

9/19/16 AGENDA, ITEM 3 - STORMWATER UPDATE

SUPPLEMENTAL PRESENTATION SUBMITTED BY ENVIRONMENTAL ANALYST KRISTY MORRIS ON 9/19/16 AT 4:30 PM

Municipal Stormwater Permit Update

Prepared for
City of Hermosa Beach




September 19, 2016

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Outline

- ➡ Background
- ➡ Proposed Structural Projects
- ➡ Non-structural Control Measures
- ➡ Planning and Land Development:
Low Impact Development



Municipal Separate Storm Sewer System (MS4) NPDES Permit for Coastal Watersheds of Los Angeles County

**Los Angeles Regional Water Quality Control Board
Order No. R4-2012-0175
Effective on December 28, 2012**

Beach Cities Watershed Group Accomplishments FY15-16

Coordinated Integrated Monitoring Program (CIMP)

- ▶ November 2015 – approved by Regional Board
- ▶ April 2016 - Beach Cities MOU execution & contract award for implementation of CIMP monitoring and reporting

Enhanced Watershed Management Program (EWMP)

- ▶ April 2016– approved by Regional Board
- ▶ Grant applications for Hermosa Greenbelt Project
- ▶ Planning for joint outreach activities

Key Hermosa Beach Individual Accomplishments FY15-16

Prepared to implement enhanced non-structural control measures:

- Inventory of public facilities and opportunities for retrofit
- Updated Illicit Discharge/Illicit Connection Program and trained field staff
- Inspectors trained on updated Clean Bay Restaurant program
- Inspectors trained on new stormwater requirements for construction sites
- Workshop with Community Development on LID implementation

Key Next Steps FY16-17

CIMP - Conduct first year of monitoring

EWMP - Beach Cities MOU for cooperation on implementation by December 2016 to include:

- Delineation of responsibility among Beach Cities agencies for structural projects
- Cooperative pursuit of funding including grants

Public Outreach - Develop updated/additional materials for residents and businesses

Permit renewal application due July 2017

Implement non-structural control measures

Green Street Projects: Planning/Design/Funding for Green Street projects

Coordinated Integrated Monitoring Program

Performance-based water quality monitoring

Paired Receiving Water and Stormwater Discharge Monitoring for 3 wet weather events per year

Santa Monica Bay

Nearshore (from boat):

- Initial list of 140 pollutants
- Aquatic toxicity

Shoreline (ankle-deep):

