

**Storm Water Management Plan
For Priority Projects
(Major SWMP)**

Project Name:	Fallbrook Hills ER 04-02-002
Permit Number (Land Development Projects):	TPM20800 RPL1 STP-06-013
Work Authorization Number (CIP):	Not assigned
Applicant:	Cross Roads LLC
Applicant's Address:	9255 Town Center Dive, #450 San Diego CA 92121
Plan Prepare By (<i>Leave blank if same as applicant</i>):	Kevin Bresnahan, Civil Engineer ~ License No. 59954 31805 Highway 79 South #196, Temecula CA 9252 Phone: (951) 532-6371, Fax: (760) 454-1761
Date:	July 6, 2006
Revision Date (If applicable):	-----

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity must be accompanied by a Storm Water Management Plan (SWMP) (section 67.804.f). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Review Stage	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	

Instructions for a Major SWMP can be downloaded at <http://www.co.sandiego.ca.us/dpw/stormwater/susmp.html>.

The following completed checklist and attachments will fulfill the requirements of a Major SWMP for the project listed above.

PROJECT DESCRIPTION

Project Location

The project is located in the unincorporated community of Fallbrook (See Appendix A, Site Exhibits). The 15.73-acre site is approximately 5 miles due east of downtown Fallbrook and adjacent to Old Highway 395 and Interstate 15. Access to the project area is from Reche Road. Specifically, Ranger Road is about two tenths of a mile west of Old Highway 395 along Reche Road. The project consists of two parcels, APN 108-161-0500 and APN 108-161-0600. Both are located on the east side of Ranger Road. The site address is 1248 Ranger Road. The site can be described as being a portion of Monserate Rancho and a portion of southwest quarter of Section 23, Township 9 South, Range 3 West, and San Bernardino Base Meridian. The site can be found on the USGS Quadrangle sheet is entitled "Temecula".

The approximate geographic position of the project is
Latitude: 33° 22' 30" North. Longitude; 117° 10' 15" West

Site Description

The triangular shaped project covers nearly 16 acres of rolling terrain. The prominent feature of the site is a ridgeline that trends north to south. The useable land is west of the ridge. The site is utilized as a whole palm tree nursery. The project has an east-west dimension of nearly 1200 at it's widest and a dimension of 2000 feet north to south. The parcel has a maximum elevation of over 740 feet on the ridgeline. The lowest points of the site are in the southwest and southeast corners. Those elevations are about 570 Mean Sea Level. The majority of the site has a western exposure. The eastern portion of the site has slopes in excess of 60 percent. There are two historical drainage courses which trend from the north to south. The western course is basically a roadside ditch, which is on the easterly side of Ranger Road. The slope of the ditch varies between 4-percent and 6-percent. The near natural channel along the eastern edge and next to Old Highway 395 is sloped at about 5-percent. This drainage course is very deep with very steep sides. (130 feet on the westerly side and about 30 on the east) There are several structures on this parcel, including two concrete water reservoirs and a residential unit. The residential dwelling will be on the remainder parcel after the project concludes

The site is entirely with in the San Luis Rey Watershed, Hydrologic Unit 903. Specifically it is in the Lower San Luis Rey Hydrologic Area, (HA 903.12) and entirely in the Bonsall Hydrologic Sub-Area (HSA 903.12). (See Appendix A, Site Exhibits)

Project Description

Cross Roads L.L.C. has retained Kevin Bresnahan, Civil Engineer and Eyerman Land Surveying Inc. to prepare and submit to the County of San Diego documents for the subdivision and development of APN 108-161-0500 and 108-161-0600. This storm water management plan study is in support of those documents. The development plans includes the grading of four building pads and a private road.

PRIORITY PROJECT DETERMINATION

Please check the box that best describes the project. Does the project meet one of the following criteria?

PRIORITY PROJECT	YES	NO
Redevelopment within the County Urban Area that creates or adds at least 5,000 net square feet of additional impervious surface area	✓	
Residential development of more than 10 units		✓
Commercial developments with a land area for development of greater than 100,000 square feet		✓
Automotive repair shops		✓
Restaurants, where the land area for development is greater than 5,000 square feet		✓
Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface		✓
Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.		✓
Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff		✓
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater	✓	

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria above are met.

If you answered **NO** to all the questions, then **STOP**. Please complete a Minor SWMP for your project.

If you answered **YES** to any of the questions, please continue.

The following questions provide a guide to collecting information relevant to project storm water quality issues. Please provide a description of the findings in text box below.

	QUESTIONS	COMPLETED	NA
1.	Describe the topography of the project area.	✓	
2.	Describe the local land use within the project area and adjacent areas.	✓	
3.	Evaluate the presence of dry weather flow.	✓	
4.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	✓	
5.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	✓	
6.	Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.	✓	
7.	Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.	✓	
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	✓	
9.	If considering Treatment BMP's, determine the soil classification, permeability, erodibility, and depth to groundwater.		✓
10.	Determine contaminated or hazardous soils within the project area.		✓

Please provide a description of the findings in the following box:

The project is located in the San Luis Rey River watershed draining to the lower San Luis Rey Hydrologic Unit (903.1), ultimately to the San Luis Rey River via unnamed creeks. The current land use of Assessor's parcel 108-161-05 & 06 is agriculture and is zoned A-70. The density is classified as Low Density Residential 0.50.DU/Ac (1dwelling unit per two acres) and Low Density Residential 1.0.DU/Ac (1 dwelling unit per acre), respectively. The proposed land use of the properties will be for single-family dwellings. The proposed parcels will be classified as Low Density Residential 1.0.DU/Ac (1dwelling unit per acre). The proposed zoning will follow the San Diego General Plan categories #1 Residential / #17 Estate. The majority of the area is characterized by rolling hills currently utilized to as growing grounds for container plants. The eastern portion of the site is characterized by steep sloping terrain that will be left undisturbed by the proposed development. Swales within the developed portion of site flow only during and briefly after storm events. An perennial creek occurs along the sites eastern boundary, the tributary area of said creek within the site boundaries will remain undisturbed and most likely be designated open space due to the county of San Diego's steep slope policy. Runoff from the project drains into unnamed roadside creeks and eventually to the San Luis Rey River. No municipal water supply reservoirs or ground water percolation facilities exist on or near the project site. Existing domestic water storage reservoirs on the northern portion of the site are presently abandoned and will be discarded with the projects implementation. Within the project limit there are no 303(d) impaired receiving waters and no Regional Board special requirements. Climate data and Rainfall intensity isopluals have been attached to the appendices for reference. The local on-site soil types were determined to be in the Hydrologic Soil Group "B" (San Diego County Soil Survey). There are three types of underlying soils. These soils are classified as 1) Vista Course Sandy Loam (VsG) with slopes 30% to 60%; 2) Vista Course Sandy Loam (VsE) with slopes 15% to 30%; and 3) Fallbrook Sandy Loam (FaD2) with slopes 9% to 15%. Utilizing treatment BMP's that maintain runoff velocities of less than 5 feet per second, erosion should not be an issue with said soils. Permeability of the onsite soil has been established via recorded septic percolation records. Soils have been identified to percolate with adequate depth to ground water for on-site sewage disposal per State Water resource Control Boards requirements. No studies have been provided to indicate that contaminated soils or hazardous soils occur within the project site.

