County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

RESQUE RANCH
PDS2016-LDGRMJ-30067

North of Highland Valley Road, Escondido, CA 92025

ASSESSOR'S PARCEL NUMBER(S):
276-030-48 & 49

ENGINEER OF WORK:

Danny Abada, P.E. RCE: 45381

PREPARED FOR:

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PDP SWQMP PREPARED BY:

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475 Production Street
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Phone: (760) 736-2040

DATE OF SWQMP:
4/6/18

PLANS PREPARED BY:
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Phone: (760) 736-2040

SWQMP APPROVED BY:

APPROVAL DATE:

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Table of Contents

Attachments

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: RESQUE RANCH
Permit Application Number: PDS2016-LDGRMJ-30067

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

RCE 45381, Expiration Date 9/30/18

Danny Abada, P.E.
Print Name

SPEAR & ASSOCIATES, INC.
Company

4/6/18
Date

Engineer's Seal:

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Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Final Design

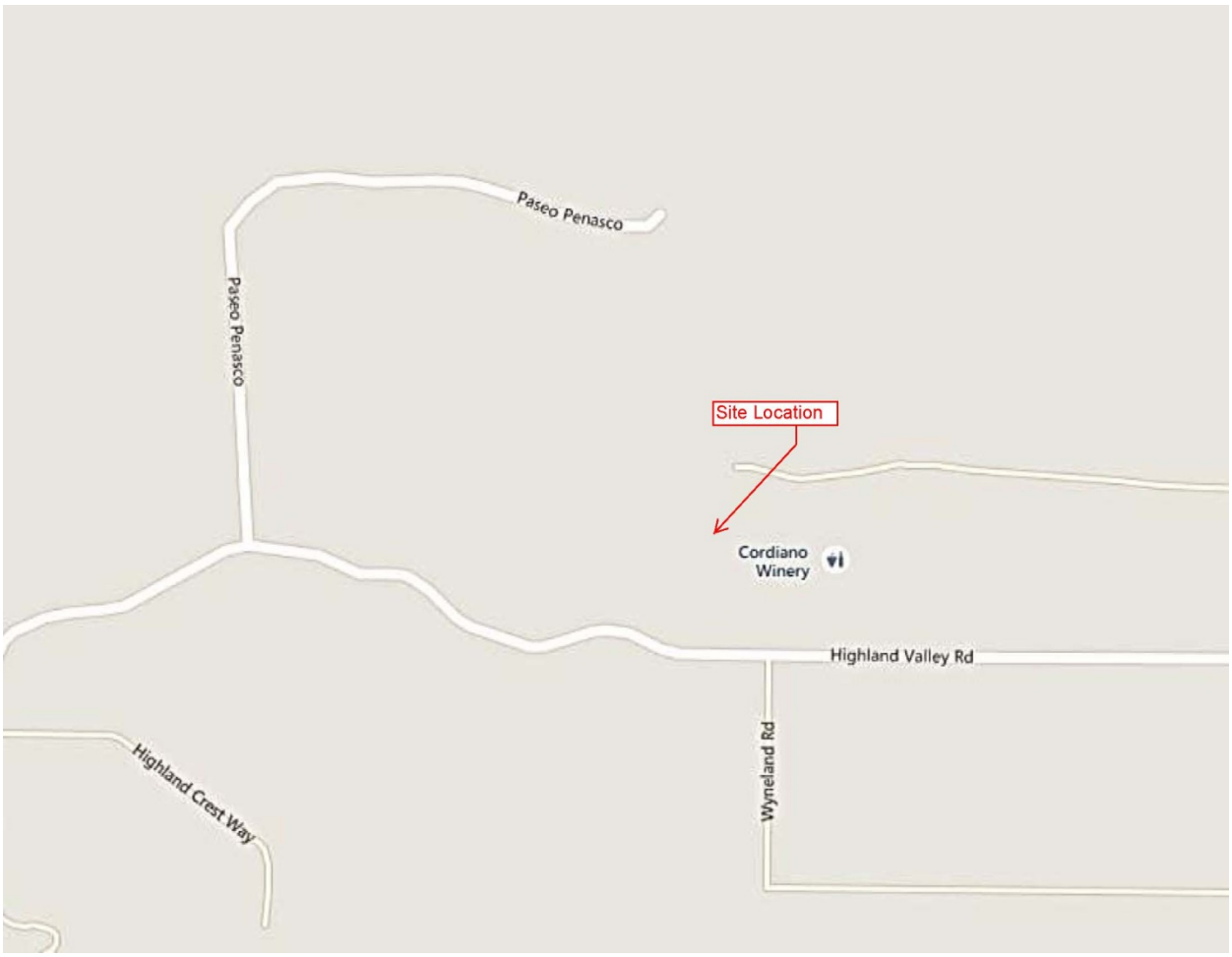
Submittal Number	Date	Summary of Changes
1	2/20/17	Initial Submittal
2	5/2/17	
3	4/6/18	
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Project Vicinity Map