- Total Coliform
- Fecal Coliform
- Enterococcus

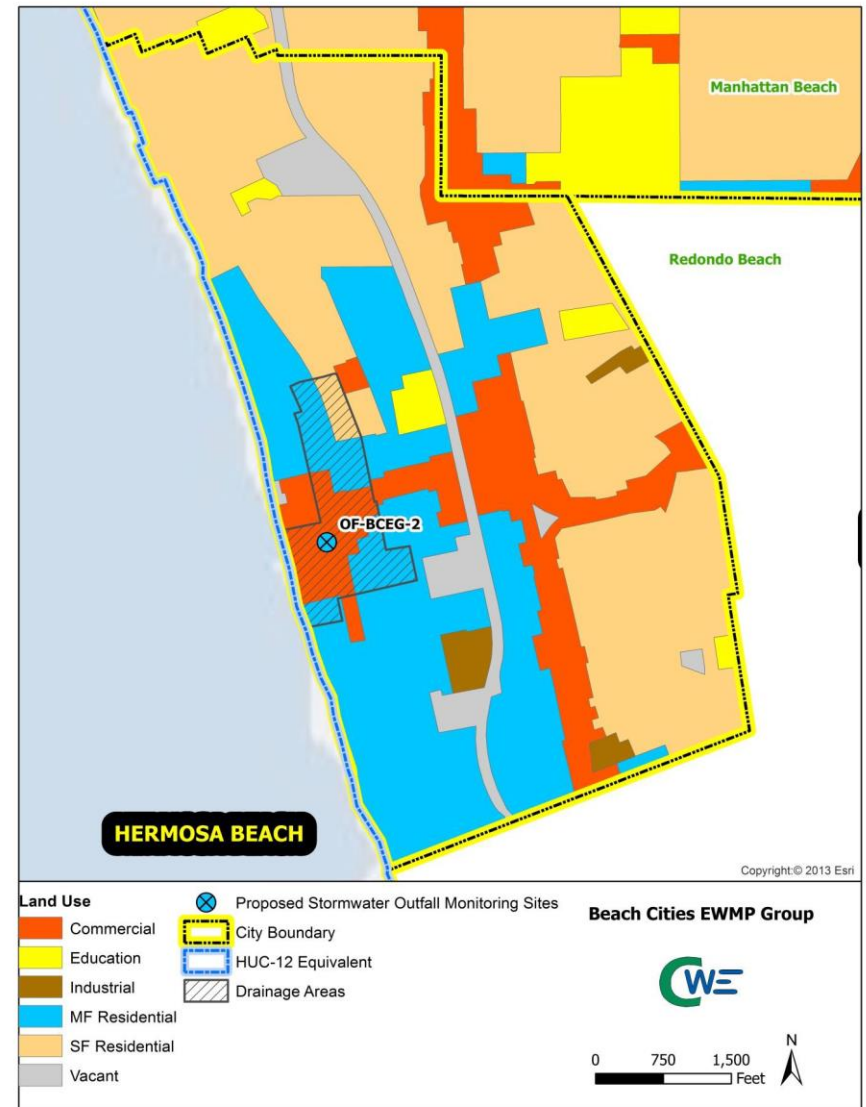
Stormwater Discharge

TMDL pollutants:

- Indicator bacteria
- DDT & PCBs

Any parameters that exceeded water quality standards in receiving water monitoring