Complete the checklist below to determine if Treatment Best Management Practices (BMPs) are required for the project :

No.	CRITERIA	YES	NO	INFORMATION
1.	Is this an emergency project		✓	If YES, go to 6. If NO, continue to 2.
2.	. Have TMDLs been established		✓	If YES, go to 5.
3.	Will the project directly discharge to a 303(d) impaired receiving water body?		✓	If YES, go to 5. If NO, continue to
4.	Is this project within the urban and environmentally sensitive areas as defined on the maps in Appendix B of the <i>County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects</i> ?	✓		If YES, continue to 5. If NO, go to 6.
5.	Consider approved Treatment BMPs for the project.	✓		If YES, go to 7.
6.	Project is not required to consider Treatment BMPs			Document for Project Files by referencing this checklist.
7.	End	✓		

Now that the need for a treatment BMPs has been determined, other information is needed to complete the SWMP.

WATERSHED

Please check the watershed(s) for the project.

- | | | | |
|---------------------------------------|--|--|---|
| <input type="checkbox"/> San Juan | <input type="checkbox"/> Santa Margarita | <input checked="" type="checkbox"/> San Luis Rey | <input type="checkbox"/> Carlsbad |
| <input type="checkbox"/> San Dieguito | <input type="checkbox"/> Penasquitos | <input type="checkbox"/> San Diego | <input type="checkbox"/> Pueblo San Diego |
| <input type="checkbox"/> Sweetwater | <input type="checkbox"/> Otay | <input type="checkbox"/> Tijuana | |

Please provide the hydrologic sub-area and number(s)

Number	Name
903.12	Bonsall

Please provide the beneficial uses for Inland Surface Waters and Ground Waters. Beneficial Uses can be obtained from the Water Quality Control Plan For The San Diego Basin, which is available at the Regional Board office or at <http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html>.

SURFACE WATERS	Hydrologic Unit Basin Number	M	A	I	P	G	F	P	R	R	B	W	C	W	R	S
		U	G	N	R	R	R	O	O	E	E	I	A	O	I	A
		N	R	D	O	W	S	W	C	C	O	R	L	L	R	W
Inland Surface Waters	903.12	*	x	x					x	x		x		x	x	
Ground Waters	None identified															

X Existing Beneficial Use
 0 Potential Beneficial Use
 * Excepted from Municipal

POLLUTANTS OF CONCERN

Using Table 1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

Table 1. Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >100,000 ft2	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Automotive Repair Shops			X	X (4&5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
 P = potential
 (1) A potential pollutant if landscaping exists on-site.
 (2) A potential pollutant if the project includes uncovered parking areas.
 (3) A potential pollutant if land use involves food or animal waste products.
 (4) Including petroleum hydrocarbons.
 (5) Including solvents.

Note: If other monitoring data that is relevant to the project is available. Please include as Attachment C.

CONSTRUCTION BMPs

Please check the construction BMPs that may be used. The BMPs selected are those that will be implemented during construction of the project. The applicant is responsible for the placement and maintenance of the BMPs selected.

- | | |
|---|--|
| <input checked="" type="checkbox"/> Silt Fence | <input type="checkbox"/> Desilting Basin |
| <input checked="" type="checkbox"/> Fiber Rolls | <input checked="" type="checkbox"/> Gravel Bag Berm |
| <input checked="" type="checkbox"/> Street Sweeping and Vacuuming | <input type="checkbox"/> Sandbag Barrier |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection | <input checked="" type="checkbox"/> Material Delivery and Storage |
| <input checked="" type="checkbox"/> Stockpile Management | <input checked="" type="checkbox"/> Spill Prevention and Control |
| <input checked="" type="checkbox"/> Solid Waste Management | <input checked="" type="checkbox"/> Concrete Waste Management |
| <input checked="" type="checkbox"/> Stabilized Construction Entrance/Exit | <input checked="" type="checkbox"/> Water Conservation Practices |
| <input type="checkbox"/> Dewatering Operations | <input checked="" type="checkbox"/> Paving and Grinding Operations |
| <input checked="" type="checkbox"/> Vehicle and Equipment Maintenance | |
- Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval

SITE DESIGN

To minimize stormwater impacts, site design measures must be addressed. The following checklist provides options for avoiding or reducing potential impacts during project planning. If YES is checked, it is assumed that the measure was used for this project. If NO is checked, please provide a brief explanation why the option was not selected in the text box below.

	OPTIONS	YES	NO	N/A
1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?			✓
2.	Can the project be designed to minimize impervious footprint?	✓		
3.	Conserve natural areas where feasible?	✓		
4.	Where landscape is proposed, can rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?	✓		
5.	For roadway projects, can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?			✓
6.	Can any of the following methods be utilized to minimize erosion from slopes:			
	6.A Disturbing existing slopes only when necessary?	✓		
	6.B . Minimize cut and fill areas to reduce slope lengths?	✓		
	6.C . Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?			✓
	6.D Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?			✓
	6.E Rounding and shaping slopes to reduce concentrated flow?	✓		
	6.F Collecting concentrated flows in stabilized drains and channels?	✓		

Please provide a brief explanation for each option that was checked N/A or NO in the following box.

Proposed project has been located outside of identified hillside regions (steep slopes of 25% plus) and riparian habitat, no other critical or problematic entities occur to design around. Slopes on projects are minimal, providing terracing or retaining walls would provide a greater land disturbance with little benefit.

If the project includes work in channels, then complete the following checklist. Information shall be obtained from the project drainage report.

	OPTIONS	YES	NO	N/A	
1.	Will the project increase velocity or volume of downstream flow?			✓	If YES go to 5.
2.	Will the project discharge to unlined channels?			✓	If YES go to 5.
3.	Will the project increase potential sediment load			✓	If YES go to 5.
4.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect upstream and/or downstream channel stability?			✓	If YES go to 7.
5.	Review channel lining materials and design for stream bank erosion.			✓	If YES go to 6.
6.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.			✓	If YES go to 7.
7.	Include, where appropriate, energy dissipation devices at culverts.			✓	If YES go to 8.
8.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.			✓	If YES go to 9.
9.	Include, if appropriate, detention facilities to reduce peak discharges.			✓	
10.	“Hardening“ natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless predevelopment conditions are determined to be so Erosive that hardening would be required even in the absence of the proposed development.			✓	If YES go to 11.
11.	Provide other design principles that are comparable and equally effective.			✓	If YES go to 12.
12.	End				

Note: no channel work occurs within the scope of this project.