Project Name: RESQUE RANCH
Record ID: PDS2016-LDGRMJ-30067



Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? (☐ Yes ☒ No If so, a PDP SWQMP is required. Go to Step 2.			
The project is (select one): ☒ New Development ☐ Redevelopment[1]			
The total proposed newly created or replaced impervious area is: 30,503 ft^2			
The total existing (pre-project) impervious area is: 0 ft^2			
The total area disturbed by the project is: 223,264 ft^2			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: ___			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

[2] Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

[3] For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is: 0 ft^2 (A)

The total proposed newly created or replaced impervious area is 30,503 ft^2 (B)

Percent impervious surface created or replaced (B/A)*100: 100 %

The percent impervious surface created or replaced is (select one based on the above calculation):

☐ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☒ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following: ☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;	If so: Standard Project requirements apply, AND any additional requirements specific to the type of project. County concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP**
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.	**Complete Green Streets PDP Exempt SWQMP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☒Yes	☐No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☐	Erosion Control Plans
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☐	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☐	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☒	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☐	Erosion Control Plans
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☒	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☐	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☐	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☒	Erosion Control Plans
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	Erosion Control Plans
Fiber Rolls (Straw Wattles)	SC-5	☒	
Gravel & Sand Bags	SC-6 & 8	☒	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☒	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☐	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	Erosion Control Plans
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☐	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☐	
Street Sweeping and Vacuuming	SC-7	☐	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	
Spill Prevention and Control	WM-4	☐	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	Erosion Control Plans
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☐	

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

[9] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

[10] Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

County of San Diego PDP SWQMP Site Information Checklist

Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	San Dieguito HU, Highland HSU 905.31

Current Status of the Site (select all that apply):
- ☐ Existing development
- ☒ Previously graded but not built out
- ☐ Demolition completed without new construction
- ☒ Agricultural or other non-impervious use
- ☒ Vacant, undeveloped/natural

Description / Additional Information:

Existing Land Cover Includes (select all that apply and provide each area on site):
- ☐ Vegetative Cover _____ Acres (_____ Square Feet)
- ☒ Non-Vegetated Pervious Areas 5.13 Acres (223,264 Square Feet)
- ☐ Impervious Areas _____ Acres (_____ Square Feet)

Description / Additional Information:

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
- ☐ NRCS Type A
- ☒ NRCS Type B
- ☒ NRCS Type C
- ☒ NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used):
- ☐ GW Depth < 5 feet
- ☐ 5 feet < GW Depth < 10 feet
- ☒ 10 feet < GW Depth < 20 feet
- ☐ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):
- ☒ Watercourses
- ☐ Seeps
- ☐ Springs
- ☐ Wetlands
- ☐ None
- ☐ Other

Description / Additional Information:

Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

Existing drainage is natural, which includes 2 offsite drainage areas of approximately 3.5 and 12.9 acres, being conveyed through the site towards the northwest corner. There is an existing buried and abandoned 18" CMP on the west boundary of the site

The site drainage sheet flows in a northwesterly direction, continuing approximately 0.5 miles north towards the San Dieguito River, then 5 miles through Lake Hodges, and 18 miles west to the Pacific Ocean.