CIMP Monitoring locations relevant to City



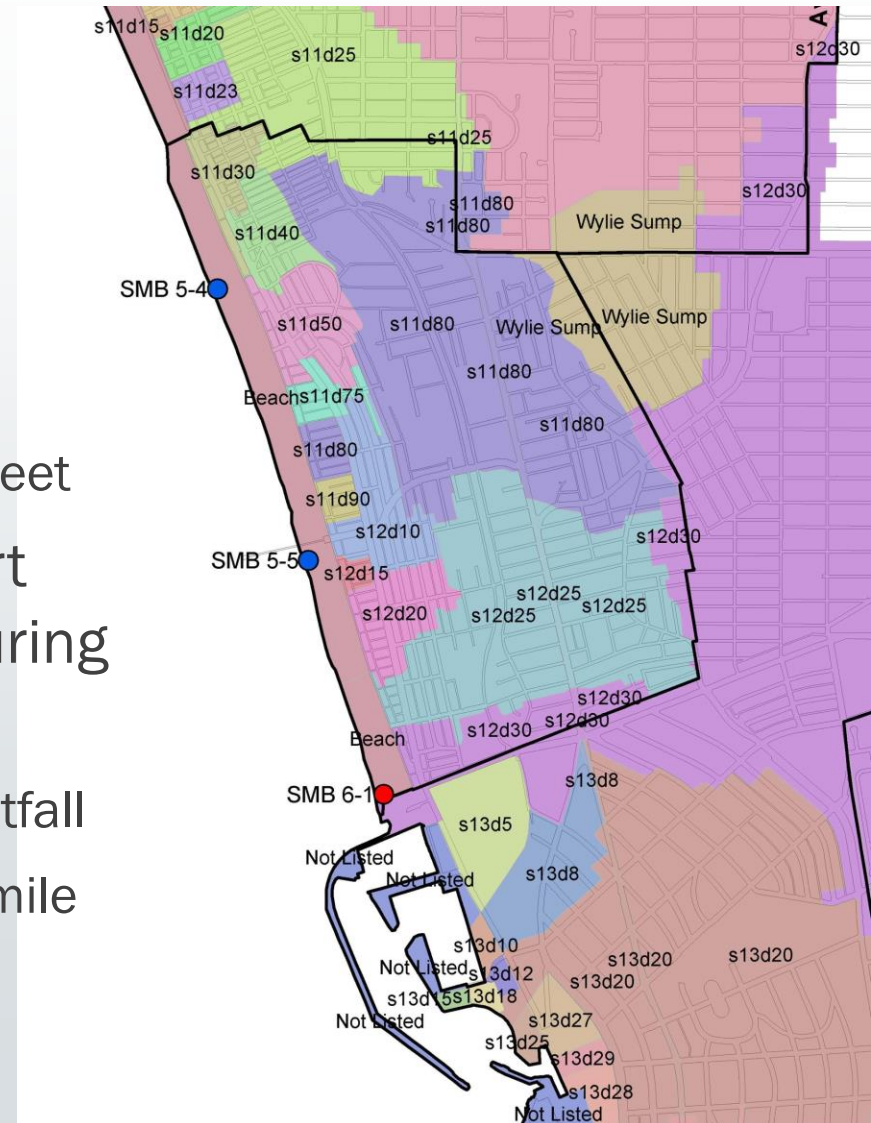
Shoreline Monitoring for Bacteria TMDL

Three (3) shoreline monitoring locations on Hermosa Beach:

- SMB 5-04 26th Street
- SMB 5-05 South of Pier
- SMB 6-01 at Herondo Street

Low Flow Diversions divert flow from storm drains during dry weather at:

- Hermosa Pier Drain at outfall
- Herondo Storm Drain ¼ mile from outfall



Enhanced Watershed Management Program (EWMP)

Submitted June 2015 by Beach Cities Watershed
Management Group

Approved April 2016, now:

Immediately begin implementing

Total Maximum Daily Loads (TMDLs)

Santa Monica Bay

Bacteria:

Summer/Winter Dry
Weather

Year-round Wet Weather

Debris (trash)

Legacy pollutants:

DDT

PCBs

EWMP Watershed Control Measures

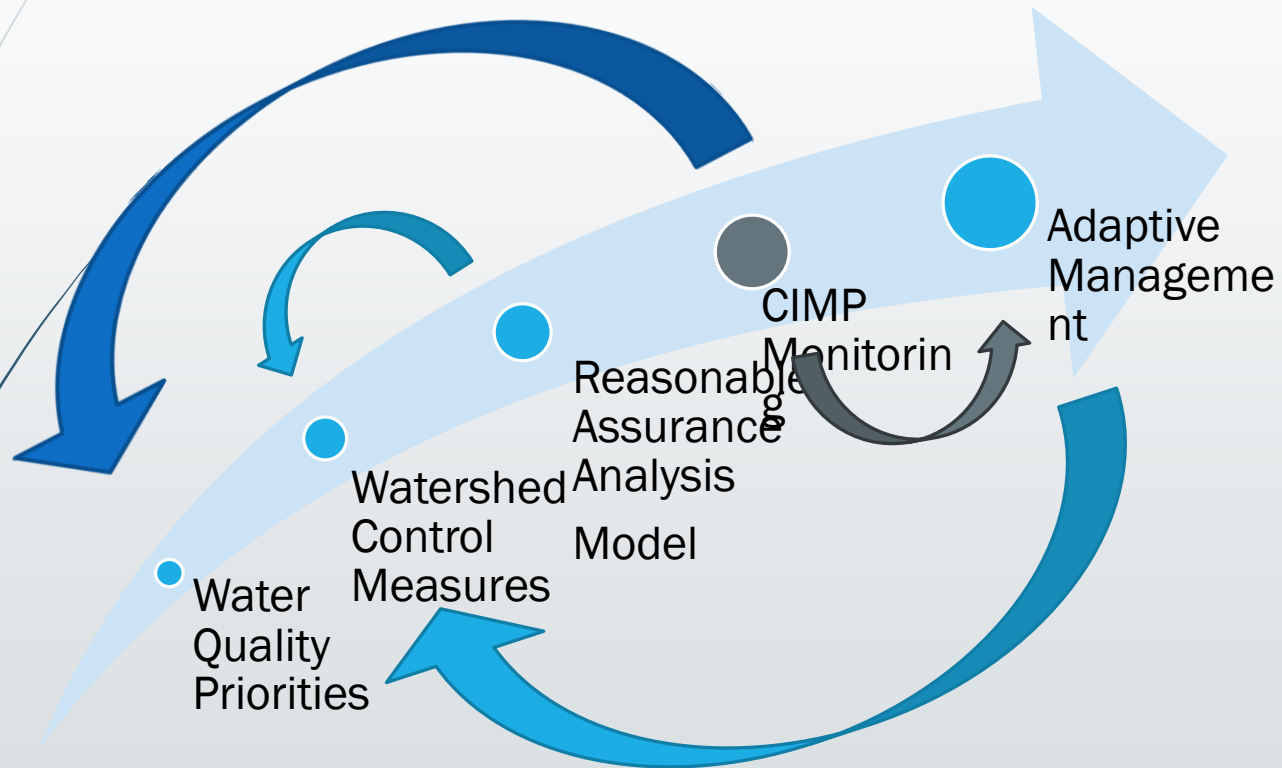
Regional Projects: capture runoff from large area