SOURCE CONTROL

Please complete the following checklist for Source Control BMPs. If the BMP is not applicable for this project, then check N/A only at the main category.

BMP		YES	NO	N/A
1.	Provide Storm Drain System Stenciling and Signage			
1.A	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING – DRAINS TO _____") and/or graphical icons to discourage illegal dumping.	✓		
1.B	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area			✓
2.	Design Outdoors Material Storage Areas to Reduce Pollution Introduction			
2.A	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.		✓	
2.B	Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.	✓		
2.C	The storage area shall be paved and sufficiently impervious to contain leaks and spills.		✓	
2.D	The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.		✓	
3.	Design Trash Storage Areas to Reduce Pollution Introduction			✓
3.A	Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,			
3.B	Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.			
4.	Use Efficient Irrigation Systems & Landscape Design			
4.A	The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.	✓		
4.B	Designing irrigation systems to each landscape area's specific water requirements.		✓	
4.C	Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.		✓	
4.D	Employing other comparable, equally effective, methods to reduce irrigation water runoff.		✓	
5.	Private Roads			
	The design of private roadway drainage shall use at least one of the following			
5.A	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	✓		
5.B	Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter		✓	
5.C	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high Flows connect directly to storm water conveyance system.		✓	
BMP		YES	NO	N/A
5.D	Other methods that are comparable and equally effective within the project.		✓	

6.	Residential Driveways & Guest Parking				
	The design of driveways and private residential parking areas shall use one at least of the following features.				
6.A	Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.			✓	
6.B	Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.	✓			
6.C	Other features which are comparable and equally effective.			✓	
7.	Dock Areas				✓
	Loading/unloading dock areas shall include the following.				
7.A	Cover loading dock areas, or design drainage to preclude urban run-on and runoff.				
7.B	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited				
7.C	Other features which are comparable and equally effective.				
8.	Maintenance Bays				✓
	Maintenance bays shall include the following.				
8.A	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff				
8.B	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.				
8.C	Other features which are comparable and equally effective.				
9.	Vehicle Wash Areas				✓
	Priority projects that include areas for washing/steam cleaning of vehicles shall use the following				
9.A	Self-contained; or covered with a roof or overhang.				
9.B	Equipped with a clarifier or other pretreatment facility.				
9.C	Properly connected to a sanitary sewer				
9.D	Other features which are comparable and equally effective.				
10.	Outdoor Processing Areas				✓
	Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.				
10.A	Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.				
	BMP		YES	NO	N/A
10.B	Grade or berm area to prevent run-on from surrounding areas.	✓			
10.C	Installation of storm drains in areas of equipment repair is prohibited.				✓
10.D	Other features which are comparable or equally effective.	✓			
11.	Equipment Wash Areas				✓

	Outdoor equipment/accessory washing and steam cleaning activities shall be.			
11.A	Be self-contained; or covered with a roof or overhang.			
11.B	Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate			
11.C	Be properly connected to a sanitary sewer.			
11.D	Other features which are comparable or equally effective.			
12.	Parking Areas			
	The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.			
12.A	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	✓		
12.B	Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.			✓
12.C	Other design concepts that are comparable and equally effective		✓	
13.	Fueling Area			✓
	Non-retail fuel dispensing areas shall contain the following.			
13.A	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			
13.B	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			
13.C	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			
13.D	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			

Please list other project specific Source Control BMPs in the following box. Write N/A if there are none and briefly explain.

Construction BMP's for maintenance, fueling and washing of vehicles. Checklist adequately provides for project requirements. Construction BMP's must be planned and identified at time of plan preparation to accommodate phasing of project.

TREATMENT CONTROL

To select a structural treatment BMP using Treatment Control BMP Selection Matrix (Table 2), each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 1). Any pollutants identified by Table 1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall select a single or combination of stormwater BMPs from Table 2, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern.

Priority projects that are **not** anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall select a single or combination of stormwater BMPs from Table 2, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the “maximum extent practicable” standard.

Table 2. Treatment Control BMP Selection Matrix

<i>Pollutant of Concern</i>	<i>Treatment Control BMP Categories</i>						
	Biofilters	Detention Basins	Infiltration Basins(2)	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems(3)
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	M	L	M	L
Trash & Debris	L	H	U	H	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	H	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	L	L	U	L

(1) Copermitees are encouraged to periodically assess the performance characteristics of many of these BMPs to update this table.
(2) Including trenches and porous pavement.
(3) Also known as hydrodynamic devices and baffle boxes.
L: Low removal efficiency:
M: Medium removal efficiency:
H: High removal efficiency:
U: Unknown removal efficiency
Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), *Guide for BMP Selection in Urban Developed Areas* (2001), and *Caltrans New Technology Report* (2001).

A Treatment BMP must address runoff from developed areas. Please provide the postconstruction water quality values for the project. Label outfalls on the BMP map. QWQ is dependent on the type of treatment BMP selected for the project.

Outfall	Tributary Area (acres)	Q100 (cfs)	QWQ (cfs)
A	4.79	6.7	1.6
B	5.70	11.4	2.8
C	3.54	5.3	1.3
D	1.3	2.4	.6
E	.64	2.1	.5
F	.64	2.1	.5
G	1.6	2.6	.6

Please check the box(s) that best describes the Treatment BMP(s) selected for this project.

Biofilters

- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins

- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration Basins

- Infiltration basin
- Infiltration trench
- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds or Wetlands

- Wet pond/basin (permanent pool)
- Constructed wetland

Drainage Inserts (See note below)

- Oil/Water separator
- Catch basin insert
- Storm drain inserts
- Catch basin screens

Filtration

- Media filtration
- Sand filtration

Hydrodynamic Separator Systems

- Swirl Concentrator
- Cyclone Separator
- Baffle Separator
- Gross Solids Removal Device
- Linear Radial Device

Note: Catch basin inserts and storm drain inserts are excluded from use on County maintained right-of-way and easements

Include Treatment Datasheet as Attachment E. The datasheet should include the following:	COMPLETED	NO
1. Description of how treatment BMP was designed. Provide a description for each type of treatment BMP.	✓	
2. Engineering calculations for the BMP(s)	✓	

Please describe why the selected treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a detailed explanation and justification.

Grass swales and grass strips should be utilized within project.. Grass strips can easily be added to pad design to cleanse parking area flows prior to draining from pad. Grass lined swales can serve as an effective drainage conveyance system along side parcel map road and draining disturbed pad areas to natural swales.

MAINTENANCE

Please check the box that best describes the maintenance mechanism(s) for this project.

