-]	DDT[4,4'-]	Dieldrin	Endosulfan I	Endosulfan II	Endrin	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Pentachlorophenol	RDX	Tetrachlorodibenzo dioxin[2,3,7,8-]	Total PCB	Toxaphene (Technical Grade)	Trinitrotoluene [2,4,6-]
std used in ratio calculations	-	ATAL	-	-	-	-	-	-	-	-	-	-	-	-	-	ATAL	MTAL	ATAL	-	ATAL	-	ATAL
std value	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5	19	200	-	0.0006	-	20
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

$$\frac{\text{Result}}{\text{TAL}} = \text{TAL Exceedance Ratio}$$

2012 TAL Exceedances



PCBs

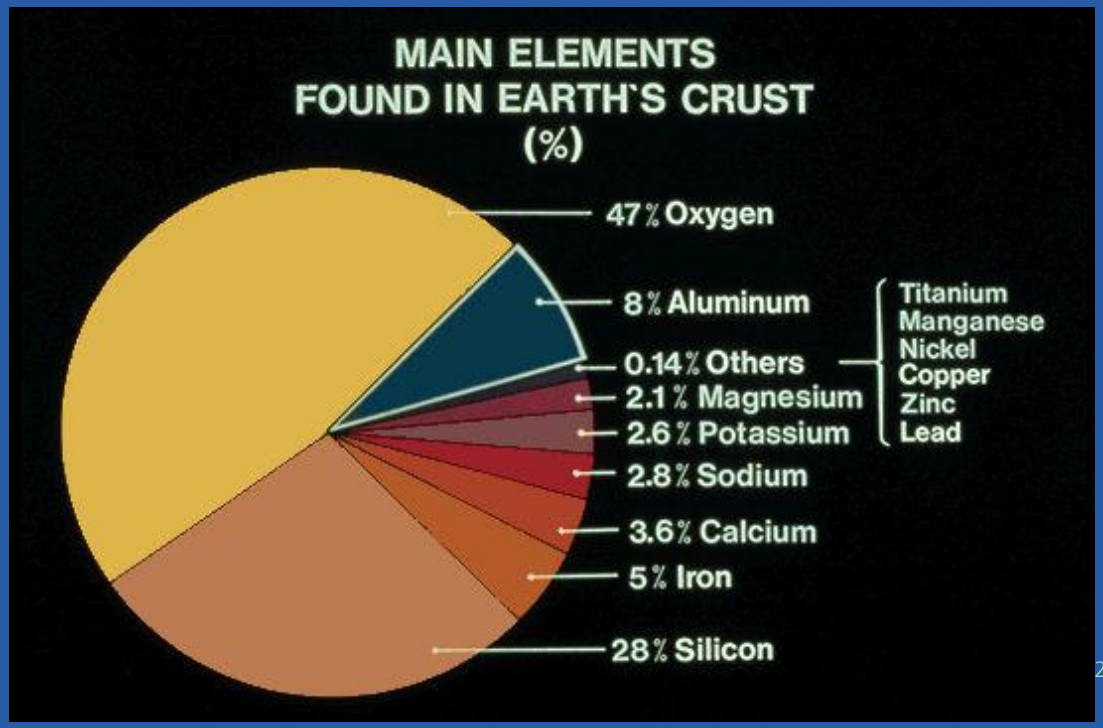
- There are contaminated sites at the Laboratory (LANL)
- Target Action Limit of **0.64 ng/L** (Human Health Criteria); **14 ng/L** (Wildlife Std).
- A nano gram is one billionth of a gram (1/1,000,000,000 gram) or think of it as one drop of ink in a large tanker truck.
- PCB federal and state drinking water standard is **500 ng/L**.
- The following baseline upper tolerance limits are presented in the Baseline PCB report:

  13 ng/L remote watersheds on the Pajarito Plateau; **24 ng/L** northern New Mexico tributaries; **98 ng/L** urban runoff from developed landscape on the Pajarito Plateau.

2012 TAL Exceedances

Aluminum

- Aluminum is the third most common element in the earths crust.
- Naturally occurring background; mineral bound aluminum.
- Aluminum is not soluble at near neutral pH (6 to 8).
- Detections are most likely due to filter breakthrough of colloidal size aluminum bearing minerals.



2012 TAL Exceedances



Copper and Zinc

- Naturally occurring background at some locations, urban run-on, also, some SMAs have contamination

Common Sources of Zinc and Copper in Stormwater Runoff from Urban Landscapes and Industrial Facilities

- Roofs—galvanized HVAC, ducts, ventilation fans, turbines, galvanized downspouts and culverts, chain-link fences and flashing, guard rails, cooling water systems, copper pipes, copper flashing
- Parking areas—automobiles, trucks, forklifts, motor oil, tire particles, hydraulic fluid, truck/trailer or bus parking, vehicle break pads
- Material storage, galvanized metals, chain link fences, printed circuit boards, and vehicles (as above)

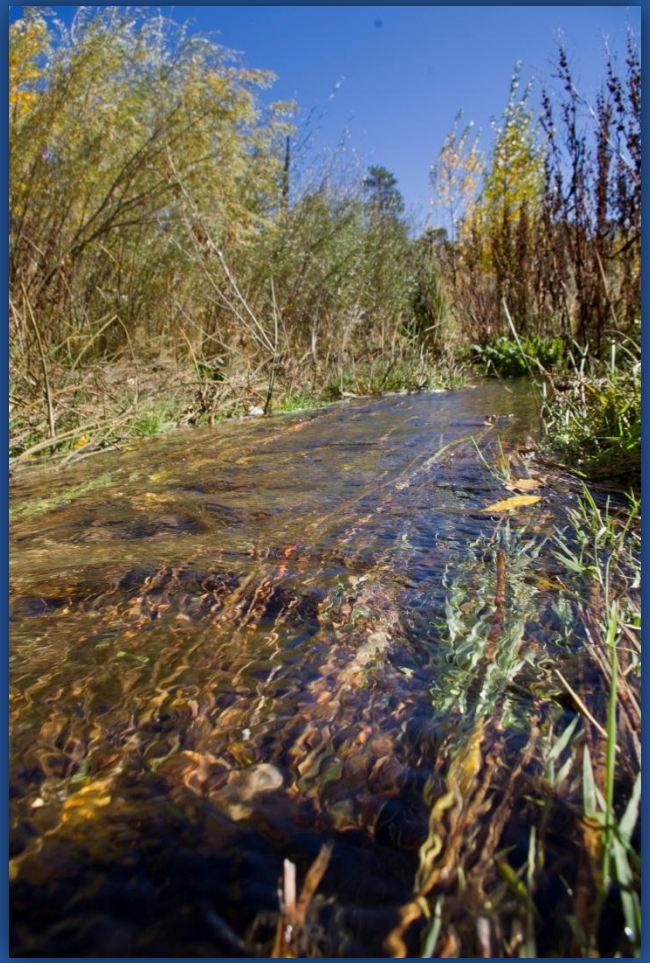



2012 TAL Exceedances

Gross Alpha

- Derived from naturally occurring background uranium and thorium containing minerals and their daughter products radium and radon.
- Some select locations where historical releases have occurred.
- For the most part, minerals that contain potassium, uranium, and thorium are radioactive emitting alpha and gamma radiation
- Granite and volcanic rocks contain trace quantities of uranium, thorium, radium, and radioactive potassium (K^{40}); granite counter tops
- As these rocks weather they are reduced to fine grain sediments that are transported by water and wind
- Water samples containing sediments derived from granites and volcanic rocks will generally yield positive gross alpha and gamma analytical results

- Collected 25 stormwater runoff samples from 23 SMAs
- Less runoff in 2012 due to better controls and reduced precipitation
- Exceedances most often are aluminum, copper, zinc, gross alpha, and PCBs
- Exceedances are most likely within range of background or baseline values
- How do stormwater run-on (non-SWMU sources) pollutants affect IP TAL results?



Enhanced Stormwater Control Measures

Jeff Walterscheid

Why Corrective Action?

- **The Individual Permit states "if confirmation monitoring shows target action levels are not being met at a particular Site, Permittees must take corrective action through installation of measures reasonably expected to:**

I. Meet applicable target action levels at the Site;

II. Achieve total retention of stormwater discharges from the Site;

III. Totally eliminate exposure of pollutants to stormwater;

IV. Demonstration that the Site has achieved RCRA "no further action" status or a Certificate of Completion under NMED's Consent Order."
(Permit No. NM0030759, section E.)

  - Based on monitoring results, Site Monitoring Areas (SMAs) with confirmation samples exceeding Target Action Levels (TALs) are evaluated for the above criteria.

What is an Enhanced Control Measure?

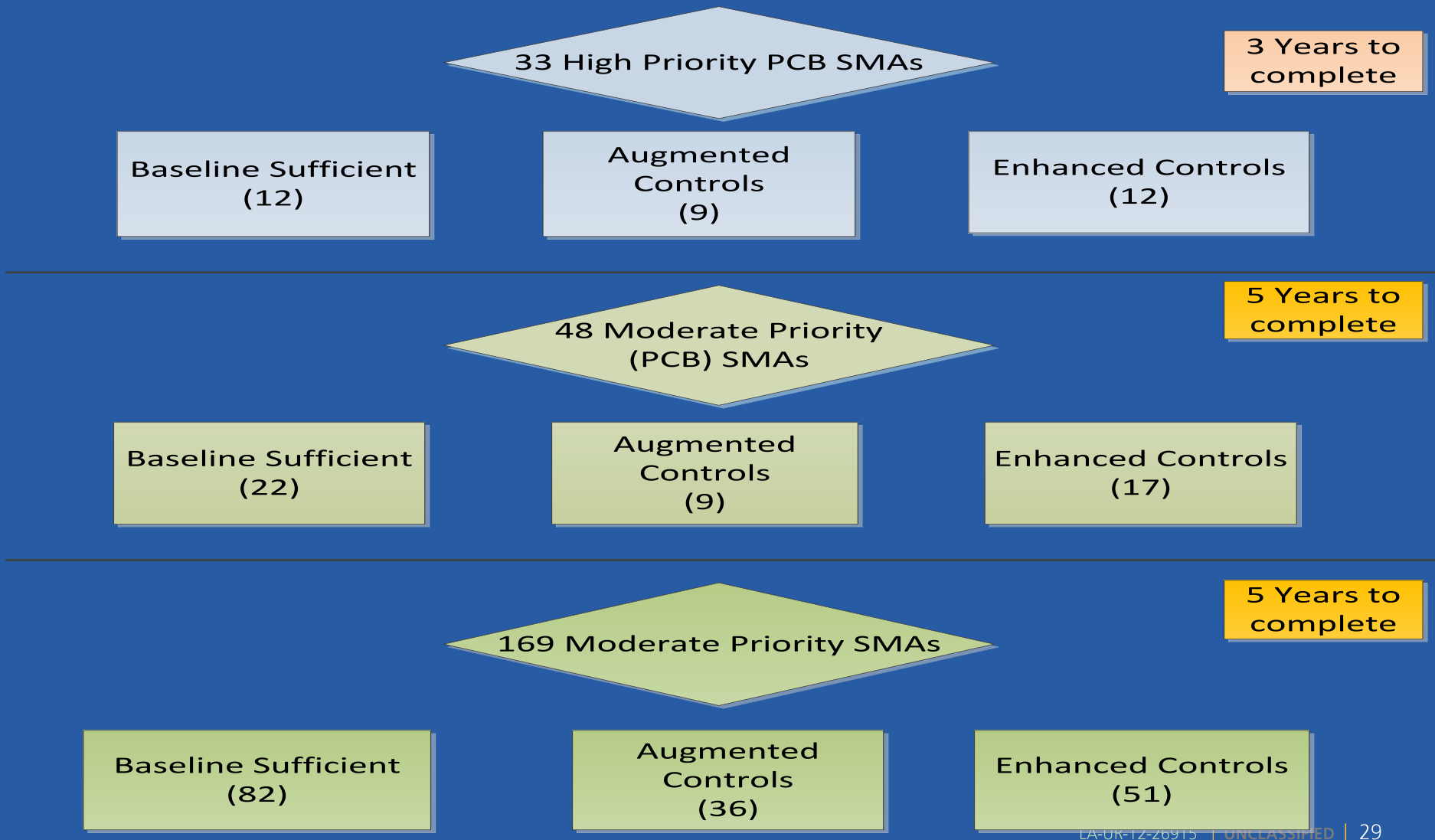
"Corrective action may entail the design and installation of enhanced (additional, expanded, or better tailored control measures) reasonably expected to achieve compliance with target action levels identified in the Permit for all Sites within the SMA drainage area." **(Permit No. NM0030759, section E.1.)**

- Add additional controls
- Modify existing controls
- Replace existing controls

Types of Controls

- **Baseline controls**
  - Limited by Permit requirements that all controls be installed within six months of permit issuance. Controls were installed during the winter months 2010-2011
- **Augmented controls**
  - Review of baseline controls that demonstrates additional or bigger more robust controls are warranted (not required by the Permit)
- **Enhanced controls**
  - Additional, expanded, or better tailored controls following a TAL exceedance using a low-impact development (LID) approach
  - Possible opportunity for remediation of contaminants

SMA Status


33 High Priority PCB SMAs
3 Years to complete
Baseline Sufficient (12)
Augmented Controls (9)
Enhanced Controls (12)
48 Moderate Priority (PCB) SMAs
5 Years to complete
Baseline Sufficient (22)
Augmented Controls (9)
Enhanced Controls (17)
169 Moderate Priority SMAs
5 Years to complete
Baseline Sufficient (82)
Augmented Controls (36)
Enhanced Controls (51)

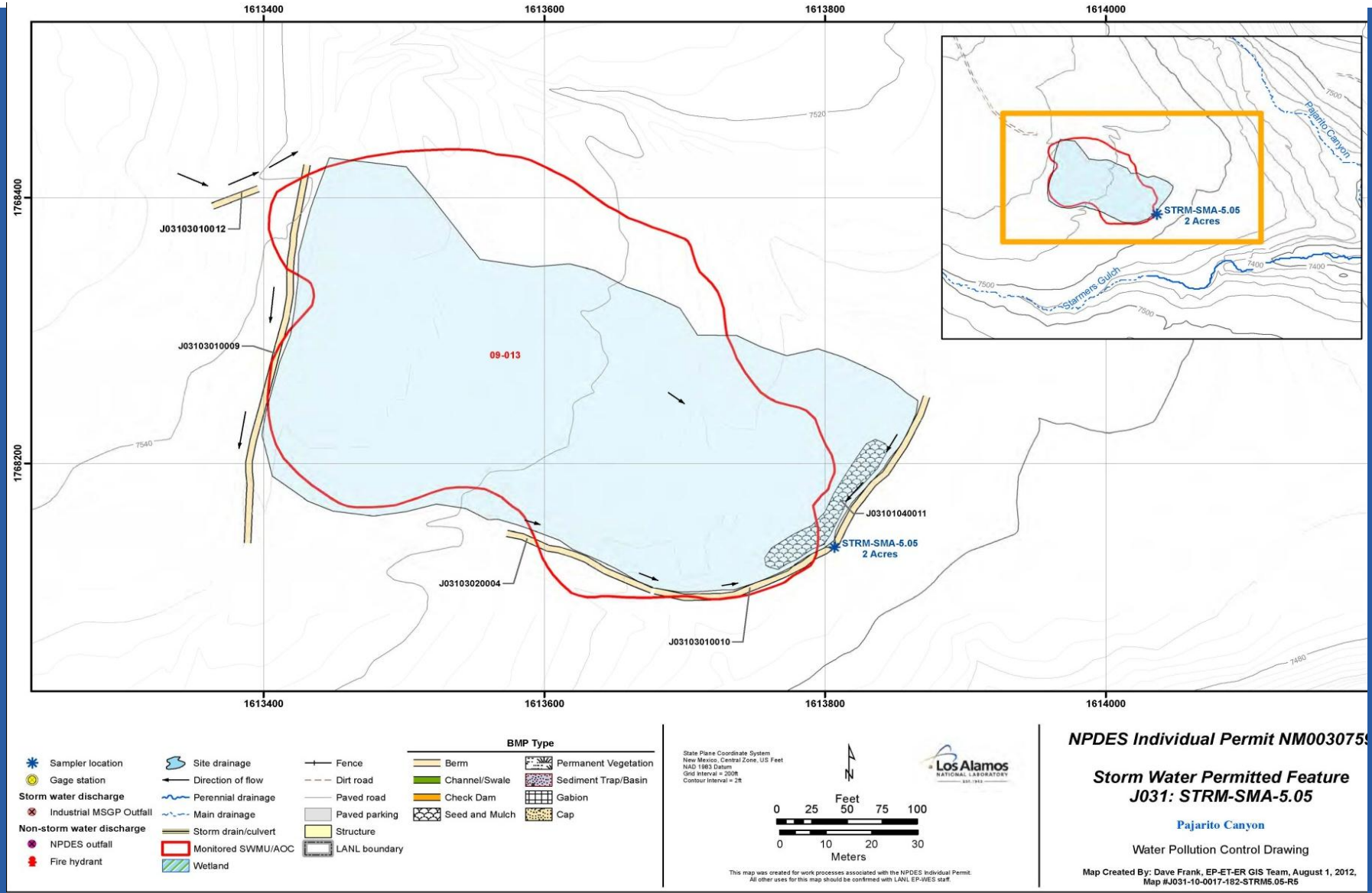
Challenges to Completing Field Work

- **Seasonal restrictions**
  - Weather
  - Threatened and endangered species
- **Health and safety issues**
  - Accessibility (steep slopes, limited access points, etc.)
  - Potential site specific concerns (UXO, HE, utilities. etc.)
  - Operational and historical considerations
- **Cultural protections**
  - Archaeological sites
  - Historical sites/trails
- **Property ownership**
  - Access agreements with Forest Service, LA County, private property owners