Distributed Projects: capture runoff from localized areas, e.g., Green Streets

Programmatic/Institutional Measures:

- ➡ Public Outreach
- ➡ Low Impact Development (LID) Ordinance
- ➡ Construction Site Controls
- ➡ Commercial Facility Inspections
- ➡ Public Agency Activities
- ➡ Illicit Discharges Detection and Elimination

EWMP / CIMP Interaction

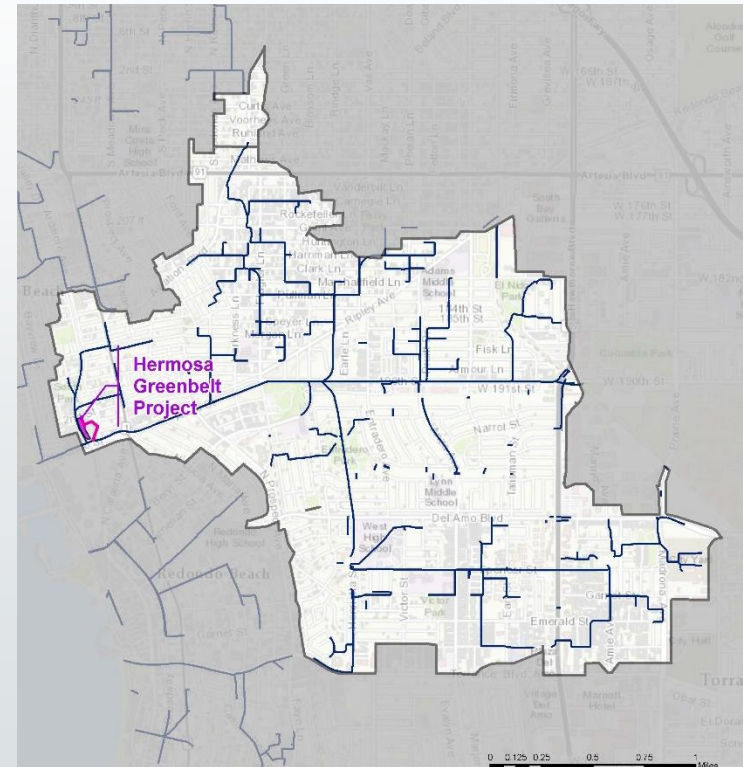


Regional and Distributed Structural Projects

Proposed in Hermosa Beach

Hermosa Greenbelt Infiltration Project Concept

- EWMP Priority Project for Herondo Storm Drain System
- 2,914 acre tributary area
98% of Herondo Storm Drain System
- Diversion flow rate of 47 cubic feet per second from Herondo Storm drain
- Subsurface infiltration gallery 600 feet long and 150 feet wide below Veterans Parkway greenbelt



Hermosa Greenbelt Infiltration Facility Overview

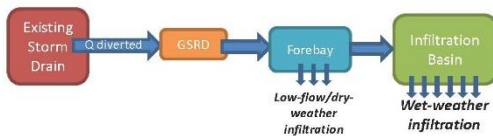
A volume reduction BMP is planned for the Hermosa Greenbelt site. Infiltration galleries function similarly to subsurface storm water detention systems but are constructed with a permeable base and sides designed to infiltrate stormwater runoff. It is usually not practical to infiltrate runoff at the same rate that it is generated; therefore, these facilities generally include both storage and drainage components. Infiltration basins remove pollutants from stormwater network by infiltrating stormwater into highly permeable engineered soil beneath the system.