CATEGORY	SELECTED	
	YES	NO
First	✓	
Second		✓
Third		✓
Fourth		✓

Please briefly describe the long-term fiscal resources for the selected maintenance mechanism(s).

Homeowners will provide for maintenance of on-site private improvements within their own parcel. A road association shall be created to maintain road improvements, drainage crossings within the road easements, riprap and grass-lined swales.

ATTACHMENTS

Please include the following attachments.

ATTACHMENT	COMPLETED	N/A
A Project Location Map	✓	
B Site Map	✓	
C Relevant Monitoring Data		✓
D Treatment BMP Location Map	✓	
E Treatment BMP Datasheets	✓	
F Operation and Maintenance Program for Treatment BMPs	✓	
G Engineer's Certification Sheet	✓	

Note: Attachments A and B may be combined.

ATTACHMENT A

LOCATION MAP

Note: see Project Site MAP

ATTACHMENT B

PROJECT SITE MAP

OWNER:
 CROSSROADS INVESTORS I, LLC
 9191 TOWNE CENTER DRIVE, SUITE 600
 SAN DIEGO, CA 92122
 858-597-5971

SURVEYOR:
 JIM EYERMAN, PLS 6336
 1256 EL NIDO DRIVE
 FALLBROOK, CA. 92028
 760-723-2385

ASSESSOR'S PARCEL NO.: 108-161-05 & 06
 SOURCE OF TOPD: AERIAL MAPPING BY INLAND AERIAL INC. ON 2-05-04
 CAL COORD INDEX 442-1713

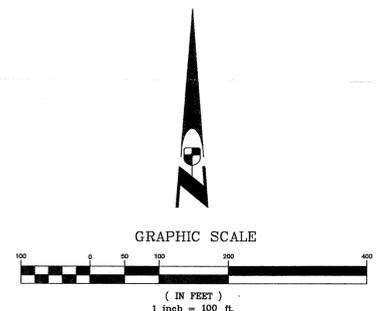
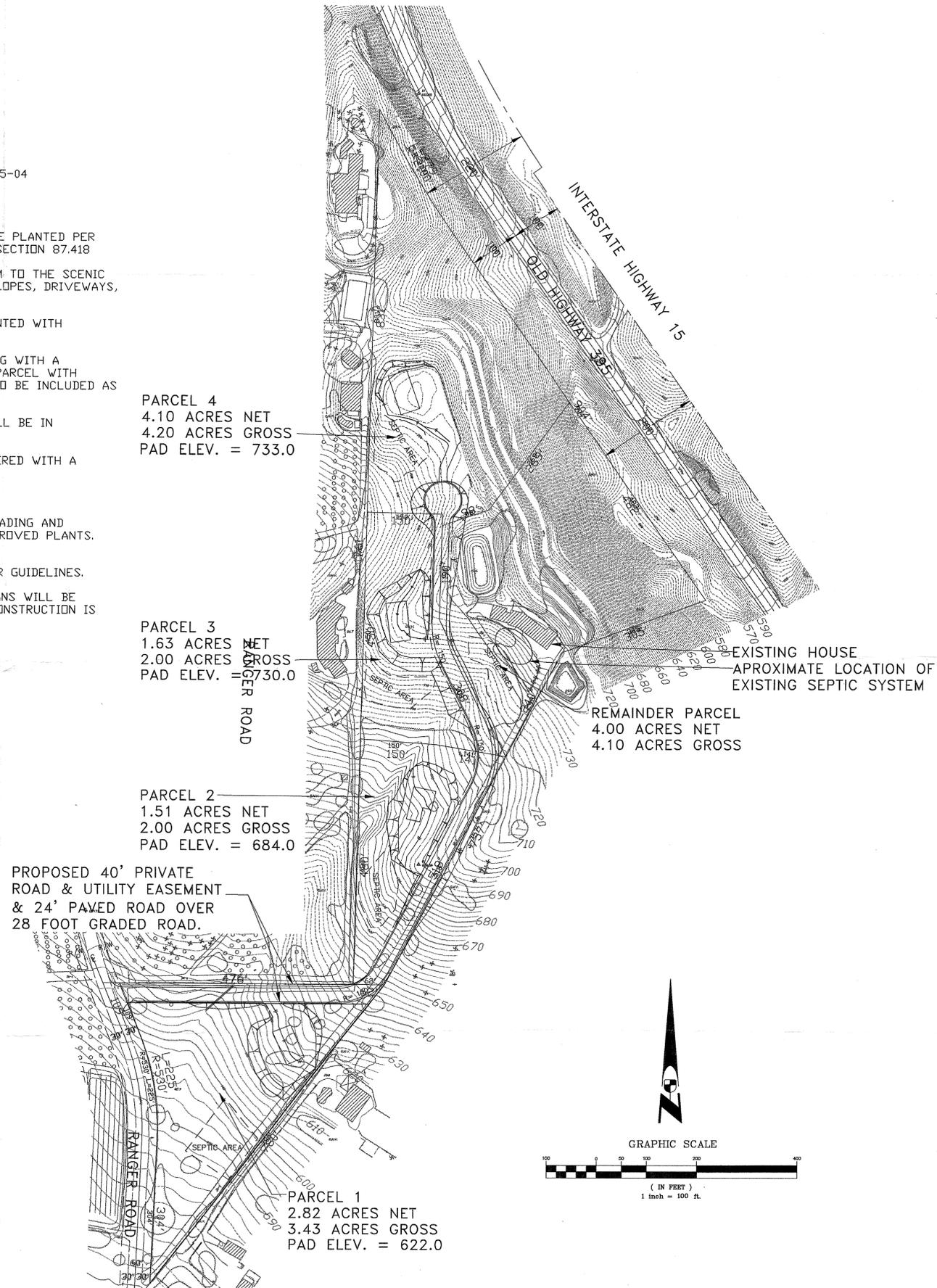
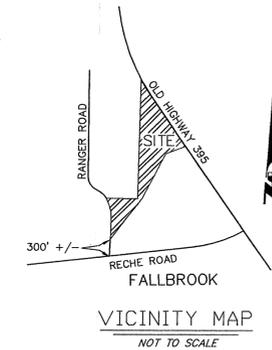
LANDSCAPE NOTES:

1. ALL SLOPES 3 FOOT IN VERTICAL HEIGHT AND ABOVE SHALL BE PLANTED PER SECTION 87.417 OF THE GRADING ORDINANCE AND IRRIGATED PER SECTION 87.418
2. PLANTING ASSOCIATED WITH VISUAL SCREENING SHALL CONFORM TO THE SCENIC PRESERVATION 1-15 CORRIDOR GUIDELINES. VISUAL IMPACTS OF SLOPES, DRIVEWAYS, AND HOUSES SHALL BE ADDRESSED.
3. ALL SLOPES ADJACENT TO AN OPEN SPACE LOT SHALL BE PLANTED WITH NON-INVASIVE PLANTS NATIVE TO THE AREA.
4. A CENTRALLY CONTROLLED AUTOMATIC IRRIGATION SYSTEM ALONG WITH A RAIN-SENSING OVERRIDE DEVICE SHALL BE PROVIDED FOR EACH PARCEL WITH DEVELOPMENT OCCURS. BACKFLOW PREVENTION DEVICE SHALL ALSO BE INCLUDED AS PART OF THE SYSTEM.
5. PLANTING USED FOR BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN CONFORMANCE WITH THE STORMWATER ORDINANCE.
6. ALL PLANTING BEDS AND SLOPES 3:1 AND LESS SHALL BE COVERED WITH A MINIMUM OF 2 INCHES OF ORGANIC MULCH.