(Please refer to Hydrology Report For Detailed Information)

100-yr Hydrology Results Summary

	P_6	C	I	Area (acres)	TC	Q (cfs)	Outlet V (ft/s)
Pre-Dev. Onsite	2.88	0.3	5.52	5.13	8.2	8.5	
Post-Dev. Onsite	2.88	0.38	3.35	5.13	17.8	6.5	
Pre Dev Total Onsite & Offsite @ NW Confluence	2.88	0.25 & 0.3 & 0.33	5.05	21.71	9.4	28.7	6.7
Post Dev Total Onsite & Offsite @ NW Confluence	2.88	0.25 & 0.32 & 0.38 & 0.82	3.61	21.71	15.8	22.2	6.4
Pre & Post Dev Offsite C1 to Exist/Extended 30" CMP	2.88	0.33	6.11	3.5	7	7.1	9.3

Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

Existing & Proposed Zoning & Use: Agricultural, Proposed Use: Commercial, Animal Rescue Facility

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

Impervious Development will include a horse stable with a driveway and other hardscape surface.

List/describe proposed pervious features of the project (e.g., landscape areas):

Proposed pervious surfaces include landscaping and bioretention/biofiltration for stormwater treatment.

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:

Only minor grading is proposed to accommodate the development.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation			
Pervious (non-vegetated)	5.13 acres	4.43 acres	86.4%
Impervious	0 acres	0.7 acres	13.7%

Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes

☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

The development will maintain existing drainage patterns and will include channel improvements and biofiltration/bioretention basins (BF-1) & (BF-2 with nutrient sensitive media) for stormwater treatment.

(Please refer to Hydrology Report For Detailed Information)

100-yr Hydrology Results Summary

	P_6	*C*	I	*Area (acres)*	*TC*	*Q (cfs)*	*Outlet V (ft/s)*
Pre-Dev. Onsite	2.88	0.3	5.52	5.13	8.2	8.5	
Post-Dev. Onsite	2.88	0.38	3.35	5.13	17.8	6.5	
Pre Dev Total Onsite & Offsite @ NW Confluence	2.88	0.25 & 0.3 & 0.33	5.05	21.71	9.4	28.7	6.7
Post Dev Total Onsite & Offsite @ NW Confluence	2.88	0.25 & 0.32 & 0.38 & 0.82	3.61	21.71	15.8	22.2	6.4
Pre & Post Dev Offsite C1 to Exist/Extended 30" CMP	2.88	0.33	6.11	3.5	7	7.1	9.3

Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

- ☒ On-site storm drain inlets
- ☐ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☐ Need for future indoor & structural pest control
- ☒ Landscape/Outdoor Pesticide Use
- ☒ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☒ Refuse areas
- ☐ Industrial processes
- ☐ Outdoor storage of equipment or materials
- ☐ Vehicle and Equipment Cleaning
- ☐ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☐ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☒ Other (Animal Facilities)

Description / Additional Information:

Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

The site drainage sheet flows in a northwesterly direction, continuing approximately 0.5 miles north towards the San Dieguito River, then 5 miles through Lake Hodges, and 18 miles west to the Pacific Ocean.

List any 303(d) impaired water bodies[11] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Lake Hodges	Color, Manganese, Mercury, Nitrogen, Phosphorus, Turbidity, pH. Nitrogen, Phosphorus, Turbidity, pH.	
San Dieguito River, Pacific Ocean	Enterococcus, Fecal Coliform, Nitrogen, Phosphorus, Total Dissolved Solids, Toxicity, Total Coliform	*Indicator Bacteria*
Pacific Ocean Shoreline @ San Dieguito River mouth	Total Coliform	

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[12] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact.