Existing Site Conditions



The site is part of the 3.5-mile long Hermosa Valley Green Belt Trail in the City of Hermosa Beach.

Treatment Process

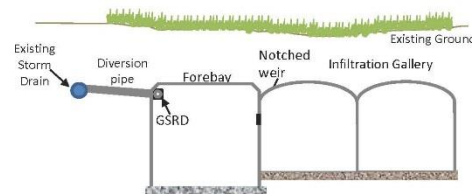


The BMP will consist of a diversion structure, conveyance pipes, a gross solids removal device (GSRD), a forebay, and an infiltration gallery. Dry- and wet-weather flows will be diverted from the existing storm and flow into the forebay through the conveyance pipe and GSRD and begin to infiltrate into native soil. Flows exceeding infiltration rate at the forebay will fill the forebay and ultimately overflow via a notched weir into the infiltration gallery, where additional infiltration will occur. The system will fill until inflows no longer exceed loss rates, at which time the basin will drawdown. When persistent flows fill the system to storage capacity, runoff in the storm drain will bypass the diversion until capacity is regained by ways of infiltration losses.

Site Configuration



Plan View (Preliminary Footprint – Subject to Change)

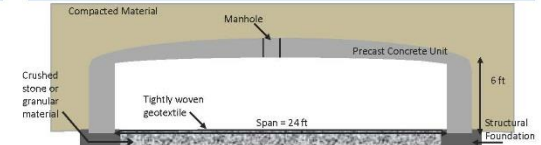


Profile (not to scale)

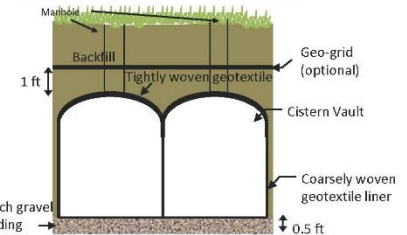
Design Parameters

General			
Tributary Area (ac)	2914	Drawdown Time (hrs)	72
Storm Drain Diverted	21" RCP	Sat. Hyd. Cond. (in/hr)	12
Design Criteria			
Max. Diversion Flow Rate (Q_{div}) (cfs)	47	Cumulative Loss Rate (cfs)	0.64
Design Storage Volume (AF)	7.3	Infiltration Footprint (ft ²)	63800
Design Parameters			
Pretreatment		Infiltration Gallery	
GSRD Length (24" diam.) (ft)	15	Gallery Footprint (ft ²)	63780
Forebay Footprint (ft ²)	4185	Gallery Length (ft)	600
Forebay Length (ft)	30	Gallery Width (ft)	150
Forebay Width (ft)	150	Gallery Ponding Depth (ft)	5
Forebay Ponding Depth (ft)	6		

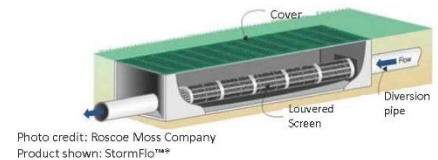
Typical Details



Forebay – Cross-section (not to scale)



Infiltration Gallery – Cross-section (not to scale)



GSRD – Isometric view (not to scale)