NOTES:

1. INDIVIDUAL LANDSCAPE PLANS TO BE COMPLETED PRIOR TO GRADING AND CONSTRUCTION. ALL SLOPES SHALL BE PLANTED WITH COUNTY APPROVED PLANTS. PREFERENCE IS GIVEN TO NATIVE SPECIES.
2. CONSTRUCTION TO BE IN CONFORMANCE WITH THE 1-15 CORRIDOR GUIDELINES.
3. GRADING SHOWN IS CONCEPTUAL ONLY. INDIVIDUAL GRADING PLANS WILL BE PROCESSED WHEN THE SITE SPECIFIC PLANS ARE AVAILABLE. NO CONSTRUCTION IS PROPOSED AT THIS TIME.

**SITE PLAN
 TPM 20800
 RANGER ROAD
 FALLBROOK, CA 92028**



Project Name and Address	
SITE PLAN TPM 20800 RANGER ROAD FALLBROOK 92028	
Project	Sheet
TPM 20800	1 OF 1
Date	
3-14-06	
Scale	
1"=100'	

ATTACHMENT C

RELEVANT MONITORING DATA

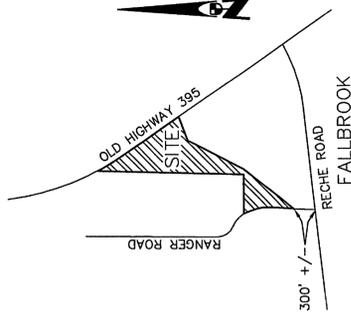
(NOTE: PROVIDE RELEVANT WATER QUALITY MONITORING DATA IF AVAILABLE.)

ATTACHMENT D

TREATMENT BMP LOCATION MAP

PRELIMINARY GRADING PLAN TPM 20800

(REVISED 9/27/2004)
EIR 04-02-002



VICINITY MAP
NOT TO SCALE

OWNER:
CROSSROADS INVESTORS I, LLC
5677 OBERLIN DRIVE SUITE #112
SAN DIEGO, CA 92121
858-597-5960

SURVEYOR/APPLICANT:
JIM EYERMAN, PLS 6336
1256 EL NIDO DRIVE
FALLBROOK, CA. 92028
760-723-2385

ENGINEER:
BRESNAHAN ENGINEERING
3031 RIDGECREEK DRIVE
FALLBROOK, CA. 92028
760-7728-7733

ASSESSOR'S PARCEL NO.: 108-161-05 &
06

SOURCE OF TOPD: AERIAL MAPPING BY
INLAND AERIAL INC ON 2-05-04

CAL COORD INDEX 442-1713

EARTHWORK QUANTITIES

CUT: *10,000 CY
FILL: *10,000 CY
IMPORT: *0
EXPORT: *0

PARCEL 4
4.10 ACRES NET
4.20 ACRES GROSS
PAD ELEV. = 733.0

*ESTIMATE ONLY

NOTE: THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN A VALID GRADING PERMIT BEFORE COMMENCING SUCH ACTIVITY.

PARCEL 3
1.63 ACRES NET
2.00 ACRES GROSS
PAD ELEV. = 730.0

NOTE: ALL CONSTRUCTED SLOPES SHALL CONFORM TO SRD DS-11. FOR SLOPE HEIGHTS UNDER 15', THE TOE OF SLOPE SHALL BE A MINIMUM OF 1.5' FROM THE PROPERTY LINE AND 5' FROM A STRUCTURE. THE TOP OF THE SLOPE SHALL BE A MINIMUM OF 3' FROM THE PROPERTY LINE AND 5 FEET FROM STRUCTURES.

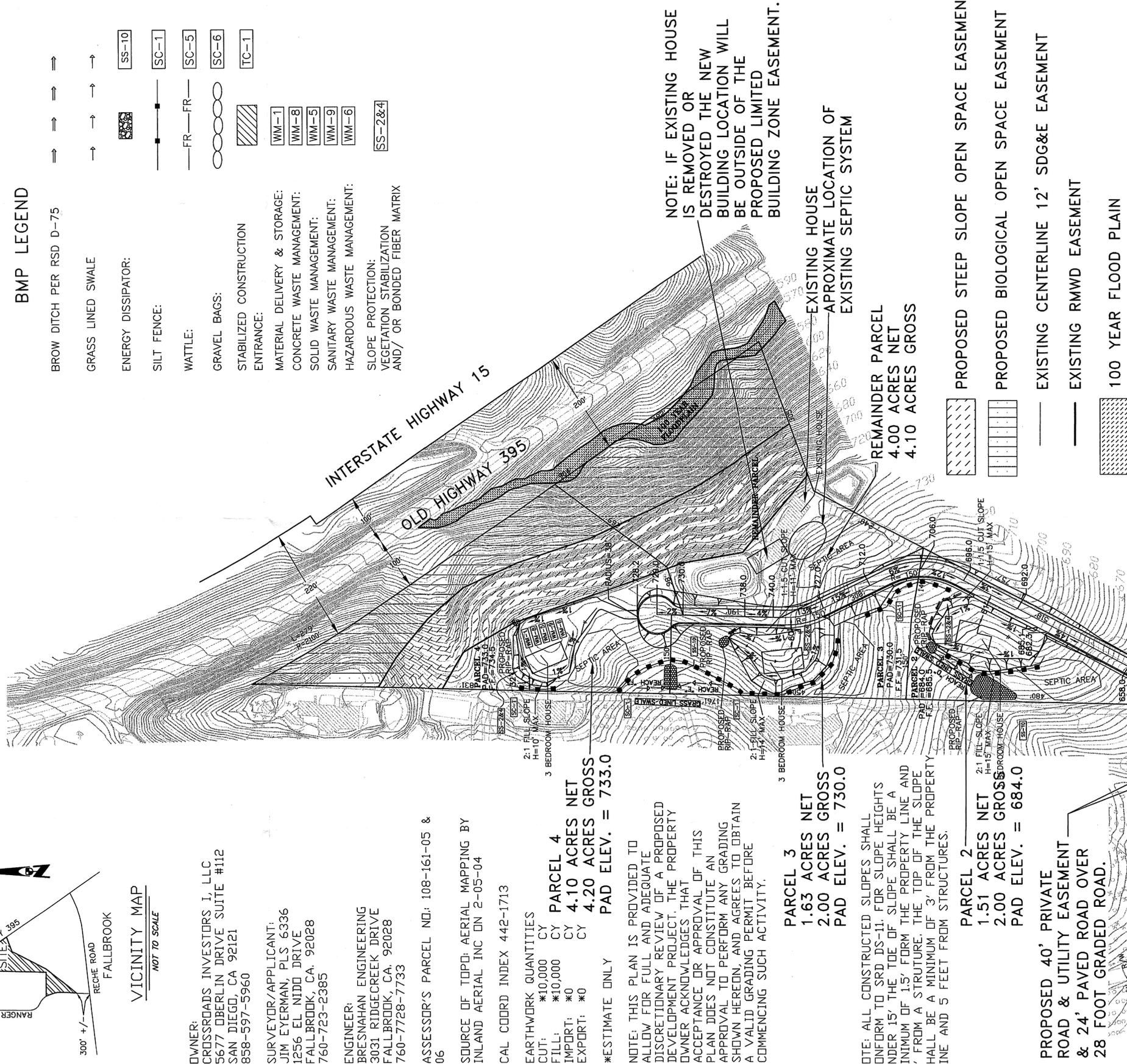
PARCEL 2
1.51 ACRES NET
2.00 ACRES GROSS
PAD ELEV. = 684.0