Enhanced Controls Installation Tracking

SMA	Asset ID	Classification Name	Run-on Control?	Runoff Control?	Sediment Control?	Erosion Control?
LA-SMA-10.12	L030A03010026	Earthen Berm	X	-	X	-
LA-SMA-10.12	L030A03060028	Straw Wattles	X	-	X	-
LA-SMA-10.12	L030A03060029	Straw Wattles	-	X	X	-
LA-SMA-10.12	L030A02010031	Permanent Vegetation Gr	-	-	-	X
LA-SMA-10.12	L030A03120030	Rock Berm	-	X	X	-
LA-SMA-10.12	L030A03010027	Earthen Berm	-	X	X	-
# Controls installed	6					
STRM-SMA-5.05	J03103010009	Earthen Berm	X	-	X	-
STRM-SMA-5.05	J03103010010	Earthen Berm	-	X	X	-
STRM-SMA-5.05	J03101040011	Seeding	-	-	-	X
# Controls installed	3					

STRM-SMA-5.05


1613400
1613600
1613800
1614000
1768400
1768200
J03103010012
J03103010009
09-013
J03103020004
J03103010010
J03101040011
STRM-SMA-5.05
2 Acres
Pajarito Canyon
Starmers Gulch
7520
7540
7500
7400
Sampler location
Gage station
Storm water discharge
Industrial MSGP Outfall
Non-storm water discharge
NPDES outfall
Fire hydrant
Site drainage
Direction of flow
Perennial drainage
Main drainage
Storm drain/culvert
Monitored SWMU/AOC
Wetland
Fence
Dirt road
Paved road
Paved parking
Structure
LANL boundary
BMP Type
Berm
Channel/Swale
Check Dam
Seed and Mulch
Permanent Vegetation
Sediment Trap/Basin
Gabion
Cap
State Plane Coordinate System
New Mexico, Central Zone, US Feet
NAD 1983 Datum
Grid Interval = 200ft
Contour Interval = 2ft
Feet
0 25 50 75 100
0 10 20 30
Meters
This map was created for work processes associated with the NPDES Individual Permit.
All other uses for this map should be confirmed with LANL EP-WES staff.
Los Alamos
NATIONAL LABORATORY
NPDES Individual Permit NM0030759
Storm Water Permitted Feature
J031: STRM-SMA-5.05
Pajarito Canyon
Water Pollution Control Drawing
Map Created By: Dave Frank, EP-ET-ER GIS Team, August 1, 2012,
Map #J031-10-0017-182-STRM5.05-R5

Enhanced Controls Installed At STRM-SMA-5.05

SMA	Asset ID	Classification Name	Run-on Control	Runoff Control	Sediment Control	Erosion Control
STRM-SMA-5.05	J03103010009	Earthen Berm	X	-	X	-
STRM-SMA-5.05	J03103010010	Earthen Berm	-	X	X	-
STRM-SMA-5.05	J03101040011	Seeding	-	-	-	X
# Controls installed	3					

Run–on Control Berm

Run-off Control Berm

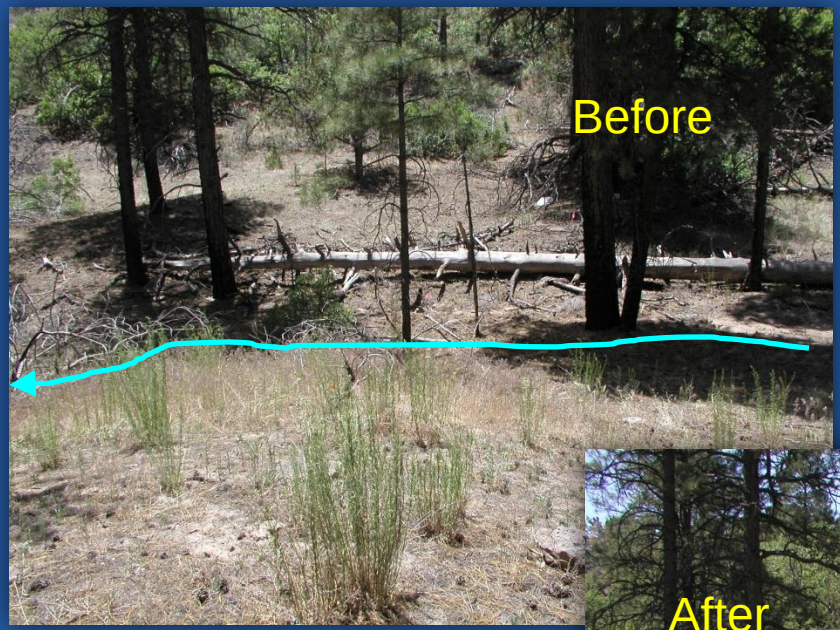
Enhanced Controls

LA-SMA-0.85

- Run-off
- Control berm
- Spillway

Enhanced Controls

CDB-SMA-1



- Run-off
- Control berm
- Spillway

Enhanced Controls

M-SMA-1

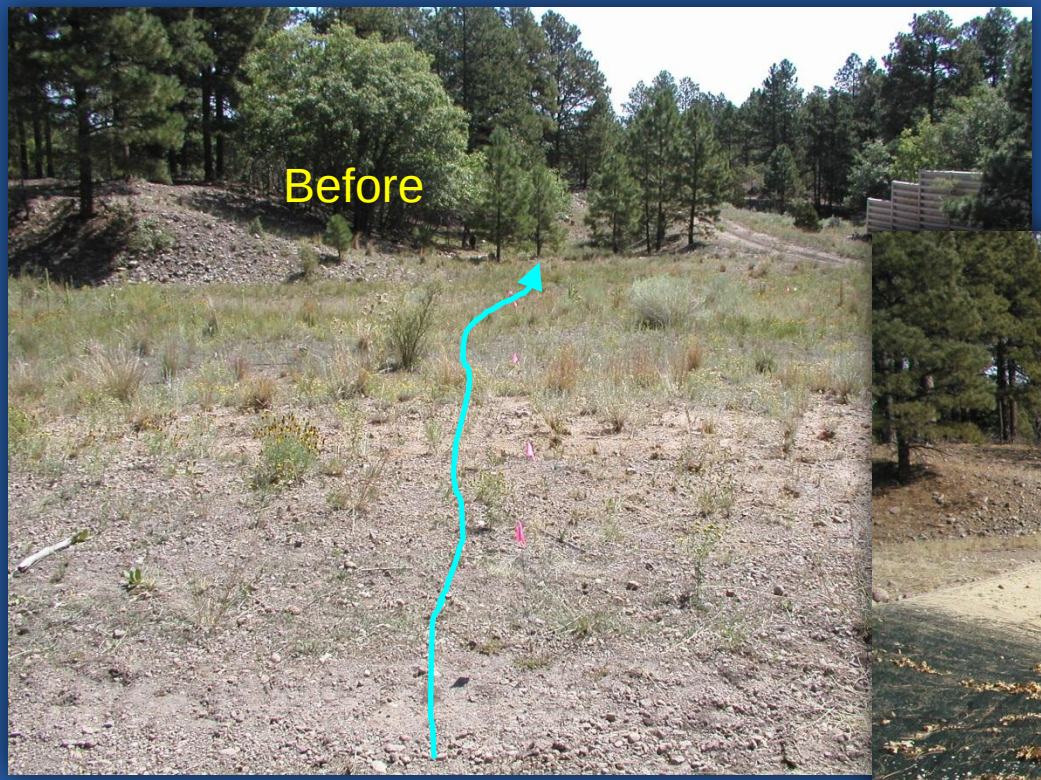
- Erosion control
- Low head weir

Enhanced Controls

CDV-SMA-1.4

- Run-on
- Sediment control berm

Enhanced Controls



CDV-SMA-1.4

- Retention

Enhanced Controls

W-SMA-1.5

- Run-off
- Control berm
- Spillway
- Rock check dam

Enhanced Controls

W-SMA-10

- Multiple channels
- Run-off
- Control berms
- Spillways

Enhanced Controls

W-SMA-11.7

- Sheet flow
- Run-off
- Rock check dams
- Control berms

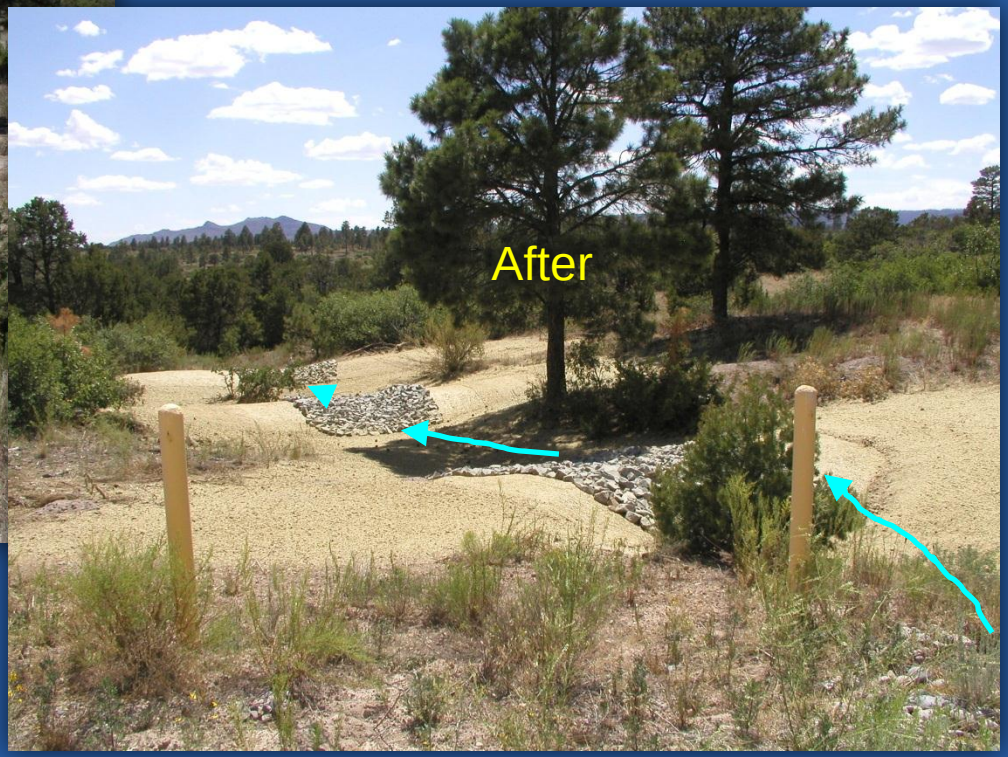
Enhanced Controls

W-SMA-11.7

- Sheet flow
- Control berm with mulch

Enhanced Controls

W-SMA-14.1



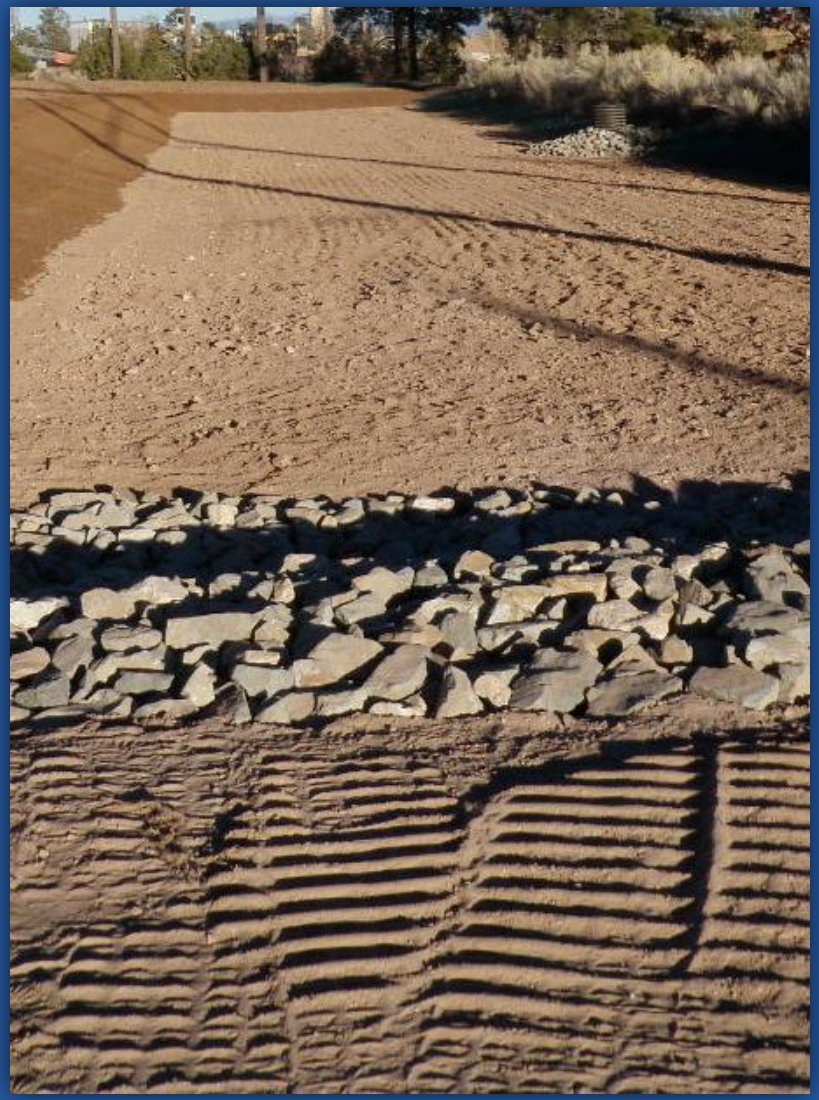
- Run-off
- Control berms
- Spillways

Enhanced Controls

PT-SMA-0.5

- Run-on & Run-off
- Control berms

Enhanced Control at S-SMA-1.1 – Total Retention



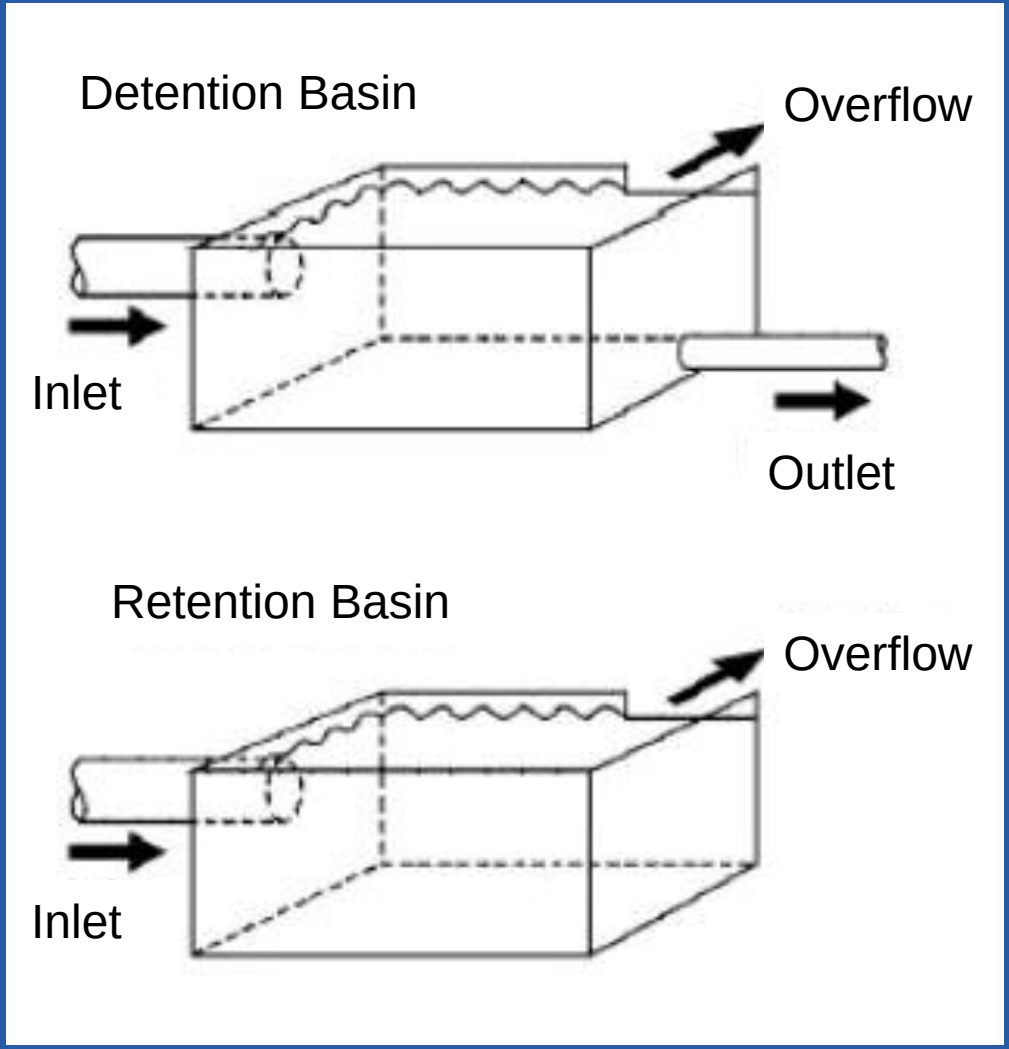
Design Storm for "Total Retention"