☐ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*.

- ☒ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,
- ☐ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

☐ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3).

- ☐ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,
- ☐ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).*

☒ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs.

- ☒ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☐ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☒ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☐ Project has provided alternate mapping of CCSYAs. ☐ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. POC 1 @ NW corner
Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:* *Discussion / Additional Information: (optional)*

Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.

Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.3 not implemented: not proposed			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.4 not implemented: not proposed			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.5 not implemented: No outdoor trash area is proposed			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☒ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☒ F. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☒ H. Refuse areas	☒Yes	☐No	☐N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☐ O. Fire sprinkler test water	☐Yes	☐No	☒N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above. Animal Facilities are also a potential source from the proposed Stable N/A are not proposed			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented: Onsite Drainage patterns are significantly conserved. The existing channel running along the southerly boundary will be modified with a newly engineered section.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented: *Eucalyptus trees along Main Street will be preserved.*			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.5 not implemented: Dispersion was unfeasible due a distant location of impervious areas from landscaping.			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.6 not implemented: Not feasible due to lack of space and low demand of the proposed drought tolerant vegetation.			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.8 not implemented: Not feasible due to lack of space and low demand of the proposed drought tolerant vegetation.			

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the County at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the County must confirm the maintenance (see Section 7 of the BMP Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.

Biofiltration basins (BF-1) & (BF-2 with nutrient sensitive media) was selected as the most efficient BMP to treat the project's anticipated and expected pollutants. Biofiltration basins is used for treatment and hydromodification.

Runoff factors were adjusted to account for the site design BMPs and the DCV was calculated.

Harvest and use of stormwater within the project was found unfeasible because there will be no significant demand with the proposed drought tolerant landscaping and development type.

Infiltration is feasible for full capture condition for Basin O and partial infiltration for Basin B according to geotech form I-8.

Basins B & O were designed and sized in accordance with design criteria and considerations listed in the BMP design manual fact sheets. DMAs A, C and D are self-mitigating.

Description of structural BMP strategy continued
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from previous page)

Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. Basin B	
Construction Plan Sheet No. 2	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☒ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	SPEAR & ASSOCIATES, INC. c/o Josh Ziegler, P.E. 475 Production Street, San Marcos, CA 92078 Phone: (760) 736-2040
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 1
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. Basin O	
Construction Plan Sheet No. 2	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☒ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	SPEAR & ASSOCIATES, INC. c/o Josh Ziegler, P.E. 475 Production Street, San Marcos, CA 92078 Phone: (760) 736-2040
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	Category 1
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☒ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☒ Included