PROPOSED 40' PRIVATE
ROAD & UTILITY EASEMENT
& 24' PAVED ROAD OVER
28 FOOT GRADED ROAD.

PARCEL 1
2.82 ACRES NET
3.43 ACRES GROSS
PAD ELEV. = 622.0

BMP LEGEND

BROW DITCH PER RSD D-75	→ → → →
GRASS LINED SWALE	→ → → →
ENERGY DISSIPATOR:	SS-10
SILT FENCE:	—■— SC-1
WATTLE:	—FR—FR— SC-5
GRAVEL BAGS:	SC-6
STABILIZED CONSTRUCTION ENTRANCE:	TC-1
MATERIAL DELIVERY & STORAGE:	WM-1
CONCRETE WASTE MANAGEMENT:	WM-8
SOLID WASTE MANAGEMENT:	WM-5
SANITARY WASTE MANAGEMENT:	WM-9
HAZARDOUS WASTE MANAGEMENT:	WM-6
SLOPE PROTECTION: VEGETATION STABILIZATION AND/ OR BONDED FIBER MATRIX	SS-2&4

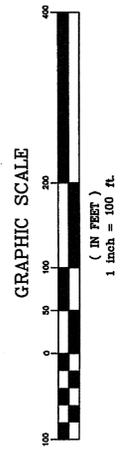


NOTE: IF EXISTING HOUSE IS REMOVED OR DESTROYED THE NEW BUILDING LOCATION WILL BE OUTSIDE OF THE PROPOSED LIMITED BUILDING ZONE EASEMENT.

EXISTING HOUSE
APPROXIMATE LOCATION OF
EXISTING SEPTIC SYSTEM

REMAINDER PARCEL
4.00 ACRES NET
4.10 ACRES GROSS

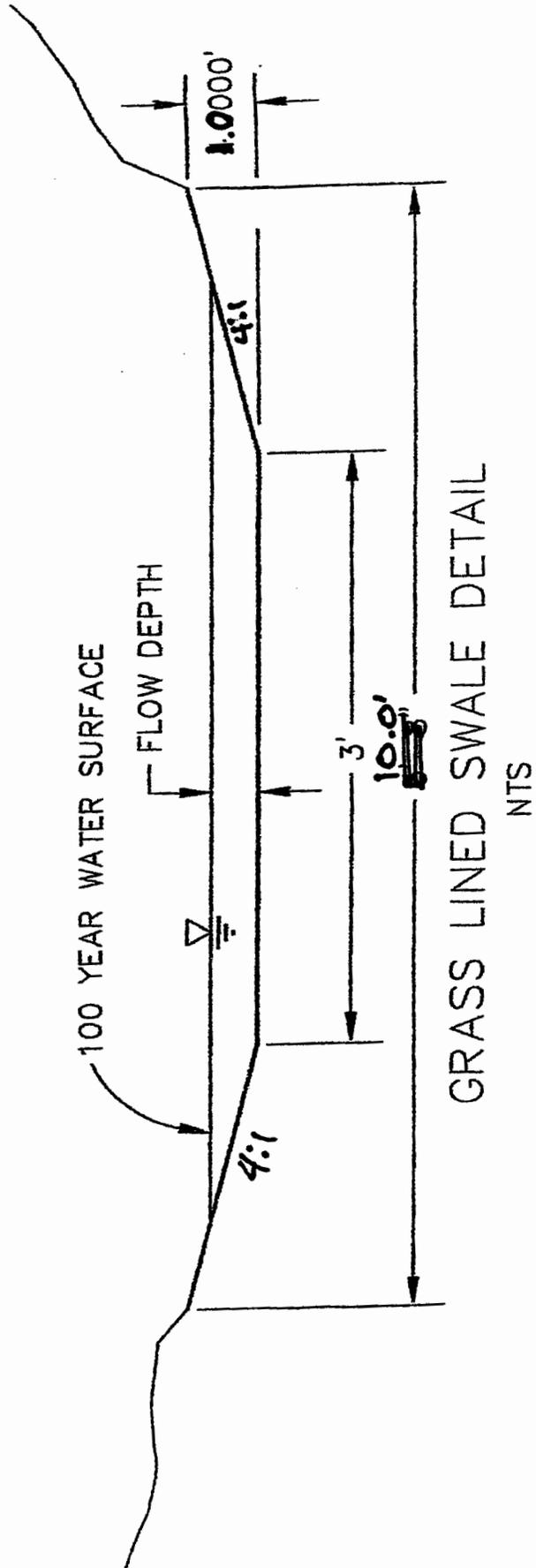
- PROPOSED STEEP SLOPE OPEN SPACE EASEMENT
- PROPOSED BIOLOGICAL OPEN SPACE EASEMENT
- EXISTING CENTERLINE 12' SDG&E EASEMENT
- EXISTING RMWD EASEMENT
- 100 YEAR FLOOD PLAIN