Bill Foley

Total Retention – Background

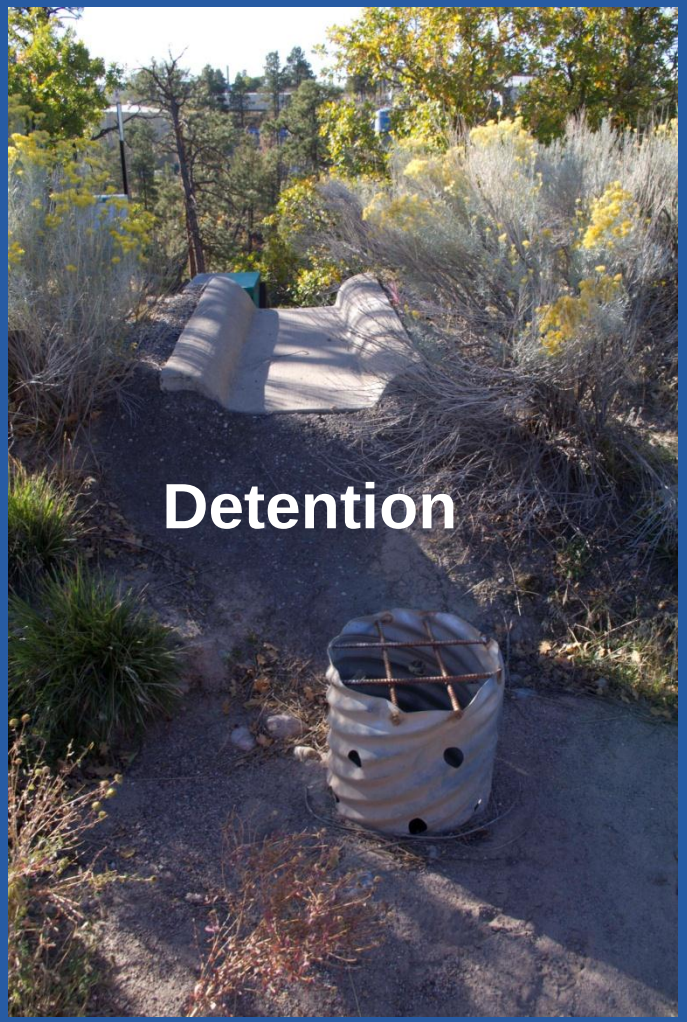
- **The Individual Permit (IP)**
  - Regulates stormwater discharges from “Sites” (i.e., SWMUs and AOCs)
  - Monitored at Site Monitoring Area (SMA) scale (i.e. drainage basins)
- **IP requires “corrective action” when a stormwater sample exceeds a target action level for one or more constituents.**
- **One method of corrective action is “total retention.”**
- **The IP does not specify a design storm for total retention**

Differences between detention and retention



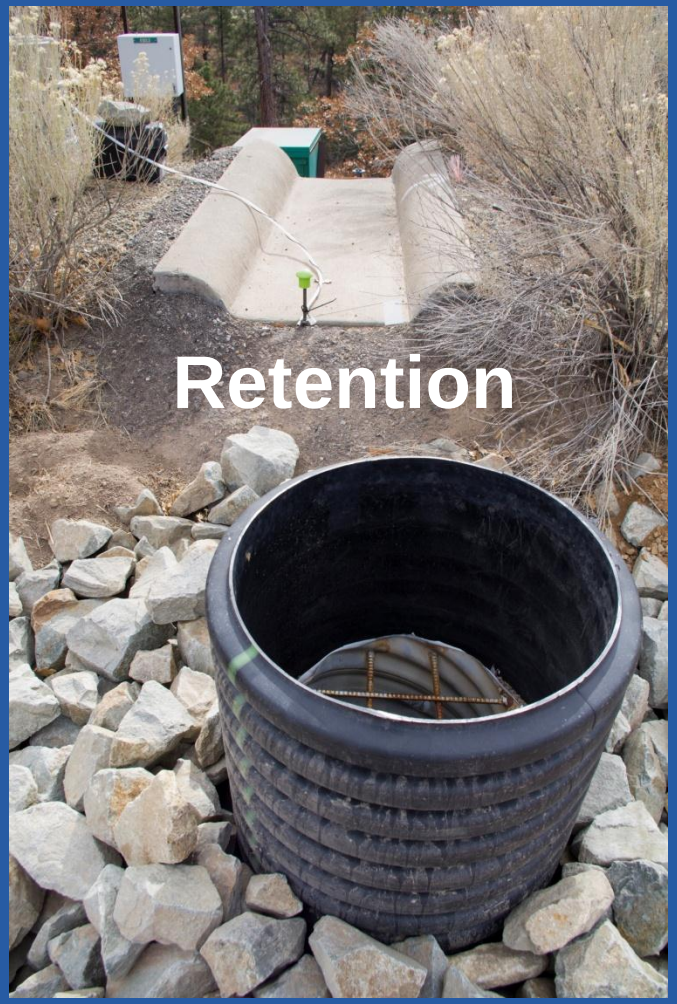
Is your objective to detain stormwater?

- **Reduce peak flows**
- **Reduce impacts of downstream flooding and erosion**



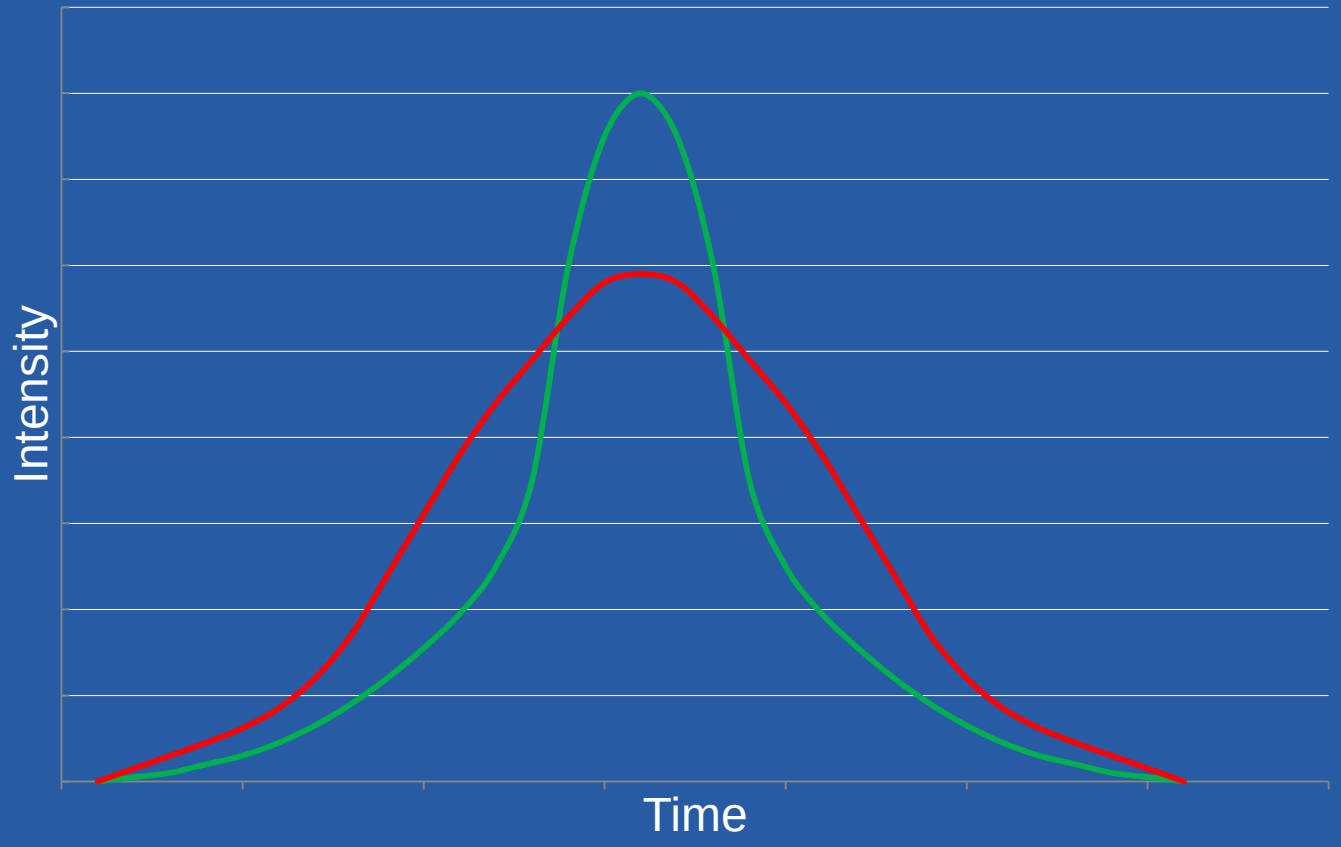
Is your objective to retain stormwater?

- **Stormwater leaves via infiltration, evaporation, or transpiration**
- **Provides similar benefits as detention**
- **Provides additional water quality treatment for same volume**



What Is a “Design Storm?”

- **Storm characteristics**
  - Frequency
  - Intensity
  - Duration



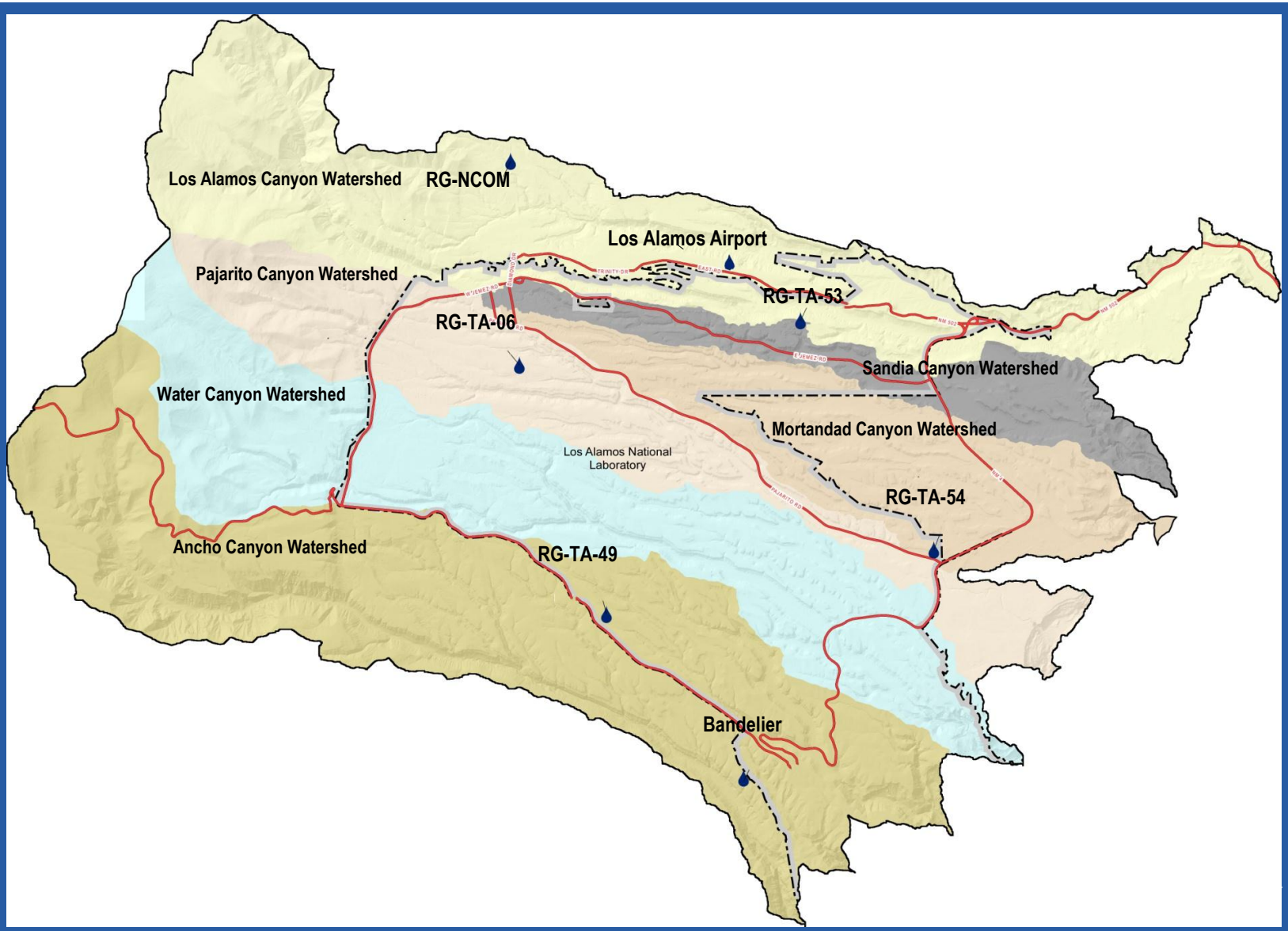
What is a “Design Storm?”