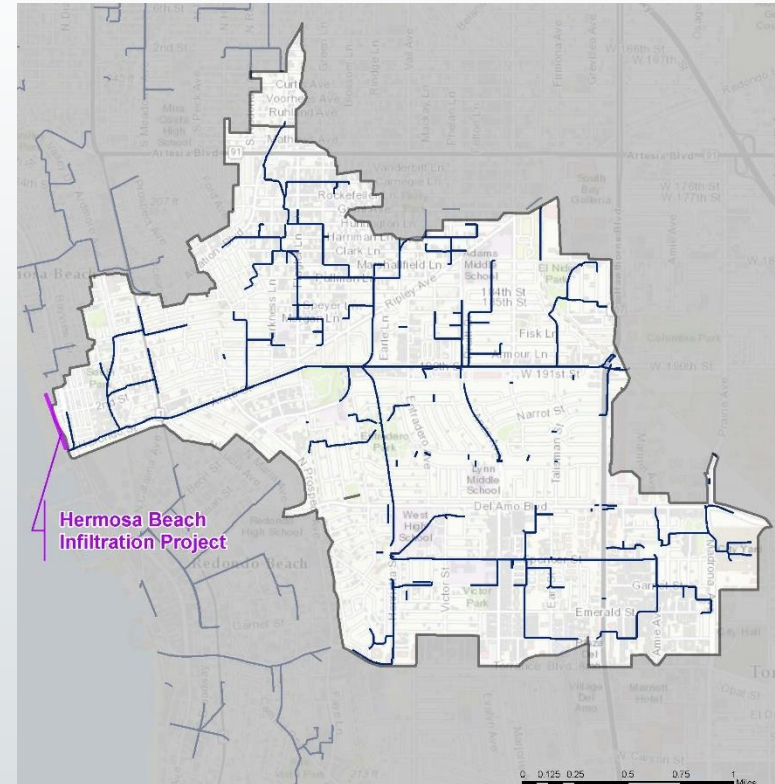
Stormwater Chambers

Hermosa Greenbelt Subsurface Infiltration Facility Conceptual Design (10% Design): Hermosa Beach		
DRAFT		Geosyntec [®] consultants
March 2016	LA0298	

*Products shown above were used as examples for sizing and cost analyses; other equivalent products may be used.

Hermosa Beach Infiltration Trench

- ▶ Tributary area is 2,957 acres (all of Herondo Storm drain system)
- ▶ Subsurface footprint of 1.5 acres: 120 feet long by 40 feet wide
- ▶ Diversion flow rate of 26 cubic feet per second
- ▶ Infiltration rate of 12 inches per hour due to highly permeable sand



Hermosa Beach Infiltration Facility Overview

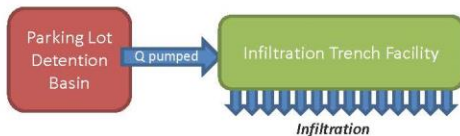
A volume reduction BMP is planned along the beach near the Herondo storm drain outfall in Hermosa Beach. Underground infiltration trenches are long, linear facilities with permeable base and sides designed to infiltrate stormwater runoff. It is usually not practical to infiltrate stormwater runoff at the same rate that it is generated; therefore, these facilities generally include both storage and drainage components. Infiltration facilities remove pollutants from stormwater network by infiltrating stormwater into the native soil beneath the system.

Existing Site Conditions



The site is a public beach located within Hermosa Beach. The beach is adjacent to a walking/bike path and consists of recreational open space.

Treatment Process



The BMP will consist of a detention basin, a pump system and an infiltration trench facility. Wet-weather flows are diverted from the Herondo storm drain and stored in the Parking Lot detention basin. The runoff is then pumped to the beach and then flow into the infiltration facility where runoff will infiltrate into native soil.

Products shown above were used as examples for sizing and cost analyses; other equivalent products may be used.

Site Configuration



Plan View (Preliminary Footprint – Subject to Change)

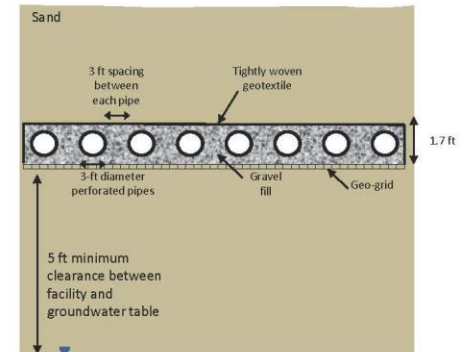
Design Parameters

General			
Tributary Area (ac)	2957	Drawdown Time (hrs)	72
Sat. Hyd. Cond. (in/hr)	12.5*		
Design Criteria			
Max. Pump Rate/Max. Design Inflow Rate (Q_{on100}) (cfs)	25	Cumulative Loss Rate (cfs)	17.05
Design Storage Volume (AF)	0.3	Infiltration Footprint (ft ²)	7700
Design Parameters			
Facility Length (ft)	120	Facility Width (ft)	40
Facility Depth (ft)	1.7		

*Based on HB Trench infiltration testing with a conservative factor of 9 applied (original source found infiltration rate to be 113 in/hr.