ATTACHMENT E

TREATMENT BMP DATASHEET

MAX. SLOPE = 10%
MIN. SLOPE = 2%



RANGER ROAD
 CROSS ROADS LLC
 FALLBROOK CA

DRAINAGE STUDY

BASIN	Distance (D)	Elev. A	Elev. B	Slope	Tc(min)	AREA (Acre)	C	I(in/hr)	Q100(cfs)	Total Q @ DP	Discharge Point	Iwg(In/hr)	Qwg(cfs)	Total Qwg @ DP	TOTALAREA (AC)
W20	250	740	728.2	4.72	11.7	0.96	0.41	5.3270	2.1	4.2	7	1.3	0.5		
W21	100	728.2	713.9	14.30	5.8	0.80	0.32	8.3939	2.1			2.0	0.5	1.0	1.76
W14	420	604	580	5.71	15.3	1.60	0.36	4.4882	2.6	2.6	4	1.1	0.6	0.6	1.60
W40	300	700	660	13.33	10.3	1.30	0.32	5.8017	2.4		8	1.4	0.6	0.6	1.30
W41	360	660	614	11.79	10.9	3.30	0.4	5.5677	7.3			1.4	1.8		
W42	360	609.7	580	7.82	13.8	1.70	0.32	4.7927	1.7	11.4	10	1.2	0.4	2.8	5.70
W50	800	738	644	11.75	16.8	3.44	0.35	4.2205	5.1			1.0	1.2		
W51	185	644	620	12.97	8.1	0.10	0.32	6.7407	0.2			1.6	0.1		
W52	800	620	571	6.13	21.7	1.25	0.32	3.5773	1.4	6.7	13	0.9	0.3	1.6	4.79

GRASS LINED SWALE ANALYSIS			
REACH	LENGTH(FT)	SWALE TYPE	SLOPE
A	100	SEE DETAIL	2-10%
B	100	SEE DETAIL	2-10%
C	100	SEE DETAIL	2-10%
D	100	SEE DETAIL	2-10%
E	100	SEE DETAIL	2-10%
F	100	SEE DETAIL	2-10%
G	100	SEE DETAIL	2-10%

GRASS SWALE MAX FLOW 2% SLOPE
Channel Calculator

Given Input Data:

Shape Trapezoidal
Solving for Depth of Flow
Flowrate 11.4000 cfs
Slope 0.0200 ft/ft
Manning's n 0.0175
Height 10000.0000 ft
Bottom width 3.0000 ft
Left slope 1.0000 ft/ft (V/H)
Right slope 1.0000 ft/ft (V/H)

Computed Results:

Depth 0.5015 ft
Velocity 6.4915 fps
Full Flowrate 11.4000 cfs
Flow area 1.7561 ft²
Flow perimeter 4.4185 ft
Hydraulic radius 0.3974 ft
Top width 4.0031 ft
Area 1.7561 ft²
Perimeter 4.4185 ft
Percent full 100.0000 %

Critical Information

Critical depth 0.7049 ft
Critical slope 0.0063 ft/ft
Critical velocity 4.3651 fps
Critical area 2.6116 ft²
Critical perimeter 4.9938 ft
Critical hydraulic radius 0.5230 ft
Critical top width 4.4098 ft
Specific energy 1.1564 ft
Minimum energy 1.0574 ft
Froude number 1.7279
Flow condition Supercritical

GRASS SWALE MAX FLOW 10% SLOPE
Channel Calculator

Given Input Data:

Shape Trapezoidal
Solving for Depth of Flow
Flowrate 11.4000 cfs
Slope 0.1000 ft/ft
Manning's n 0.0175
Height 10000.0000 ft
Bottom width 3.0000 ft
Left slope 1.0000 ft/ft (V/H)
Right slope 1.0000 ft/ft (V/H)

Computed Results:

Depth 0.3107 ft
Velocity 11.0834 fps
Full Flowrate 11.4000 cfs
Flow area 1.0286 ft²
Flow perimeter 3.8787 ft
Hydraulic radius 0.2652 ft
Top width 3.6214 ft
Area 1.0286 ft²
Perimeter 3.8787 ft
Percent full 100.0000 %

Critical Information

Critical depth 0.7049 ft
Critical slope 0.0063 ft/ft
Critical velocity 4.3651 fps
Critical area 2.6116 ft²
Critical perimeter 4.9938 ft
Critical hydraulic radius 0.5230 ft
Critical top width 4.4098 ft
Specific energy 2.2197 ft
Minimum energy 1.0574 ft
Froude number 3.6664
Flow condition Supercritical

Treatment BMP Design Guidelines

There are currently seven categories for treatment BMPs. These include biofilters, detention basins, infiltration basins, wet ponds and wetlands, drainage inserts, filtration systems, and hydrodynamic separators. Design guidelines for these categories are described below. The County may update these BMPs as needed.

F.1 Biofilters

Biofiltration swales are vegetated channels that receive directed flow and convey storm water. Biofiltration strips, also known as vegetated buffer strips, are vegetated sections of land over which storm water flows as overland sheet flow. Pollutants are removed by filtration through the grass, sedimentation, adsorption to soil particles, and infiltration through the soil. Swales and strips are mainly effective at removing debris and solid particles, although some dissolved constituents are removed by adsorption onto the soil.

Appropriate Applications and Siting Constraints:

Swales and strips should be considered wherever site conditions and climate allow vegetation to be established and where flow velocities are not high enough to cause scour. Even where strips cannot be sited to accept directed sheet flow, vegetated areas provide treatment of rainfall and reduce the overall impervious surface.

Factors Affecting Preliminary Design:

Interim criteria for the design of swales and strips include the requirements in Sections 3.1, 3.2, and 3.3 of the Guidelines. These sections direct engineers to “maximize vegetation-covered soil areas of a project,” “minimize impervious surfaces” and “minimize overland and concentrated flow depths and velocities.” Designers should also consider the following factors:

Swales have two design goals: 1) maximize treatment, 2) provide adequate hydraulic function for flood routing, adequate drainage and scour prevention. Treatment is maximized by designing the flow of water through the swale to be as shallow and long as site constraints allow. No minimum dimensions are required for treatment purposes, as this could exclude swales from consideration at some sites. Swales should also be sized as a conveyance system calculated according to County procedures for flood routing and scour. To maximize treatment efficiency, strips should be designed to be as long (in the direction of flow) and as flat as the site will allow. No minimum lengths or maximum slopes are required for treatment purposes. The area to be used for the strip should be free of gullies or rills that can concentrate overland flow and cause erosion.

Table 5-4 summarizes preliminary design factors for biofiltration.