- **Storm events defined in two ways**
  - Return period
    - e.g. 5 year - 1 day
  - Percentile rainfall event
    - e.g. 80th percentile = 80 out of 100 are smaller
- **Applicable regulation and guidance**

Issues To Consider When Choosing a Design Storm

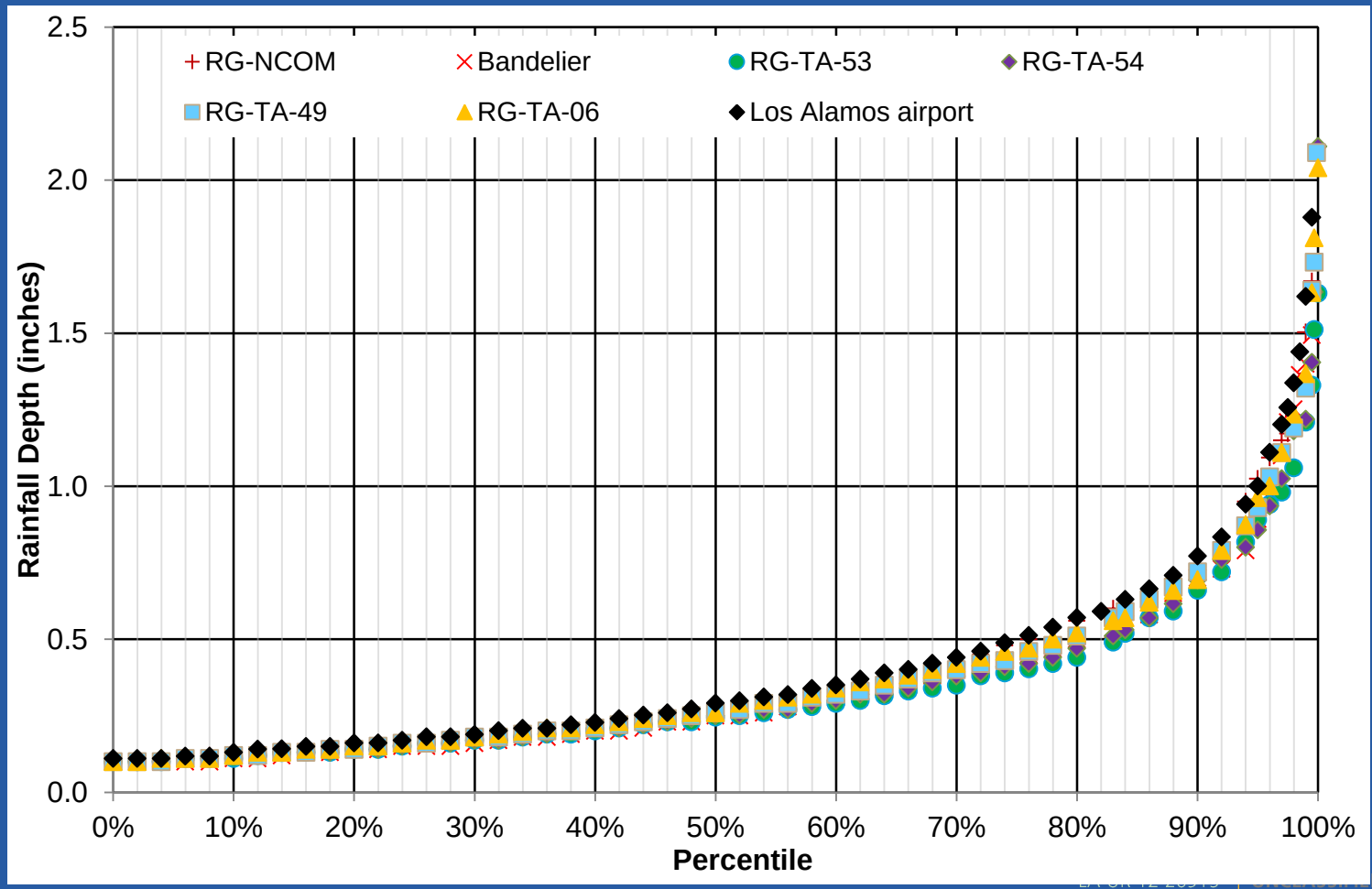
- **Storm events**
  1. Independent of each other, local variations
  2. Pre-existing / antecedent conditions
  3. Soil conditions, time between storms, etc.

Gage Station Location

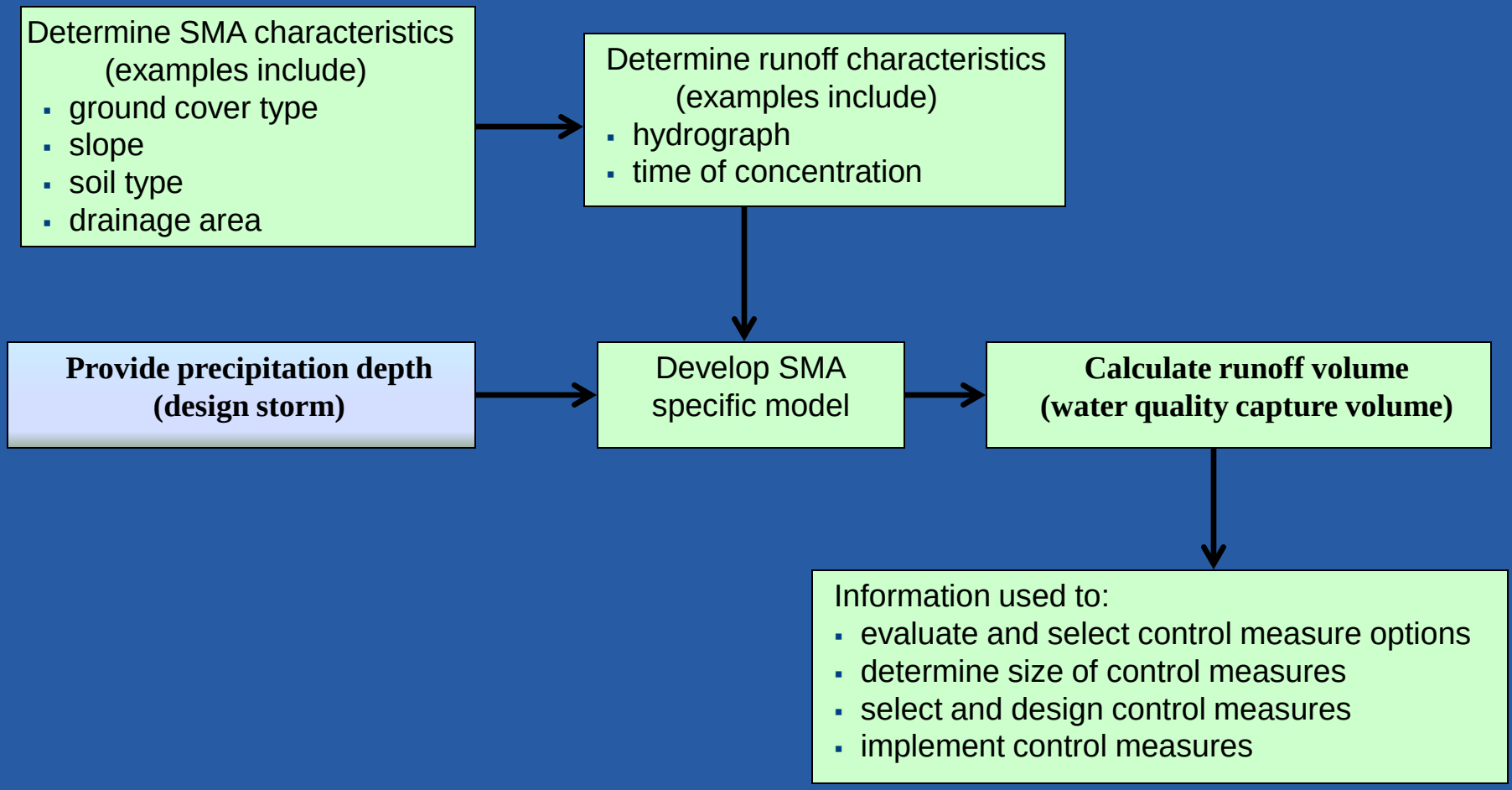


Selecting a Design Storm for the IP

Gage Data Rainfall Distribution

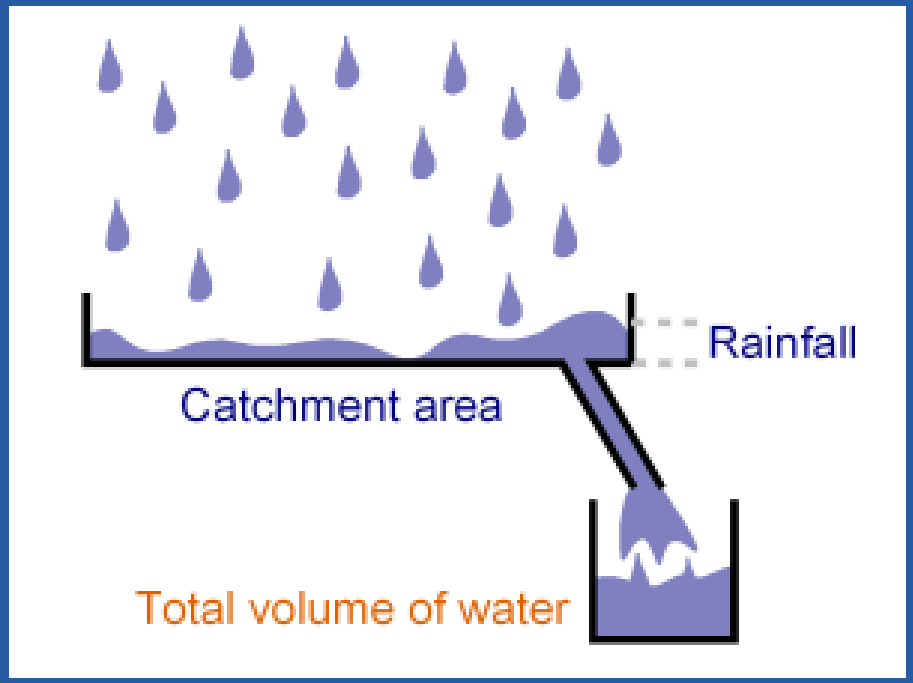


How Do You Use the Design Storm?

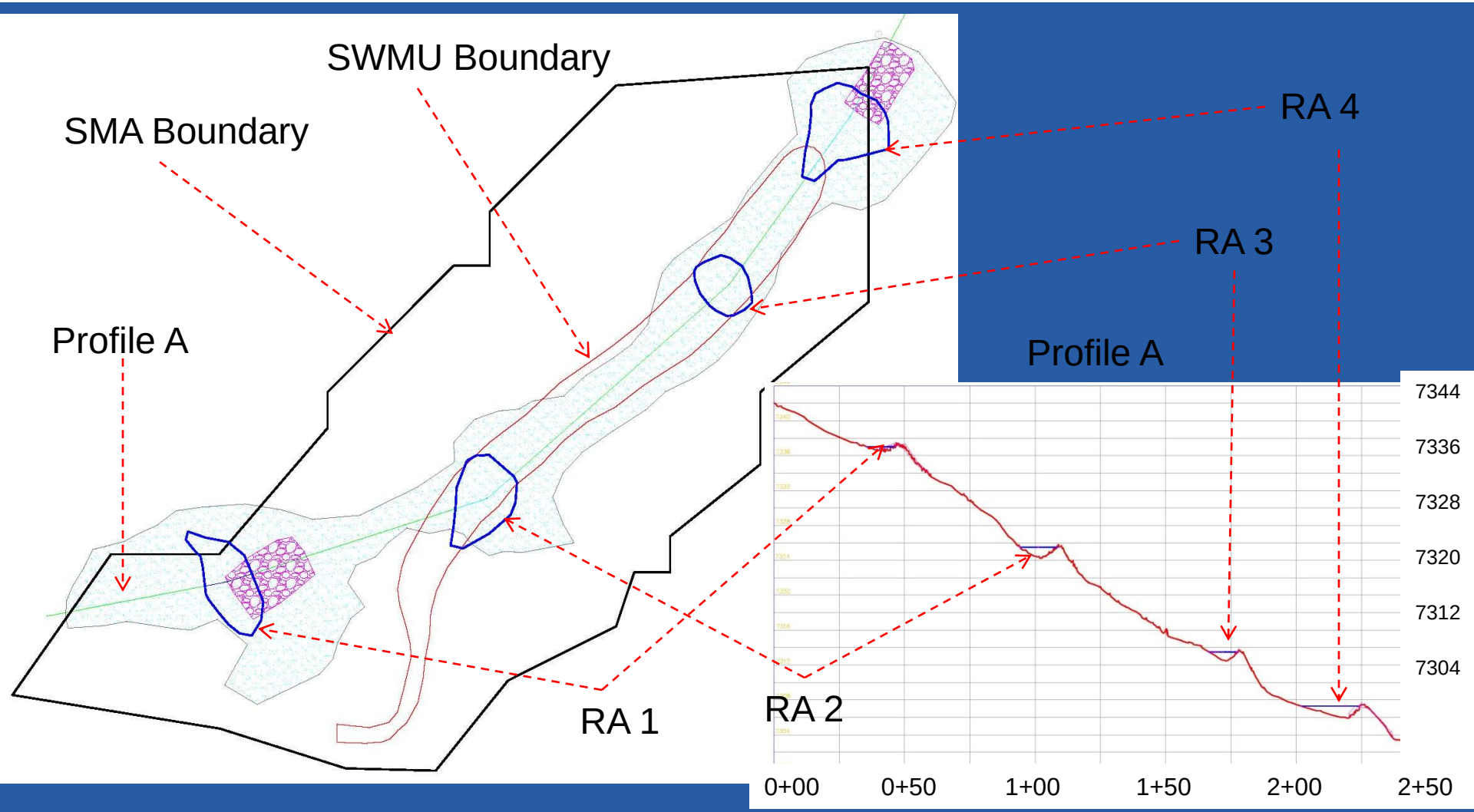


Issues To Consider When Selecting Design Alternatives

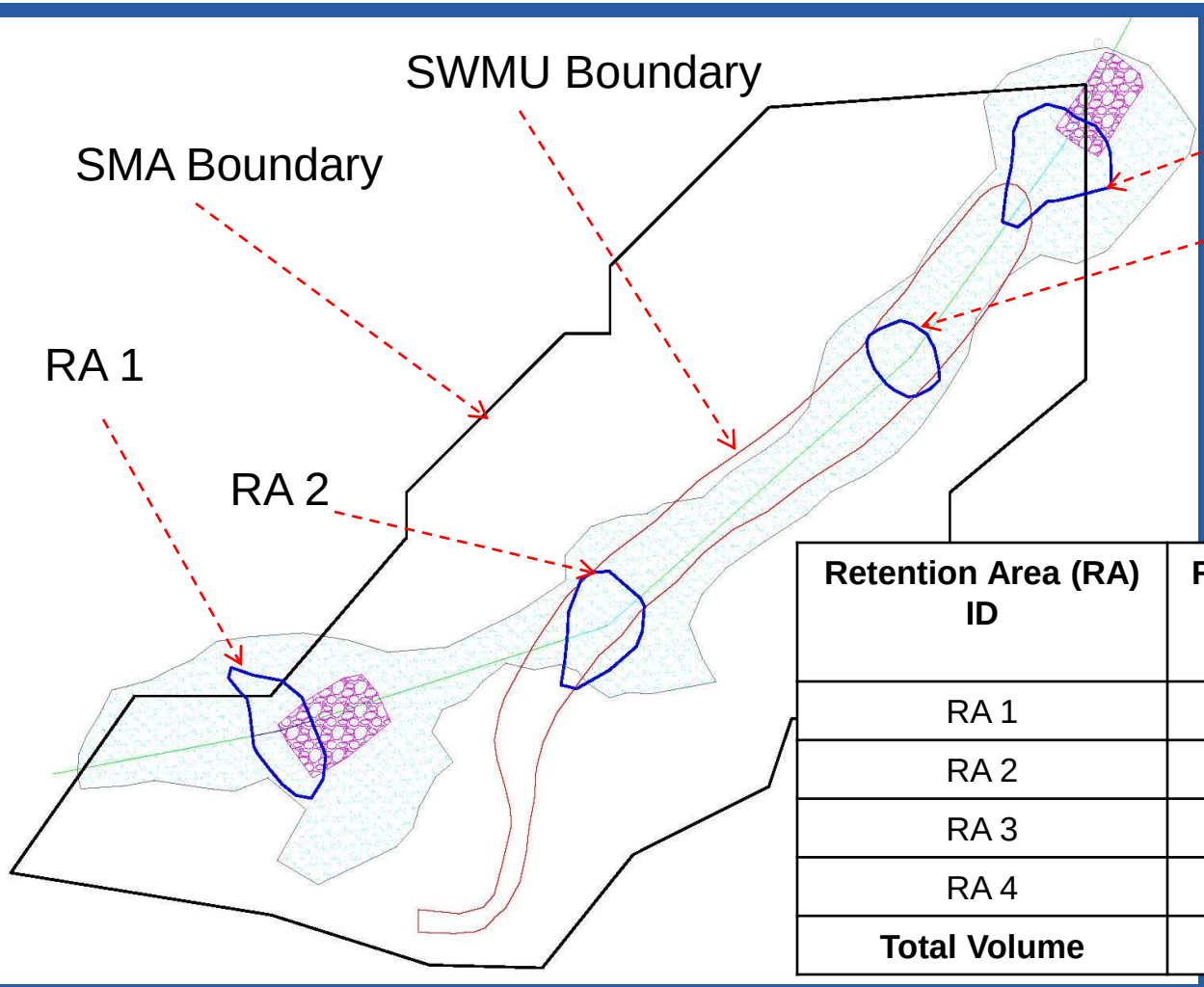
- **SMA variations**
  - Area, development condition, physical characterization, etc.
- **Site relation to SMA**
  - Relative size and location within SMA, etc.