*BMP designed in conjunction with the Parking Lot detention facility (see Figure 14a) to achieve compliance 9 out of 10 years.

Typical Details



Infiltration Facility – Cross-section (not to scale)

*Size of individual storage cubes and number of total cubes not determined during this phase of design.



Secondary Connection to Infiltration Trench – Cross-section (not to scale)



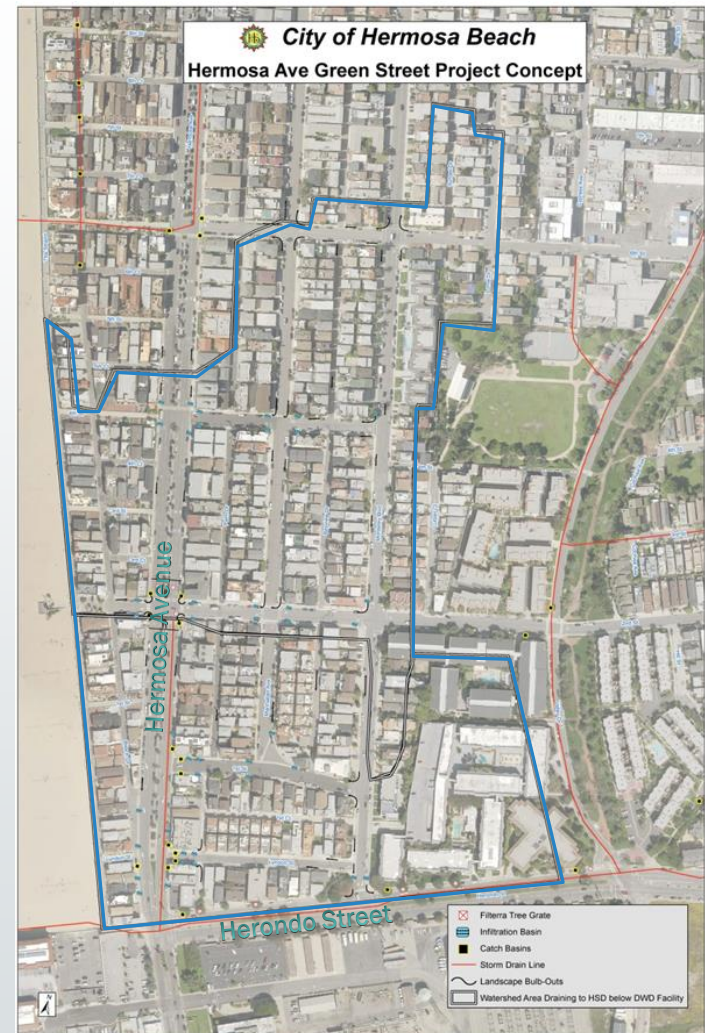
Infiltration Trench Facility

Hermosa Beach Subsurface Infiltration Facility Conceptual Design : Hermosa Beach		
DRAFT		
March 2016	LA0298	Geosyntec consultants

Green Street – Hermosa Ave & 2nd to Herondo

- 47-acre coastal sub-watershed
- Infiltrate dry and wet weather runoff from curb & gutter

(Dry weather diversion from storm drain to the sanitary sewer is not feasible due to tidal influence on storm drains)



Green Street - Beach Drive

Pervious Concrete Repaving Project



Distributed - Structural Controls for Trash



Connector Pipe Screens



Automatic retractable screens

All catch basins in the City will be retrofitted with certified full-capture Connector Pipe Screens to comply with Santa Monica Bay Debris (trash) TMDL.

Non-Structural Control Measures

New requirements that may affect residents and businesses

- Non-commercial car washing
- Landscape irrigation runoff
- Clean Bay Certified program for restaurants
- Construction sites <1 acre

Non-Commercial Car Washing by residents or non-profit organization



Encourage as many of the following BMPs as practical:

- ▶ Minimize the amount of water used by employing water conservation practices such as turning off nozzles when not spraying a car, and using a low volume pressure washer.
- ▶ use biodegradable, phosphate free detergents and non-toxic cleaning products,
- ▶ or empty buckets of soapy or rinse water into the sanitary sewer system (e.g., sinks or toilets)
- ▶ Where possible, wash cars on a permeable surface where wash water can percolate into the ground (e.g. gravel or grassy areas)
- ▶ Divert discharge away from or remove potential sources of pollutants in the flow path to the MS4.