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☐ Underlying hydrologic soil group
☐ Approximate depth to groundwater
☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☐ Critical coarse sediment yield areas to be protected
☐ Existing topography and impervious areas
☐ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed demolition
☐ Proposed grading
☐ Proposed impervious features
☐ Proposed design features and surface treatments used to minimize imperviousness
☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☐ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	2,671	cubic-feet
	1	Proposed Development Type	Industrial	unitless
	2	Number of Residents or Employees at Proposed Development	2	#
	3	Total Planted Area within Development	192,761	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	No	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.10	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	2	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	231	cubic-feet
	13	Total Anticipated Use Over 36 Hours	233	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.09	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	Yes	yes/no
Result	18	Feasibility Category	4	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	Basin B	Basin O									unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Retention									unitless
	2	85th Percentile 24-hr Storm Depth	0.67	0.67									inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.103	0.738									in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	28,660	7,188									sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)											sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)											sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)											sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	64,491	1,846									sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	93,151	9,034	0	0	0	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.44	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.44	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	2,288	383	0	0	0	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.44	0.76	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	2,288	383	0	0	0	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.44	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	40,986	6,866	0	0	0	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	2,288	383	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.4-1: Sizing Retention BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	-	Basin O	-	-	-	-	-	-	-	-	unitless
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	-	0.738	-	-	-	-	-	-	-	-	in/hr
	2	Design Capture Volume Tributary to BMP	-	383	-	-	-	-	-	-	-	-	cubic-feet
	3	Is Retention BMP Vegetated or Non-Vegetated?		Vegetated									unitless
	4	Provided Surface Area		244									sq-ft
	5	Provided Surface Ponding Depth		6									inches
	6	Provided Soil Media Thickness		18									inches
	7	Provided Gravel Storage Thickness		18									inches
Infiltration Calculations	8	Volume Infiltrated Over 6 Hour Storm	0	90	0	0	0	0	0	0	0	0	cubic-feet
	9	Soil Media Pore Space	0.40	0.25	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	10	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	11	Effective Depth of Retention Storage	0.0	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	inches
	12	Drawdown Time for Surface Ponding (Post-Storm)	0	8	0	0	0	0	0	0	0	0	hours
	13	Drawdown Time for Entire Basin (Including 6 Hour Storm)	0	30	0	0	0	0	0	0	0	0	hours
	14	Volume Retained by BMP	0	449	0	0	0	0	0	0	0	0	cubic-feet
	15	Fraction of DCV Retained	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	16	Percentage of Performance Requirement Satisfied	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	17	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	18	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
Result	19	**Deficit of Effectively Treated Stormwater**	**n/a**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.4-1 General Notes:

A. Applicants may use this worksheet to size Infiltration, Bioretention, and/or Permeable Pavement BMPs (INF-1, INF-2, INF-3) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
BMP Inputs	0	Drainage Basin ID or Name	Basin B	-	-	-	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.103	-	-	-	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	40,986	-	-	-	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	-	-	-	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	2,288	-	-	-	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Unlined										unitless
	6	Provided Biofiltration BMP Surface Area	4,004										sq-ft
	7	Provided Surface Ponding Depth	12										inches
	8	Provided Soil Media Thickness	18										inches
	9	Provided Depth of Gravel Above Underdrain Invert	13.5										inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.63										inches
	11	Provided Depth of Gravel Below the Underdrain	7.5										inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	206	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	35	0	0	0	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	1,508	0	0	0	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	755	0	0	0	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.1308	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.41	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	1.41	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	8.47	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	21.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	8	0	0	0	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	14	0	0	0	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	29.47	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	1,133	0	0	0	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	1,133	0	0	0	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	566	0	0	0	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	566	0	0	0	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	-	-	-	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	*ii*	*iii*	*iv*	*v*	*vi*	*vii*	*viii*	*ix*	*x*	Units
General Info	0	Drainage Basin ID or Name	Basin B	Basin O	-	-	-	-	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.67	0.67	-	-	-	-	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.103	0.738	-	-	-	-	-	-	-	-	in/hr
	3	Total Tributary Area	93,151	9,034	-	-	-	-	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	5,201	504	-	-	-	-	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.44	0.76	-	-	-	-	-	-	-	-	unitless
	6	Initial Design Capture Volume	2,288	383	-	-	-	-	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	-	-	-	-	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	-	-	-	-	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	40,986	6,866	-	-	-	-	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	2,288	383	-	-	-	-	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Retention	-	-	-	-	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	1,533	383	-	-	-	-	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.67	1.00	-	-	-	-	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	65.5%	80.4%	-	-	-	-	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	16.6%	80.0%	-	-	-	-	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	-	-	-	-	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	-	-	-	-	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	-	-	-	-	-	-	-	-	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the SWQMP submittal package.

False

E.1 Source Control BMP Requirements

Worksheet E.1-1: Source Control BMP Requirements

How to comply: Projects must comply with this requirement by implementing all source control BMPs listed in this section that are applicable and feasible for their project. Applicability must be determined through consideration of the development project's features and anticipated pollutant sources. Appendix E.1 provides guidance for identifying source control BMPs applicable to a project. The Standard and PDP SWQMP templates include sections that must be used to document compliance with source control BMP requirements.