Design Storm Used for Total Retention Evaluation Example



Design Storm Used for Total Retention Evaluation Example



Retention Area (RA) ID	Retention Volume (cubic yards)	Design Storm Runoff Volume (cubic yards)
RA 1	1.6	
RA 2	3.5	
RA 3	2.0	
RA 4	5.8	
Total Volume	**12.9**	**9.4**

Summary

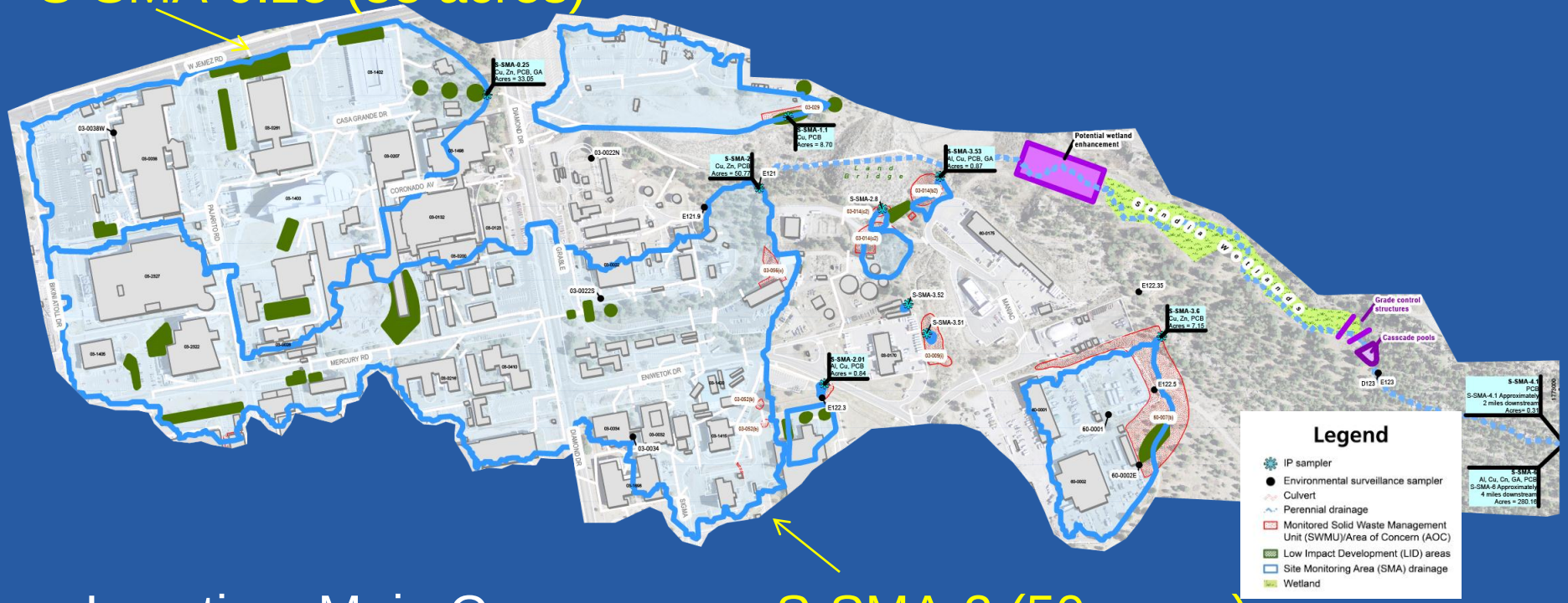
- **The 95th percentile design storm (1.0 in.) for total retention is**
  - Consistent with U.S. Environmental Protection Agency guidance,
  - Based on decades of local precipitation data, and
  - Conservative
- **The Laboratory proposes to use the 95th percentile design storm as the metric for meeting total retention under Section E.2.(b) of the IP**
- **This approach has been proposed to EPA and WELC**

Integrated Stormwater Approach in Upper Sandia Canyon

Deborah Apodaca Pesiri


Water Canyon
Cañon de Valle
Three Mile Canyon
Two Mile Canyon
Pajarito Canyon
Mortandad Canyon
Ten Site Canyon
Sandia Canyon
Los Alamos Canyon
DP Canyon
Pueblo Canyon
Rendija Canyon
Bayo Canyon
Cañon del Buey

Upper Sandia Map



- Location: Main Campus
- Highly developed area
- Buildings, pavement, roads
- Stormwater: urban runoff

Sandia High Priority SMA's in Corrective Action

- **S-SMA-0.25: LID Bioretention basins and ponds, zuni bowl and Sedimentation Ponds**
- **S-SMA-1.1: LID (Total Retention, inlet and outlet protection, bio-swale**
- **and Run-on Conveyance)**
- **S-SMA-2.0: LID (SWMMM model and LID in progress)**
- **S-SMA-2.01: LID retention**
- **S-SMA-3.53: LID Disconnect impervious areas/run-on diversion (Plug and cap Outfall, Re-route SW through open swale)**
- **S-3.6: Enhanced done (berms and ditch blocks); Design-Re-route Pipes and inlets through SWMU**
- **S-6.0: Design complete, Phase 1: Sedimentation Ponds; Phase 2-Total Retention and No Exposure**
- **S-4.1: Enhanced done-No exposure for part of SWMU, Run-on diversion**
- **Sandia Wetlands**
  - Grade control Structure Design 100% complete
  - Road constructed this fall
  - Construction take place in Spring

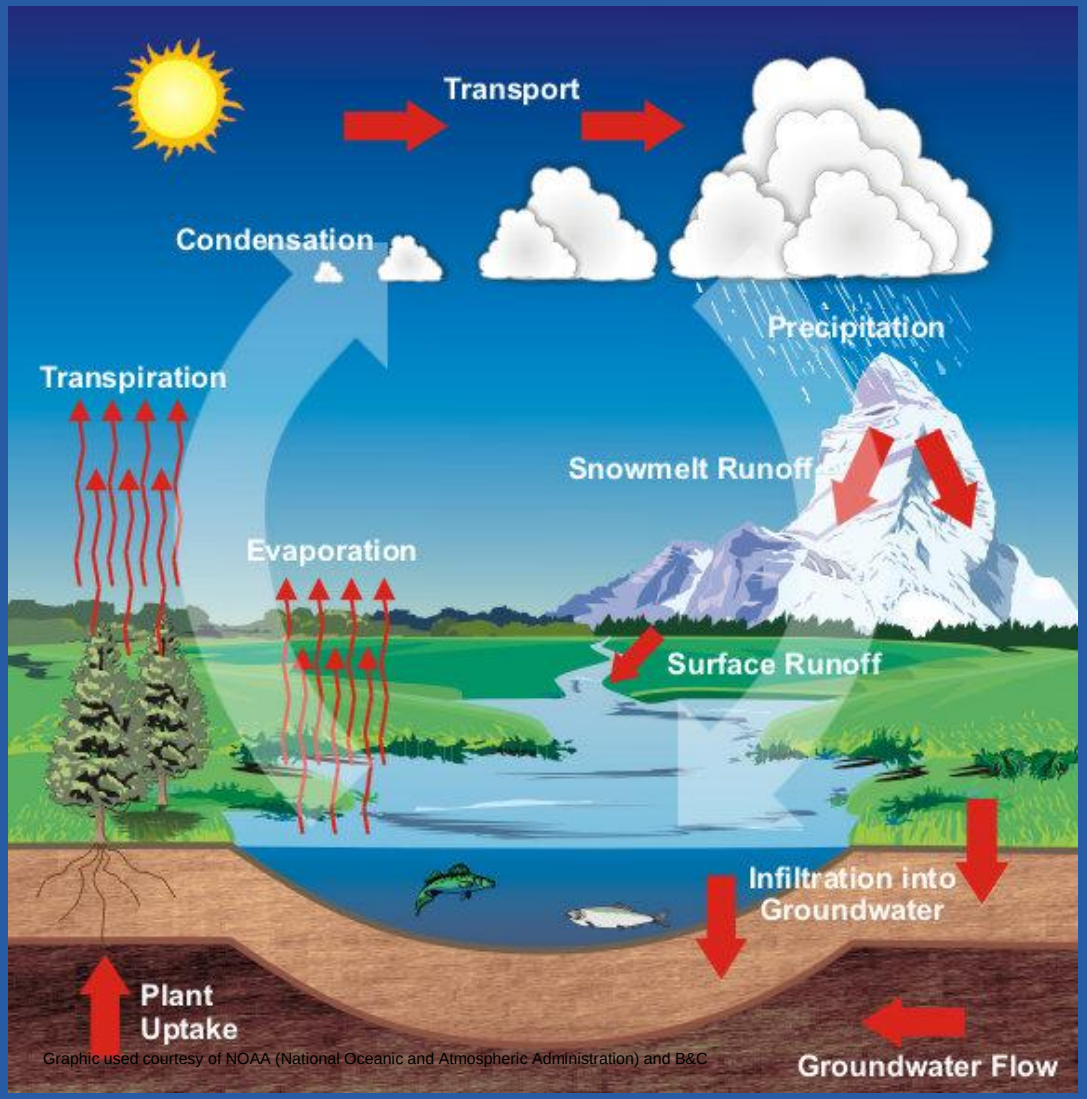
Approach in Upper Sandia at LANL

- **Improve water quality**
- **Reduce peak flows**
- **Reduce contaminant levels**
- **Capture, infiltrate, treat and slowly discharge stormwater**

Strategy: Integrated Stormwater System

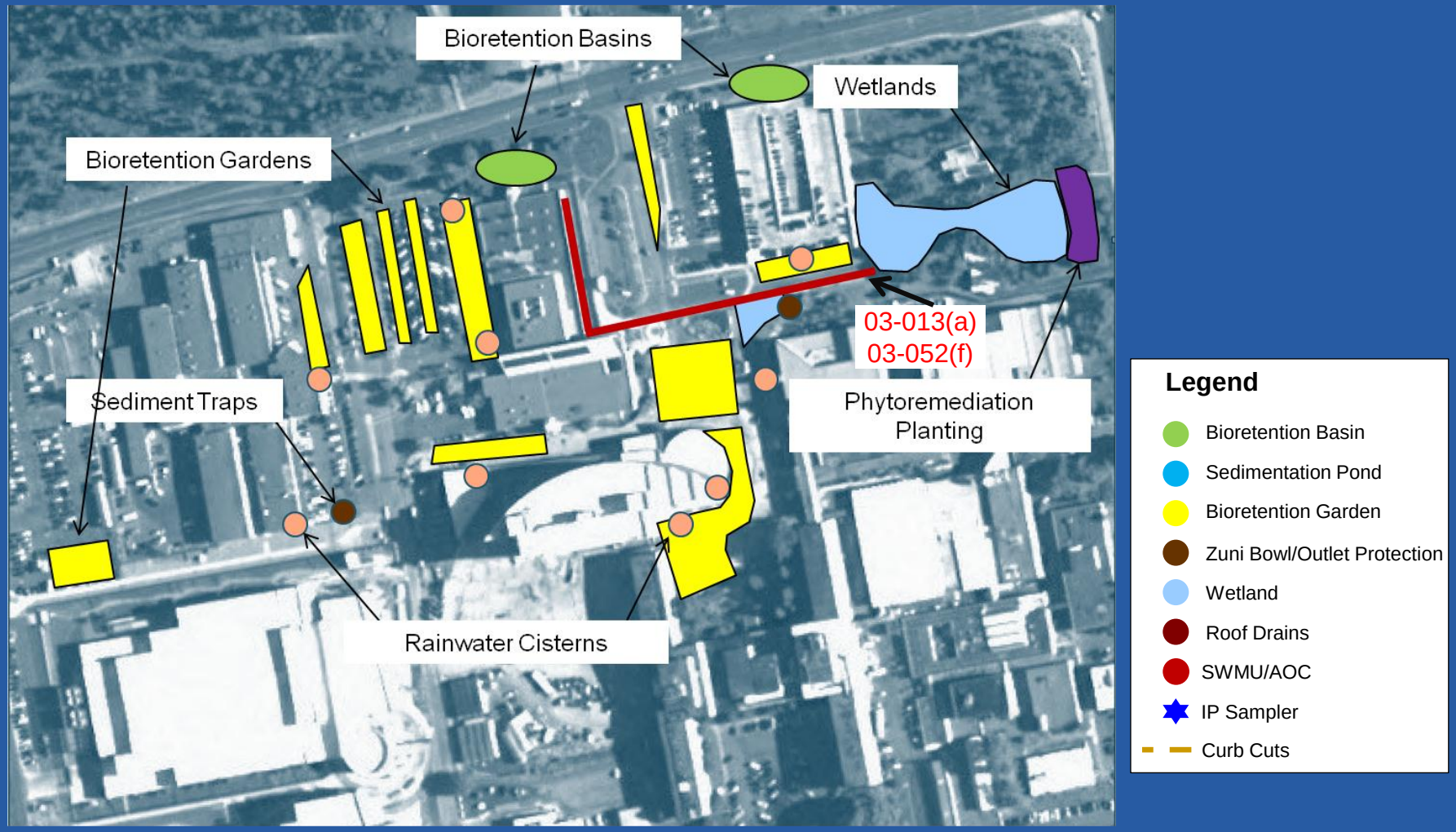
- Upper areas-Low Impact Development (LID)
- Middle- LID and typical stormwater controls
- Anchor Point – Maintain Wetlands

LID Concept: to restore pre-development hydrology and reduce pollutant loads



- Minimize clearing – save trees/vegetation
- Minimize soil compaction of pervious areas
- Minimize impervious area
- Infiltrate or reuse water
- Reduce runoff volume

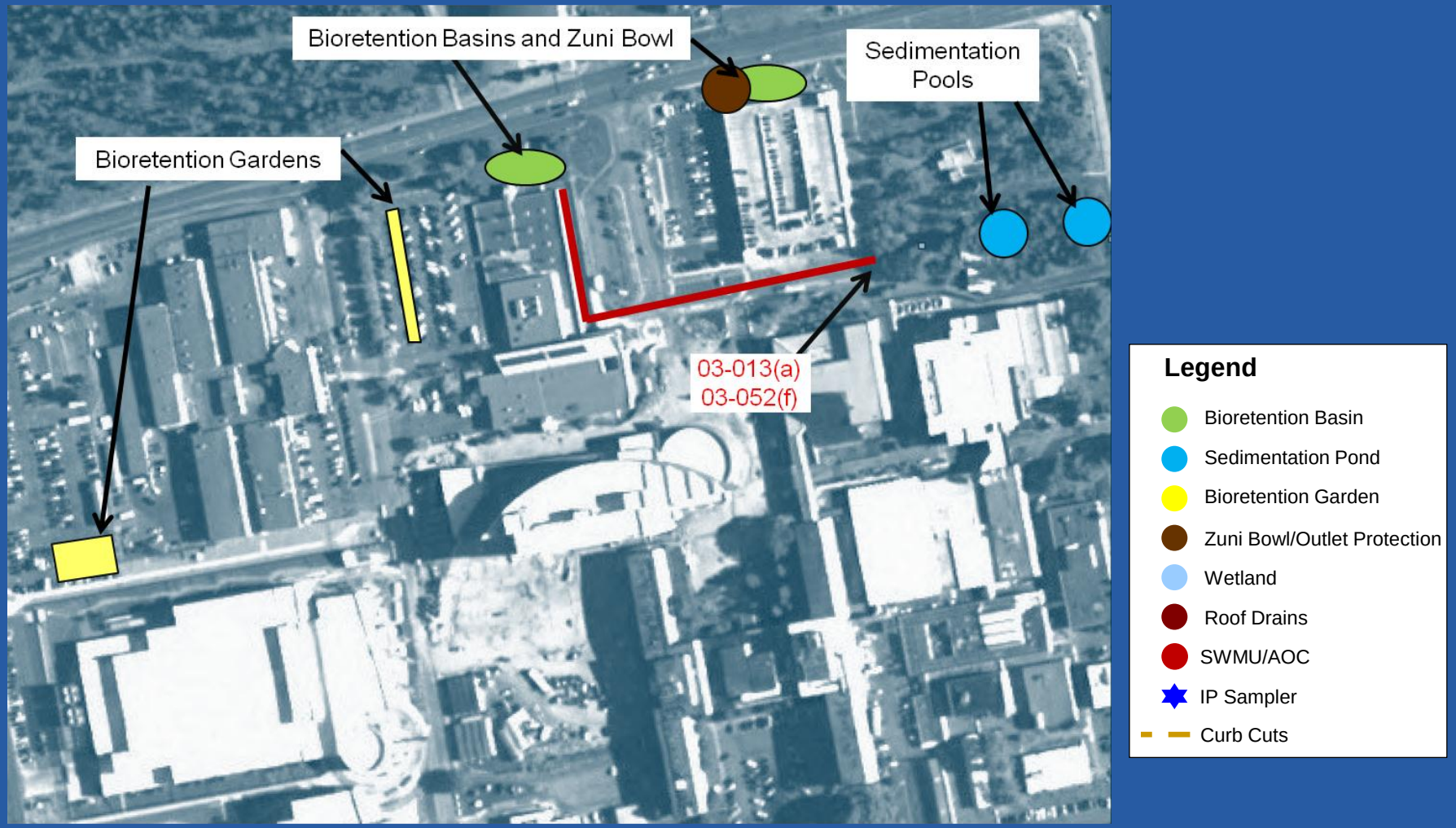
S-SMA-0.25: WELC/Biohabitats LID Alternatives