Landscape Irrigation

- Minimize runoff
- Implement water conservation programs to minimize discharge:
 - ✓ Water efficient landscaping ordinance
 - ✓ Outreach and education

Construction Sites < 1 Acre

Effective Combination of Minimum

BMPS:

- Scheduling to minimize stormwater exposure
- Preserve existing vegetation
- Silt fence
- Sand bag barrier
- Stabilized Construction Site Entrance/Exit
- Water Conservation practices
- Permit for dewatering operation
- Material delivery and storage
- Stockpile management
- Spill prevention and Control
- Solid waste management
- Concrete waste management
- Sanitary/septic waste management

Planning & Land Development:

New Low Impact Development Ordinance began implementation FY15-16



Low Impact Development (LID)

Building and landscape features designed to retain or filter runoff by:

- Minimizing impervious surface area
- Controlling runoff from impervious surface through infiltration, bioretention, and/or rainfall harvest and use

LID = Reduce Imperviousness + structural BMPs

LID Applicability: New Developments

All new development projects – no size threshold.

New development includes:

- Land disturbing activities
- Structural development, including construction or installation of a building or structure
- Demolition of existing development and construction of a new building or structure
- Creation of impervious surfaces
- Land subdivision

LID Applicability: Redevelopment

Creation, addition, or replacement of impervious surfaces on an already developed site, including:

1. expansion of a building footprint, an addition, or replacement of a structure;
2. development of a structure, including an increase in impervious area
3. replacement of impervious surface that is not part of a routine maintenance activity; and
4. land disturbing activities related to structural or impervious surfaces.

Redevelopment does not include routine maintenance activities.

LID Applicability: Redevelopment Impervious Area Thresholds

Land disturbing activity resulting in creation, addition, or replacement of

- **2,500 ft²** for projects adjacent to or discharging directly into a Significant Ecological Area identified in the HB Coastal Land Use Plan
- **5,000 ft² or more** for all other (most) projects

**Alterations to >50% of existing impervious surface
must mitigate the entire project**

**Alterations to <50% of existing impervious surface
must mitigate the alteration only**

Project Design Requirements*

Retain on site (infiltrate or store for use)

Storm Water Quality Design Volume (SWQDv)

volume of runoff from 0.8 inch storm

- ➡ Infiltration
- ➡ Bioretention (retention, no underdrain) per design specifications in Attachment H of MS4 Permit.
- ➡ Rainfall harvest and use

Consider maximum potential for evapotranspiration from green roofs and rainfall harvest and use **before making finding of infeasibility**

** Not applicable to green streets*

Alternative Compliance

Technical Infeasibility or Regional Groundwater Replenishment

On-site biofiltration

(flow-through with underdrain, incidental infiltration), to filter 1.5 x the non-retained SWQDv

Offsite:

- Infiltration
- Groundwater replenishment
- Retrofit of existing development

Regional or sub-regional stormwater mitigation program
(approved by Regional Water Board)

*Projects approved for offsite mitigation or groundwater replenishment **must still implement onsite BMPs to treat SWQDv** even if the volume is not retained onsite*

Green Street Policy

Applies to standalone streets, roads, and highways, and also applies to streets within larger projects:

- new street projects \geq 10,000 square feet
- redevelopment \geq 5,000 square feet

Does not apply to routine maintenance projects

BMP Selection and Design Standard: ***LA County Low Impact Development Standards Manual***

Director of Public Works has final authority regarding technical feasibility of BMPs.

Planning & Land Development

- ▶ Must track cumulatively over time to show effectiveness since permit adoption
- ▶ Summarize all mitigated projects
- ▶ Use project design data collected from project applicants to:
 - ▶ Calculate cumulative percent change in Effective Impervious Area
 - ▶ Estimate change in runoff volume during the 85th percentile storm

Since very few redevelopment projects trigger the 5,000 ft² threshold and there are few new developments, City will have little progress to report in reducing runoff and effective impervious area

Discussion/Questions