How to use this worksheet:

1. Review Column 1 and identify which of these potential sources of storm water pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your project site plan.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your project-specific storm water management report. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

If These Sources Will Be on the Project Site …	… Then Your SWQMP Must Consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
☒ **A.** Onsite storm drain inlets ☐ Not Applicable	☒ Locations of inlets.	☒ Mark all inlets with the words "No Dumping! Flows to Bay" or similar. See stencil template provided in Appendix I-4	☒ Maintain and periodically repaint or replace inlet markings. ☒ Provide storm water pollution prevention information to new site owners, lessees, or operators. ☒ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook. ☒ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **B.** Interior floor drains and elevator shaft sump pumps ☒ Not Applicable		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages ☒ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D1.** Need for future indoor & structural pest control ☒ Not Applicable		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
☒ **D2.** Landscape/ Outdoor Pesticide Use ☐ Not Applicable	☒ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☒ Show storm water treatment facilities.	State that final landscape plans will accomplish all of the following. ☒ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. ☐ Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. ☐ Consider using pest-resistant plants, especially adjacent to hardscape. ☒ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☒ Maintain landscaping using minimum or no pesticides. ☐ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook. ☐ Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **E.** Pools, spas, ponds, decorative fountains, and other water features. ☐ Not Applicable	☒ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	☒ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☒ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook.
☐ **F.** Food service ☒ Not Applicable	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **G.** Refuse areas ☐ Not Applicable	☒ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☒ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. ☒ Any drains from dumpsters, compactors, and tallow bin areas must be connected to a grease removal device before discharge to sanitary sewer.	☒ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☒ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☒ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on- site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative Table and Narrative**
❑ **H.** Industrial processes. ☒ Not Applicable	❑ Show process area.	❑ If industrial processes are to be located onsite, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Storm Water Discharges" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks.
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ☒ Not Applicable	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. ❑ Storage of non-hazardous liquids must be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **J.** Vehicle and Equipment Cleaning ☒ Not Applicable	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs must either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes must have a paved, bermed, and covered car wash area (unless car washing is prohibited onsite and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment must be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities must be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility must discharge to the sanitary sewer, or a wastewater reclamation system must be installed.	❑ If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations must not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in Table and Narrative**	**4** **Operational BMPs—Include in Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance ☒ Not Applicable	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains must not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the report, note that all of the following restrictions apply to use the site: ❑ No person must dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal must be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids must be contained or drained from the vehicle immediately. ❑ No person must leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **L.** Fuel Dispensing Areas ☒ Not Applicable	❑ Fueling areas[16] must have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of storm water to the MEP. ❑ Fueling areas must be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] must not drain onto the fueling area.		❑ The property owner must dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Storm Water Quality Handbooks at https://www.casqa.org/resources/bmp-handbooks.

[16] The fueling area must be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on Drawings**	**3** **Permanent Controls—List in**	**4** **Operational BMPs—Include in Table and Narrative**
M. Loading Docks ☒ Not Applicable	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks must be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts must be positioned to direct storm water away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer must be equipped with a spill control valve or equivalent device, which must be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook.

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
❑ **N.** Fire Sprinkler Test Water ☒ Not Applicable		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Storm Water Quality Handbooks at www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook
O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim ☒ Not Applicable		❑ Boiler drain lines must be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop mounted equipment with potential to produce pollutants must be roofed and/or have secondary containment. ❑ Any drainage sumps onsite must feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

If These Sources Will Be on the Project Site …	… Then Your SWQMP must consider These Source Control BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Drawings**	3 **Permanent Controls—List in Table and Narrative**	4 **Operational BMPs—Include in Table and Narrative**
☒ **P.** Plazas, sidewalks, and parking lots. ☐ Not Applicable			☒ Plazas, sidewalks, and parking lots must be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing must be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser must be collected and discharged to the sanitary sewer and not discharged to a storm drain.