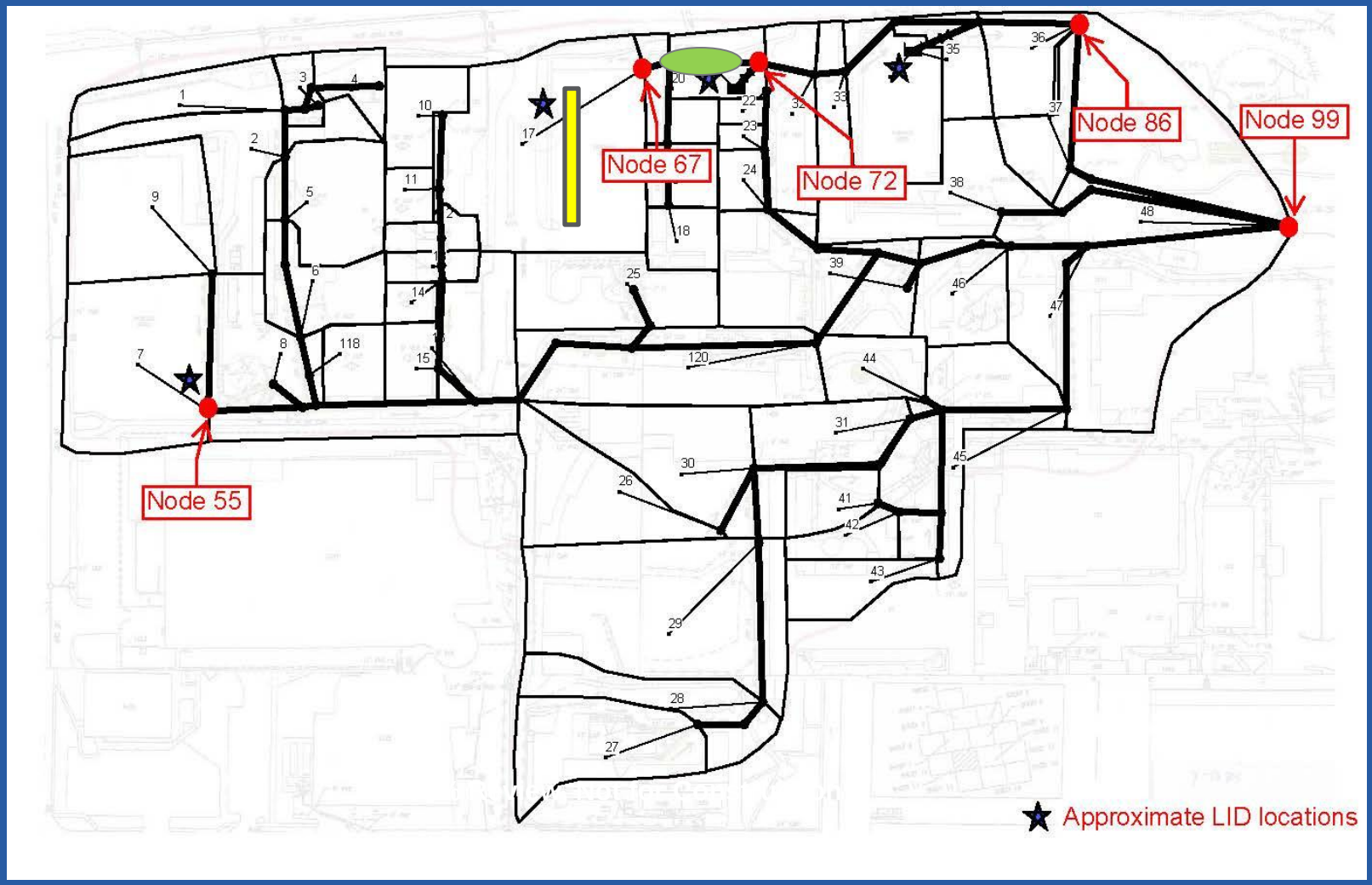
S-SMA-0.25 : IP Work History

- **LANL Conceptual Design and Alternatives Analysis**
  - 03-052(f): trapezoidal concrete channel or extend outfalls
  - 03-013(a): slip line pipe
- **WELC Technical Group (Biohabitats)**
- **LANL cost analysis, utilities research, FOD discussions, hydraulic modeling**
- **90% Design**

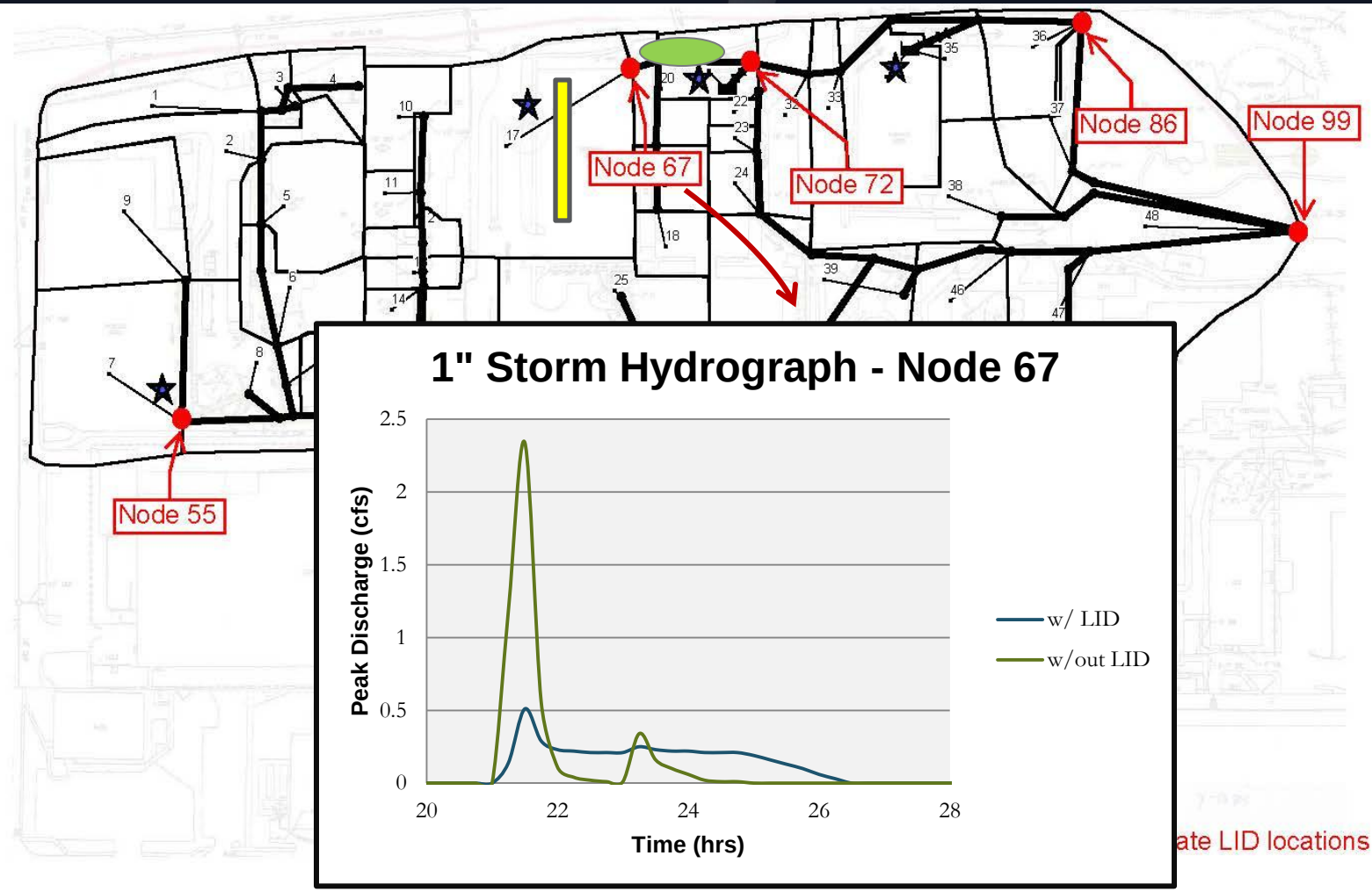
S-SMA-0.25: LANL LID areas in Design



S-SMA-0.25: EPA Stormwater Management Model

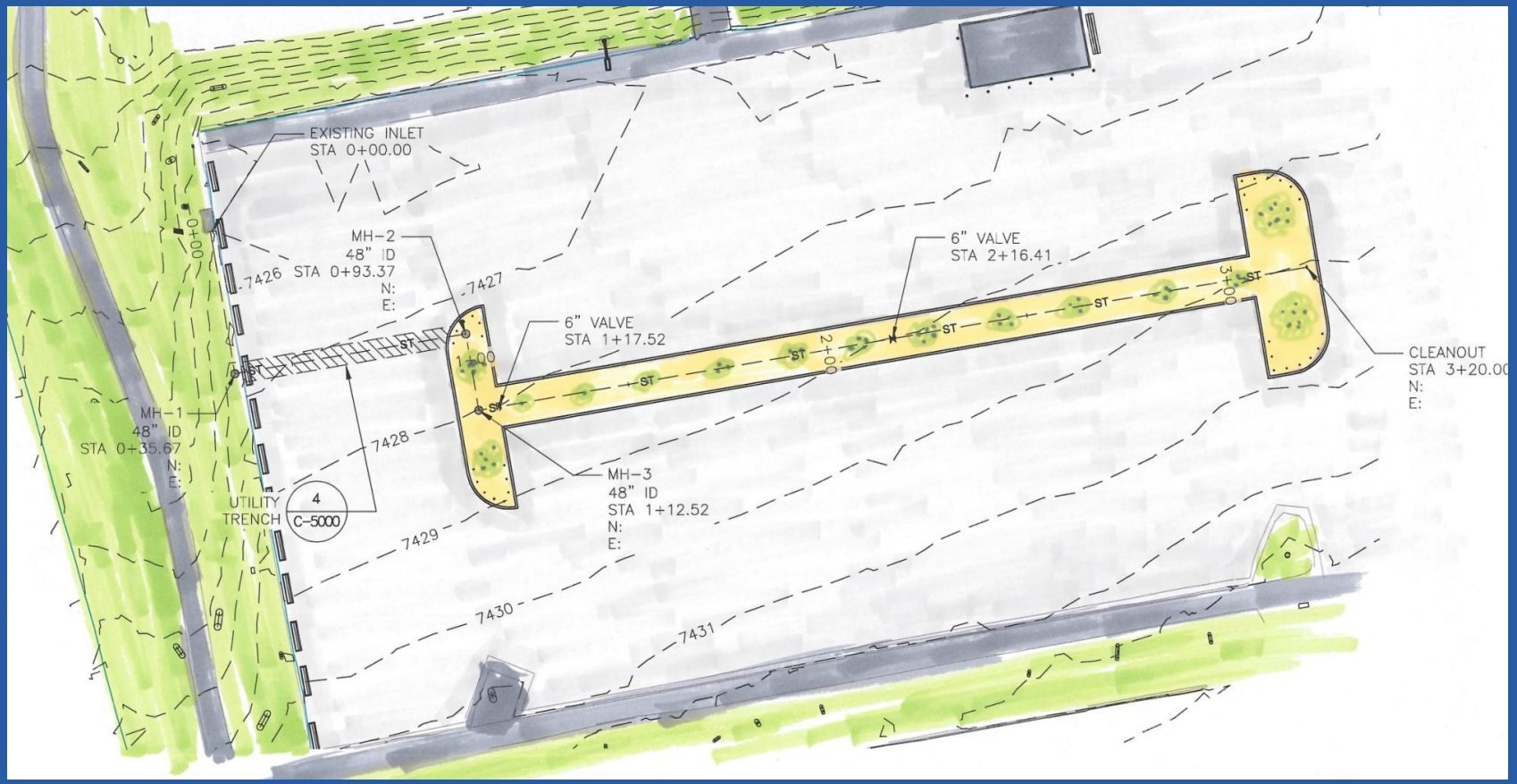


S-SMA-0.25 SWMM Results



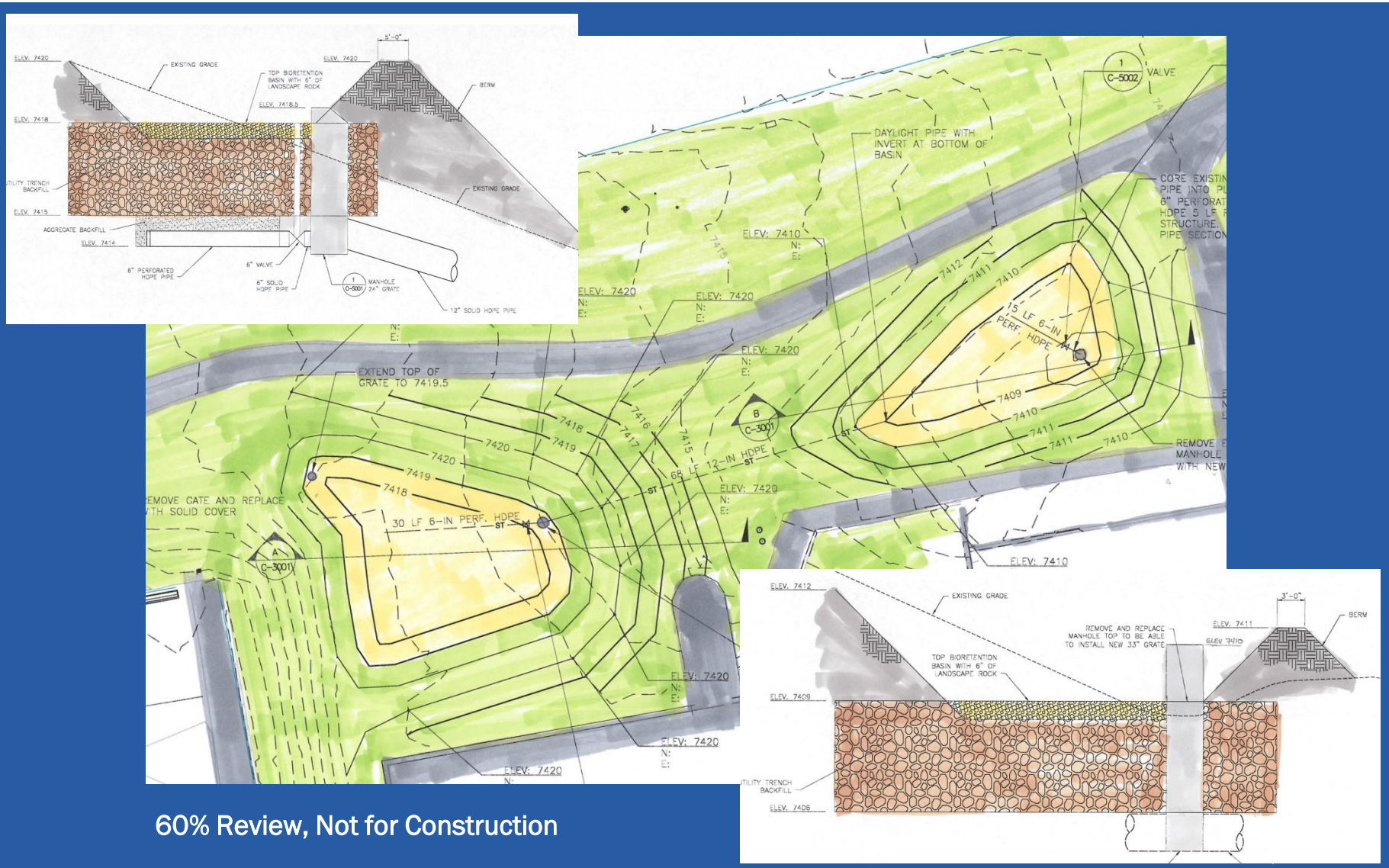
60% Review, Not for Construction

LID at S-SMA-0.25 (Node 67:2.5X Peak Reduction)