Table F.1: Summary Of Bio-filtration Design Factors (Strips And Swales)

Description	Applications/Siting	Preliminary Design Factors
<p>Swales are vegetated channels that receive and convey storm water.</p> <p>Strips are vegetated buffer strips over which storm water flows as sheet flow.</p> <p>Treatment Mechanisms:</p> <ul style="list-style-type: none"> • Filtration through the grass • Sedimentation • Adsorption to soil particles • Infiltration <p>Pollutants removed:</p> <ul style="list-style-type: none"> • Debris and solid particles • Some dissolved constituents 	<ul style="list-style-type: none"> • Site conditions and climate allow vegetation to be established • Flow velocities not high enough to cause scour 	<ul style="list-style-type: none"> • Swales sized as a conveyance system (per County flood routing and scour procedures) • Swale water depth as shallow as the site will permit • Strips sized as long (in direction of flow) and flat as the site allows • Strips should be free of gullies or rills • No minimum dimensions or slope restrictions for treatment purposes • Vegetation mix appropriate for climates and location

ATTACHMENT F

OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMP

*(NOTE: INFORMATION REGARDING OPERATION AND MAINTENANCE CAN BE OBTAINED
FROM THE FOLLOWING WEB SITE:
[HTTP://WWW.SDCOUNTY.CA.GOV/DPW/WATERSHEDS/LAND_DEV/SUSMP.HTML](http://www.sdcounty.ca.gov/dpw/watersheds/land_dev/susmp.html).)*

It is the obligation of the site owner to maintain all structural BMP's that are part of this project. The Structural BMP's proposed in the Storm Water Management Plan for this project are:

Biofilter Strips and Swales.

The maintenance of the proposed structural BMP's is outlined in Appendix H of the County of San Diego's SUSMP as follows:

- Maintain strip/swale vegetation to an average height of six (6) inches and remove any trees or wood vegetation. Twice yearly visual inspections throughout the swale/strip, performed once during the wet season and once during the dry season, shall dictate the need for maintenance. If the average height of vegetation exceeds 12" or trees and woody plants emerge maintenance is required.
- Maintain adequate vegetation cover of the strip/swale vegetation to 90% within the invert/flow line of swale and 70% on the sidewalls of the swale. Twice yearly visual inspections throughout the swale/strip, performed once during the late wet season (May) and once during the late dry season, shall dictate the need for maintenance. Prepare a site schematic and indicating barren or browning spots. Scarify areas to be restored to a depth of two (2) inches and reseed by November of each year. Retain site schematic for assessment of permanent problems.
- Visually inspect swales/strips yearly for debris and sediment accumulation. Remove debris and discard with household green waste or trash as appropriate. If sediment becomes deep enough to change flow gradient of swale/strip, remove sediment during dry season and revegetate. Discard sediment to appropriate location where further erosive action cannot take place. Regarding and redesign of bioswale/strip may be necessary. Small amounts (fifty cubic yards) of sediment may be spread level on site at depths not to exceed twelve (12) inches and seeded. Check with county for requirements of significant sediment removal. Determine cause of sediment deposits and take corrective actions as necessary.
- Inspect and remove animal burrows annually and after vegetation trimming. Backfill firmly if burrows cause erosion or seepage.
- Provide semi-annual visual inspection for general maintenance of inlet structures, outlet structures and riprap. Remove trees and woody vegetation as required.

Based on the figures provided in Appendix H, the annual cost of maintenance for this projects structural BMP's may vary from \$0 to \$2980. Unforeseen events may increase this number substantially.

The Owner of the project shall provide a signed/notarized statement to the county acknowledging responsibility for the afore-mentioned structural BMP's maintenance, repair, and replacement until the County accepts an alternative mechanism to ensure such activities. Furthermore the statement will assign responsibility to any subsequent owners of the subject property. Said statement will be required to be recorded with the County of San Diego's Records Office.

APPENDIX H Estimated O & M Costs for BMP Project

Estimated values derived from Caltrans Pilot BMP Study. This spreadsheet will change as additional data becomes available.																
ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITES-SPECIFIC REQUIREMENTS	Per. Hrs	Labor Rate	Cost	Type	Equipment Days	rate	Cost	Item	Materials Cost	Total Cost	Comments
BIOFILTER - STRIPS and SWALES Preventive Maintenance and Routine Inspections	Average vegetation height exceeds 12 inches, emergence of trees, or woody vegetation	Visual inspection of vegetation throughout strip/swale	Once during wet season, once during dry season, (depending on growth)	Cut vegetation to an average height of 6 inches	Remove any trees, or woody vegetation.	10	43.83	438.3	one-ton truck & hydroseeder	2	28.84	58.08	airing trimmer, rake, fork, brig. safety equipment	50	539.98	
Assess adequate vegetative cover	Less than 80 percent coverage in strip invertebrate or less than 70 percent on swale side slope	Visual inspection of strip/swale. Prepare a record schematic to record location and distribution of barren or browning spots to be restored. File the schematic for assessment of persistent problems.	Assess quantity needed in May each year late wet season and late dry season.	Reseed/vegetate barren spots by Nov.		8	43.83	349.04	one-ton truck & hydroseeder	1	48.15	48.15	seed	150	547.18	
Inspect for debris accumulation	Debris or litter present	Visual observation	During routine trashing, per Districts schedule.	Remove litter, and debris.	None	0	43.83	0	one-ton truck & hydroseeder	0	26.84	0	blanket	0	0	
Inspect for accumulated sediment	Sediment at or near vegetation height, channeling of flow, inhibited flow due to change in slope.	Visual observation	Annually	Remove sediment. If flow is channelled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment during dry season, characterize and properly dispose of sediment, and regrade.		16	43.83	698.08	one-ton truck & hydroseeder	1	48.15	48.15	seed, testing and disposal of sediment	300	1046.23	once every three years

APPENDIX H Estimated O & M Costs for BMP Project

Estimated values derived from Caltrans Pilot BMP Study. This spreadsheet will change as additional data becomes available.

	Per. Hrs	Labor Rate	Cost	Type	Equipment		Materials Item	Cost	Total Cost	Comments
					Days	rate				
Inspect for burrows	2	43.63	87.26					0	87.26	
	0	0	0	one-ton truck & hydroseder	0	26.64		0	0	
General Maintenance Inspection	16	43.63	698.08	one-ton truck & hydroseder	2	26.64		69.68	751.76	
TOTAL BIO FILTER AND SHALES	82		2265.76					203.66	600	2872.42

Notify engineer to determine if grading is necessary. If necessary, regrade to design specification and revegetate watershed. If grading is necessary, the process should start in May. Revegetate strip/areas in Nov. Target completion prior to wet season.

None

Where burrows cause seepage, erosion and leakage, backfill firmly.

Annually and after vegetation trimming.

Visual observation

Burrows, holes, mounds

Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees, woody vegetation, fence damage, etc.

Corrective action prior to wet season. Consult engineer if an immediate solution is not evident.

Semi-Annually, late wet season and late dry season.

Visual observation

Remove any trees, or woody vegetation.

ATTACHMENT G

CERTIFICATION SHEET

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.



KEVIN PATRICK BRESNAHAN
REGISTERED CIVIL ENGINEER. C 59954



DATE