BIOINFILTRATION BASIN B

Worksheet I-8 : Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet I-8	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: Basin B: On site percolation tests resulting in calculated infiltration rate to include safety factor were less than 0.5 inches/hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Excavations for trenches and foundations placed on the site building pad within 100 feet of Basin B should not be deeper than the bottom of the liner. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Review of Geotracker, an on line resource for known contaminated properties undergoing regulatory review, indicates the site and up surface gradient properties are not under regulatory review for a release of contaminants. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Ephemeral or blue line streams or other drainages and water bodies do not cross the site or adjacent properties so as to be impacted by on site infiltration of storm water. The site is not contaminated so as to contribute to contamination of groundwater or surface water. Private septic systems should be no closer to Basin B than allowed by the County of San Diego Department of Environmental Health. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		No Full

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet I-8 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: On site percolation tests results allow a calculated infiltration rate of 0.10256 inches/hour to include as safety factor of 2 as per attached D.5-1. It is noted that the term "appreciable" is subject to regulatory interpretation. CTE presents the calculated infiltration rate as "appreciable" simply as there was a measurable water column drop sufficient to allow an infiltration rate calculation. See attached report for percolation test results and infiltration rate calculation. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
Provide basis: The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Soil Boring B-3 was placed within 50 feet of Basin B extended at least 10 feet below the basin filter medium did not encounter groundwater. The underlying Woodson Mountain granodiorite is a crystalline bedrock and accordingly is not considered a regional water bearing body. As such, infiltrate from Basin B is not anticipated to impact groundwater. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: CTE is unaware of water rights to be impacted by the proposed Basin B. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		Partial

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.00
Combined Safety Factor, $S_{total} = S_A \times S_B$				1.0 as modified below	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.20513 in/hr	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.10256 in/hr	
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Basin B: Minimum safety factor of 2 is assigned as per County (February 2016) guidelines. See attached report for percolation test results, calculated infiltration rates and conclusions.					

BIOINFILTRATION BASIN O

Worksheet I-8 : Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet I-8	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: Basin B: On site percolation tests resulting in calculated infiltration rate to include safety factor were less than 0.5 inches/hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Excavations for trenches and foundations placed on the site building pad within 100 feet of Basin B should not be deeper than the bottom of the liner. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Review of Geotracker, an on line resource for known contaminated properties undergoing regulatory review, indicates the site and up surface gradient properties are not under regulatory review for a release of contaminants. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Ephemeral or blue line streams or other drainages and water bodies do not cross the site or adjacent properties so as to be impacted by on site infiltration of storm water. The site is not contaminated so as to contribute to contamination of groundwater or surface water. Private septic systems should be no closer to Basin B than allowed by the County of San Diego Department of Environmental Health. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		No Full

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet I-8 Page 3 of 4			
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Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: On site percolation tests results allow a calculated infiltration rate of 0.10256 inches/hour to include as safety factor of 2 as per attached D.5-1. It is noted that the term "appreciable" is subject to regulatory interpretation. CTE presents the calculated infiltration rate as "appreciable" simply as there was a measurable water column drop sufficient to allow an infiltration rate calculation. See attached report for percolation test results and infiltration rate calculation. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
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Provide basis: The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Soil Boring B-3 was placed within 50 feet of Basin B extended at least 10 feet below the basin filter medium did not encounter groundwater. The underlying Woodson Mountain granodiorite is a crystalline bedrock and accordingly is not considered a regional water bearing body. As such, infiltrate from Basin B is not anticipated to impact groundwater. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: CTE is unaware of water rights to be impacted by the proposed Basin B. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		Partial

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.00
Combined Safety Factor, $S_{total} = S_A \times S_B$				1.0 as modified below	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.20513 in/hr	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.10256 in/hr	
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Basin B: Minimum safety factor of 2 is assigned as per County (February 2016) guidelines. See attached report for percolation test results, calculated infiltration rates and conclusions.					