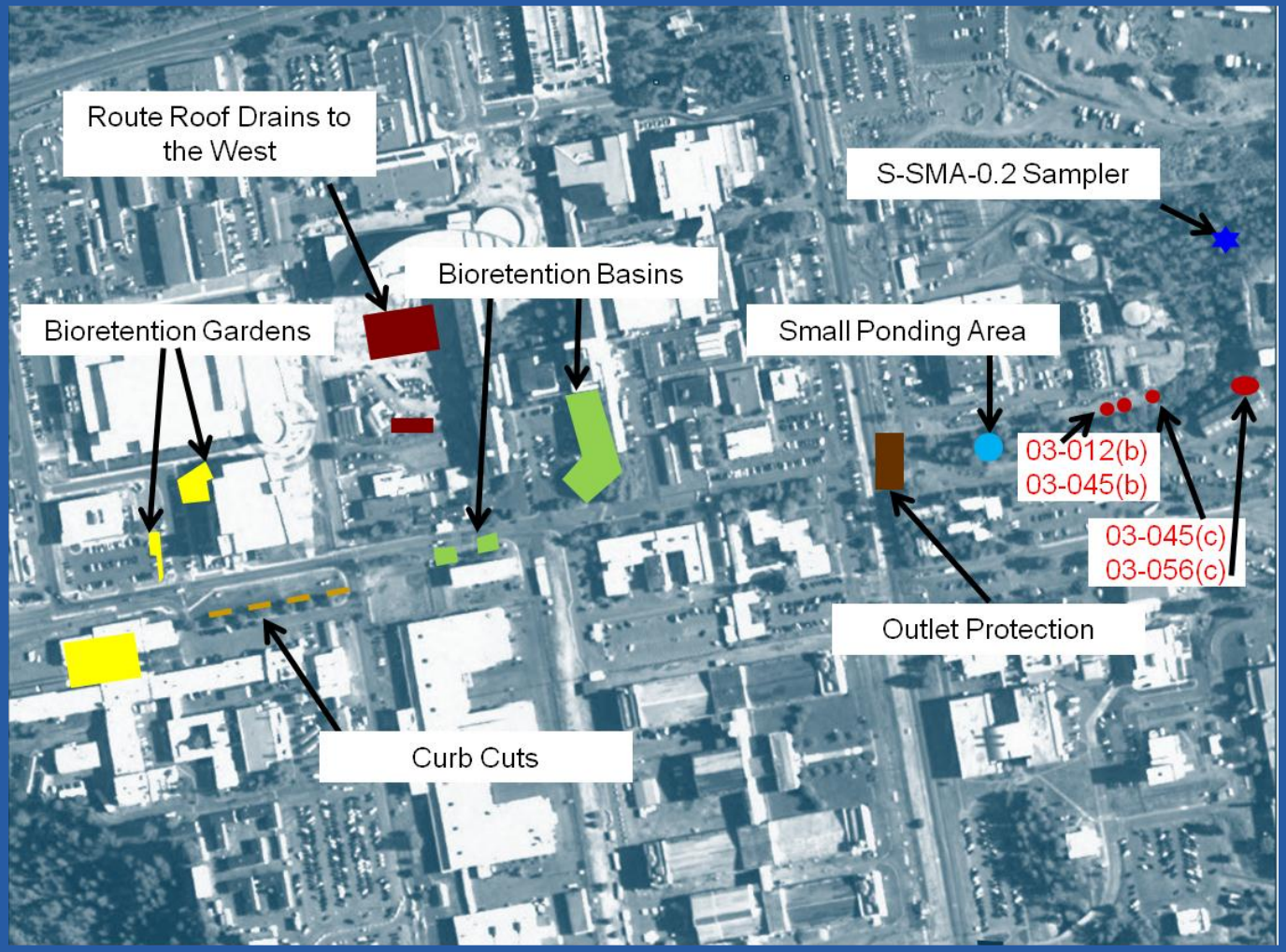
60% Review, Not for Construction

LID at S-SMA-0.25 Node 67: 2X Peak Reduction

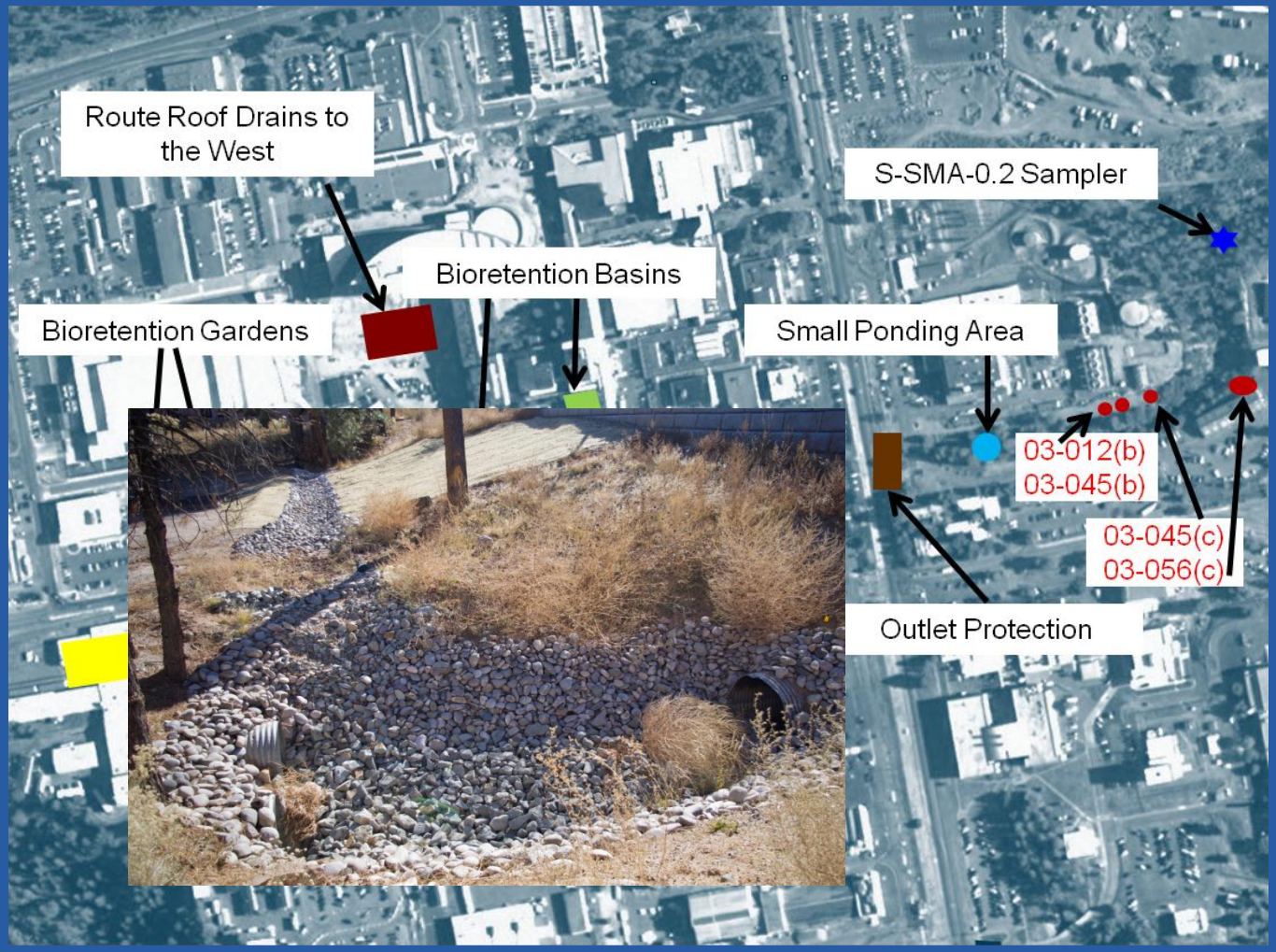


60% Review, Not for Construction

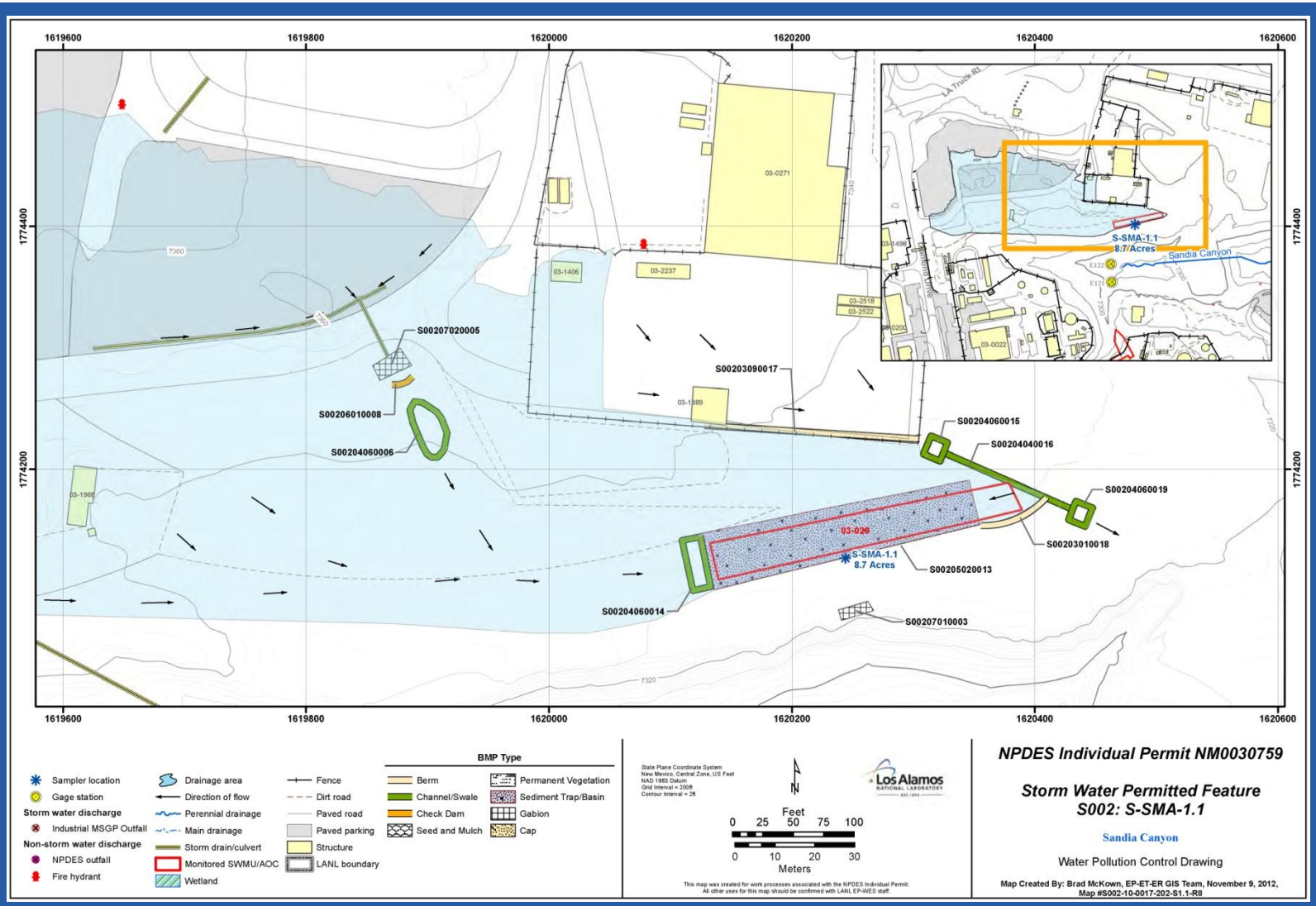
LID areas for S-SMA-2.0



LID at S-SMA-2.0

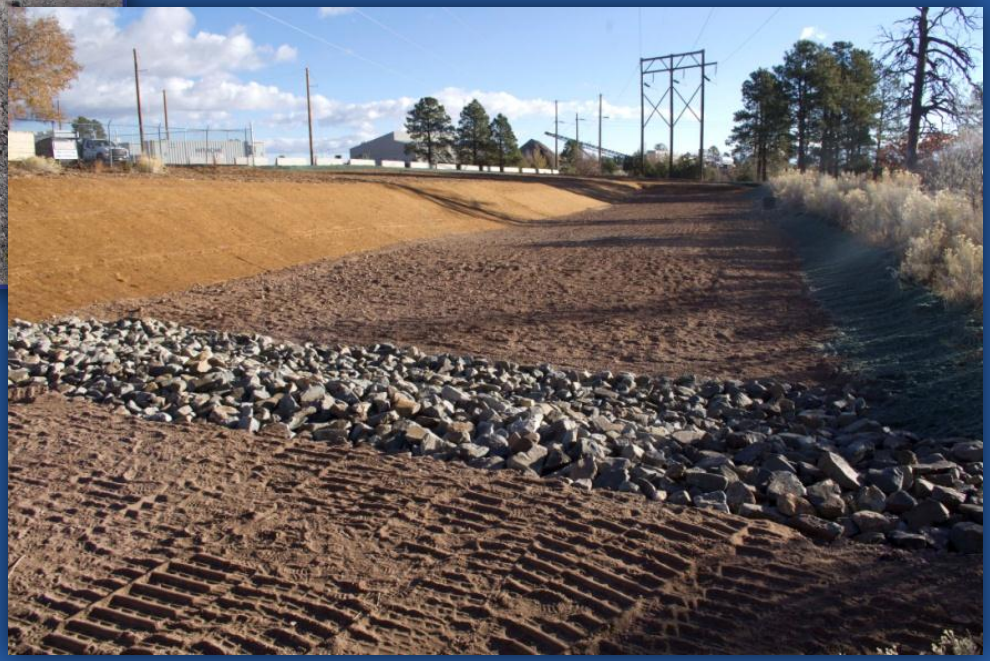


S-SMA-1.1 Integrated approach overview



S-SMA-1.1: Total Retention

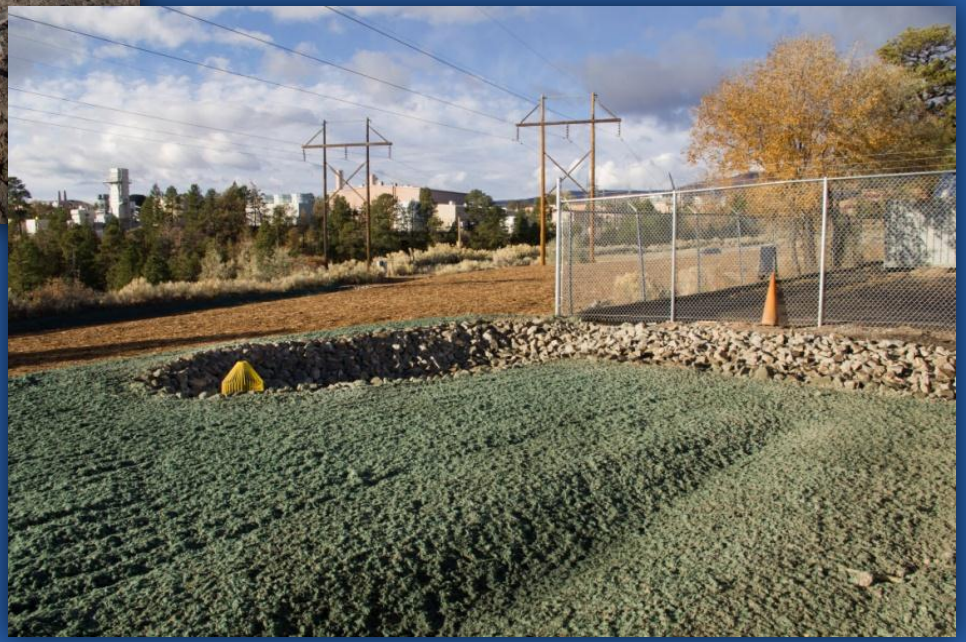
Before



After

S-SMA-1.1: Inlet protection, detention, run-on conveyance

Before



After

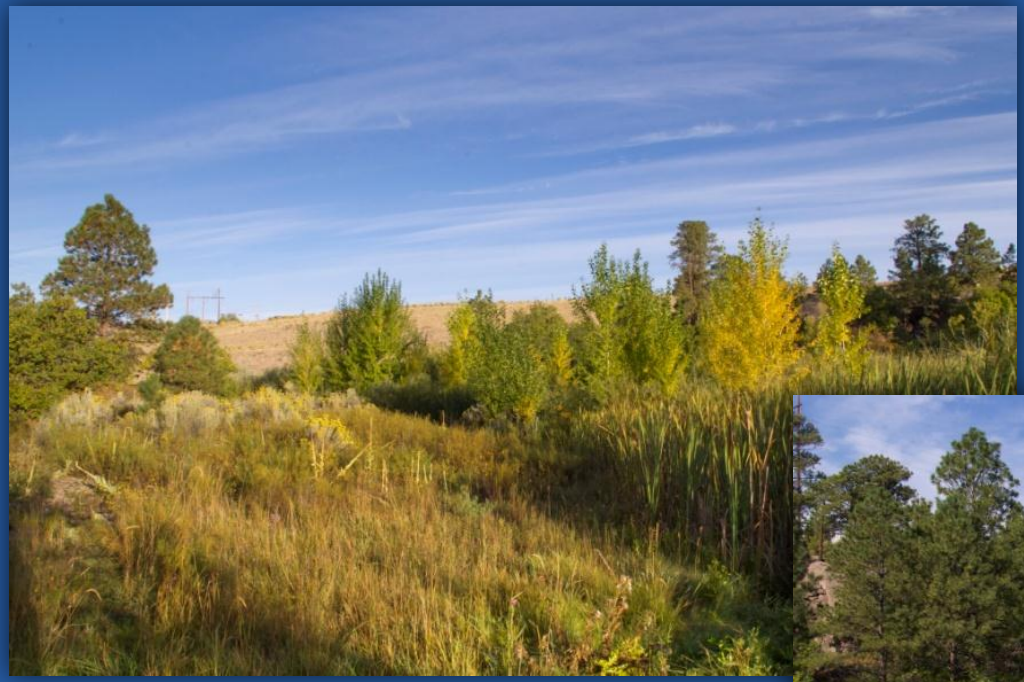
S-SMA-1.1: Outlet protection

Before

After

Wetland: Anchor Point for Upper Sandia

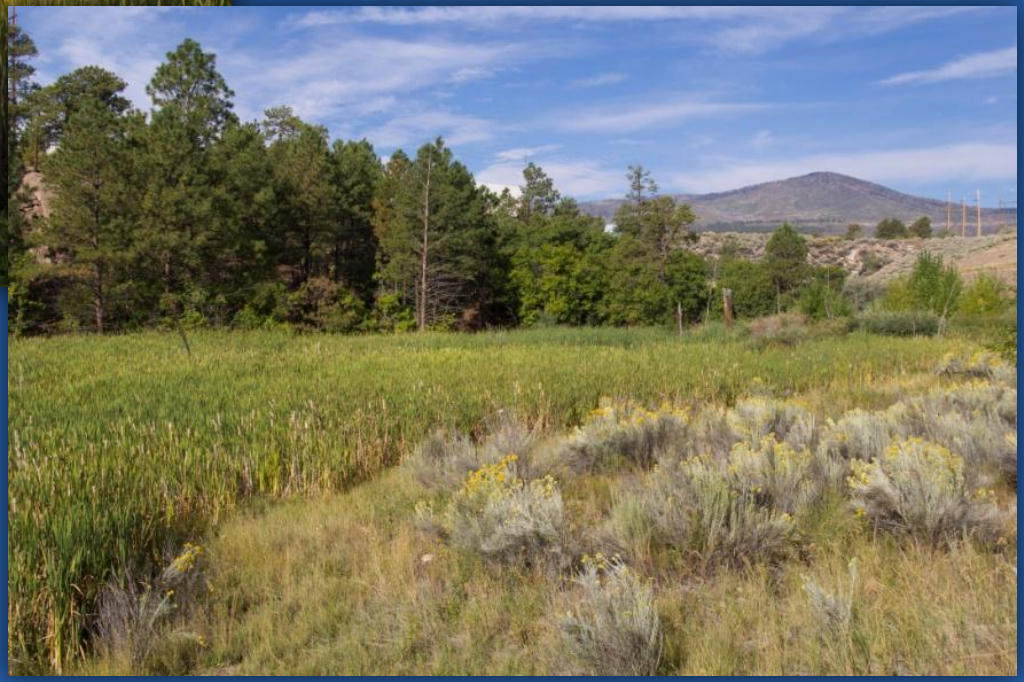
Upper Wetlands Current Conditions



Upper Wetlands

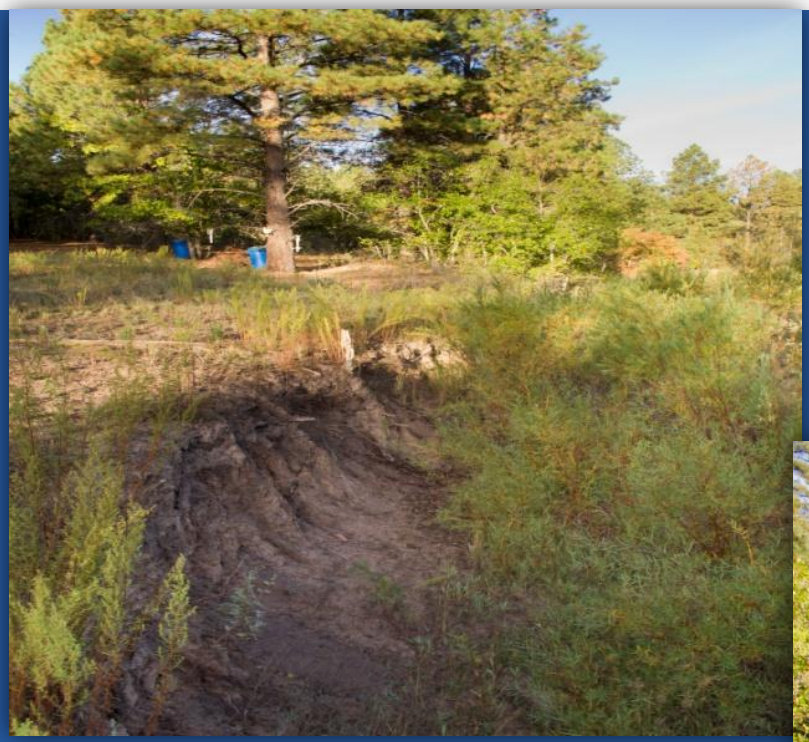
- Stable wetland environment

Middle Wetlands



- 72-inch culvert to stable basin
- Defined stream channel in upper third

Terminus Wetlands Current Conditions

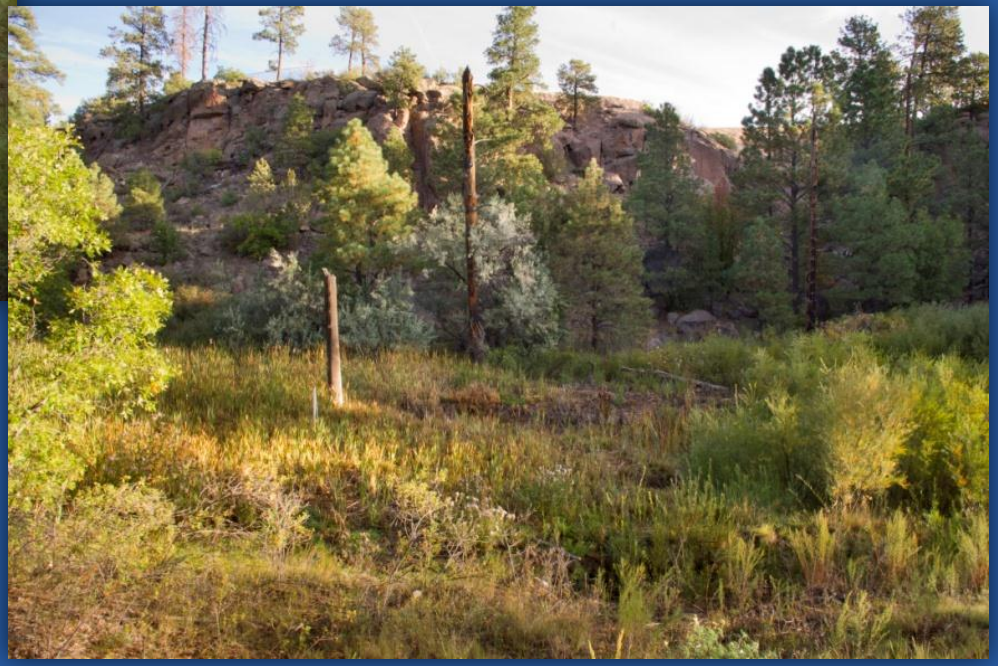


Active Headcut

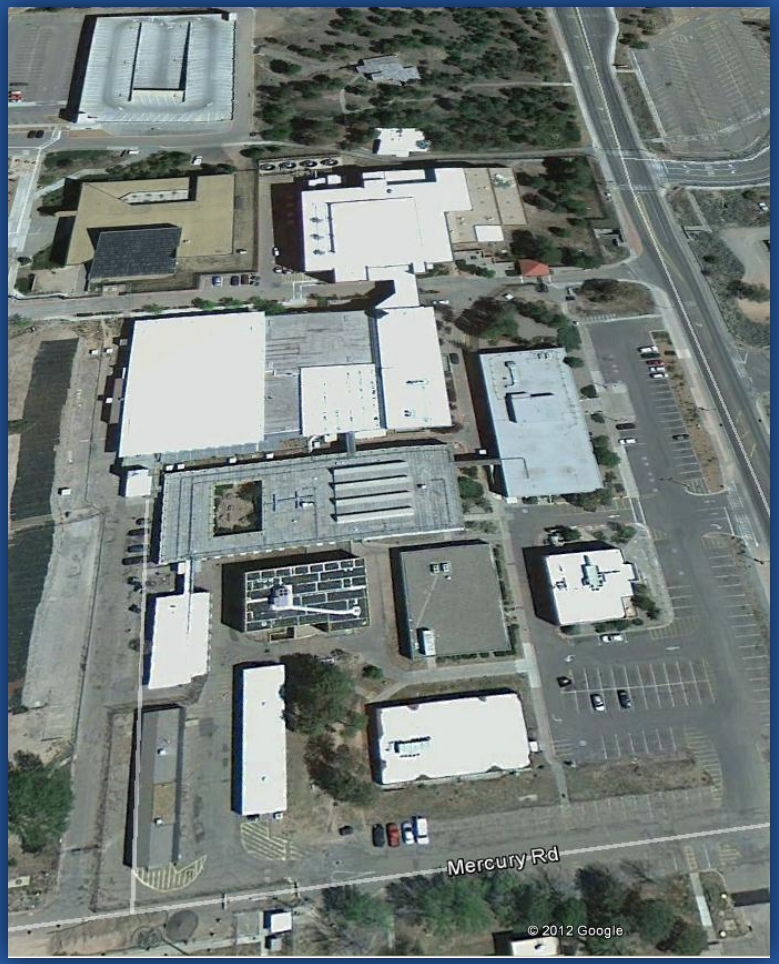
- Arrest headcut to create permanent grade
- Increase area of delineated wetland

- Restore lower wetland conditions by planting and stabilization plan

Grade Control Structures and cascading pool



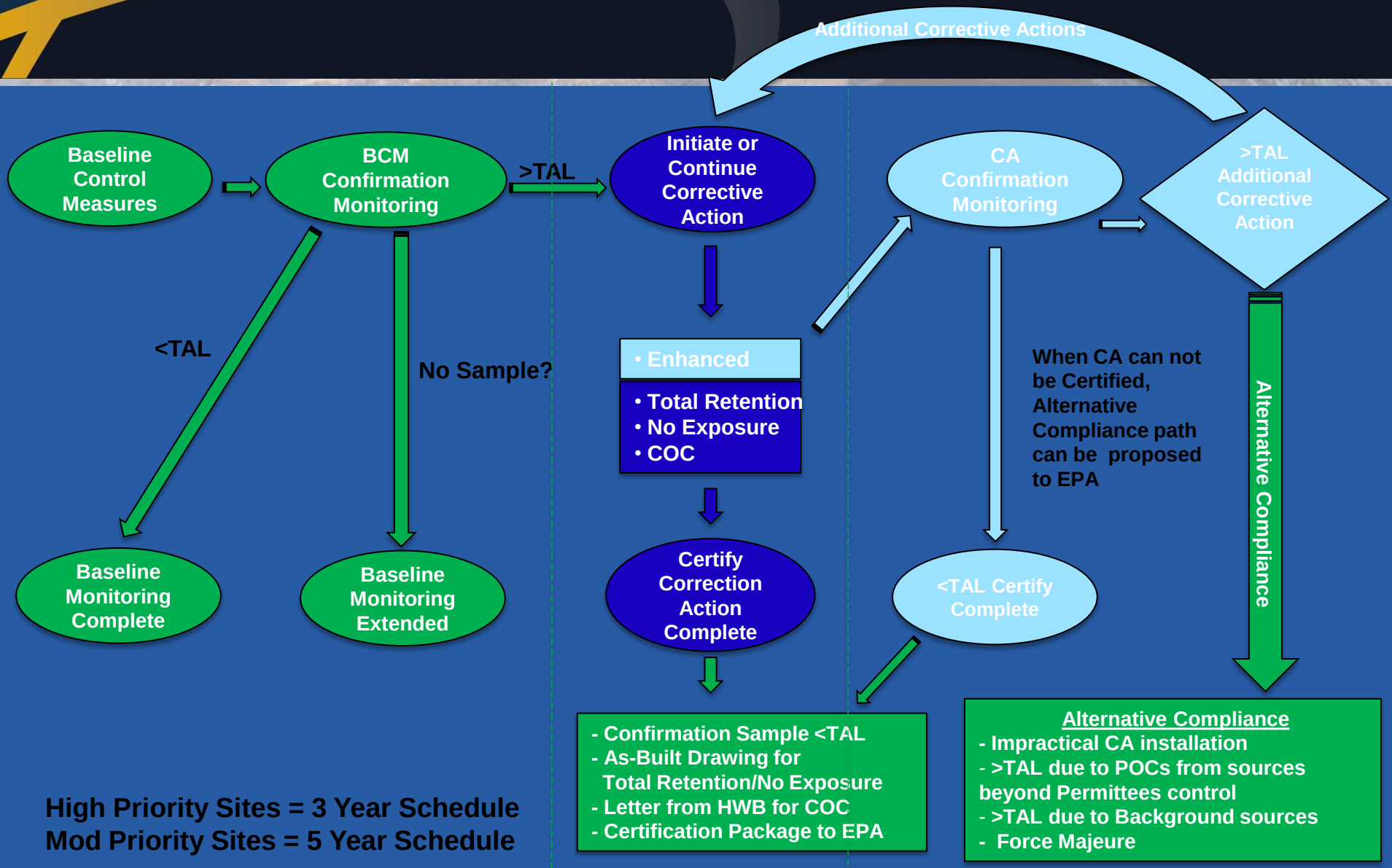
Cascading Pool Example



Alternative Compliance

Steve Veenis

Corrective Action Process/Alternative Compliance Pathway



High Priority Sites = 3 Year Schedule
Mod Priority Sites = 5 Year Schedule

Alternative Compliance Path

Potential Scenarios

- SMAs with large drainage areas within light industrial settings
  - Impractical to totally retain discharges or cover the Site
- >TAL due to Pollutants of Concern contributed by other sources
- SMAs with very low >TAL due to background concentrations
- SMAs with Force Majeure issues
  - Site Access issues
  - Long-term solutions in planning phase