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

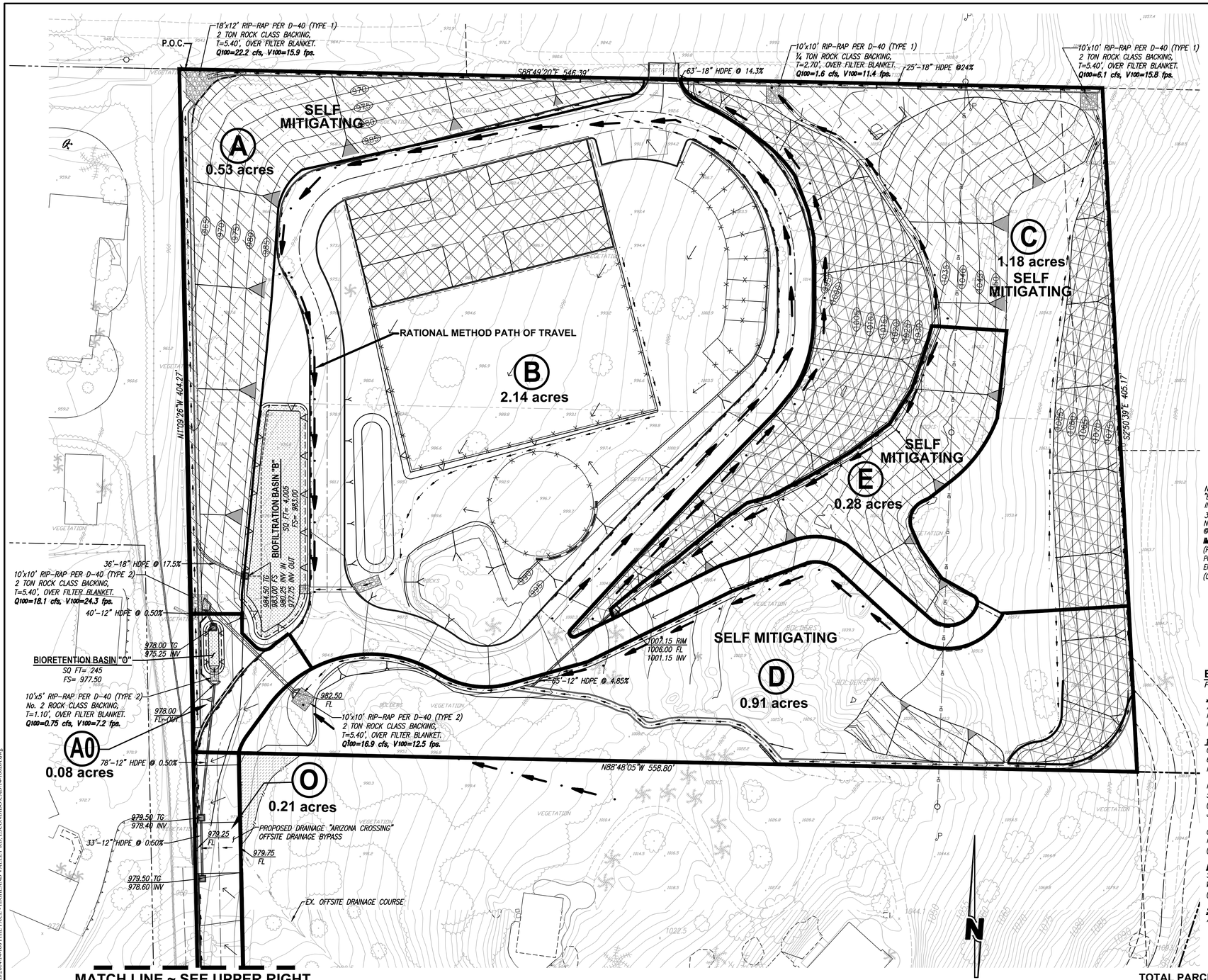
Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☒ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☐ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☒ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

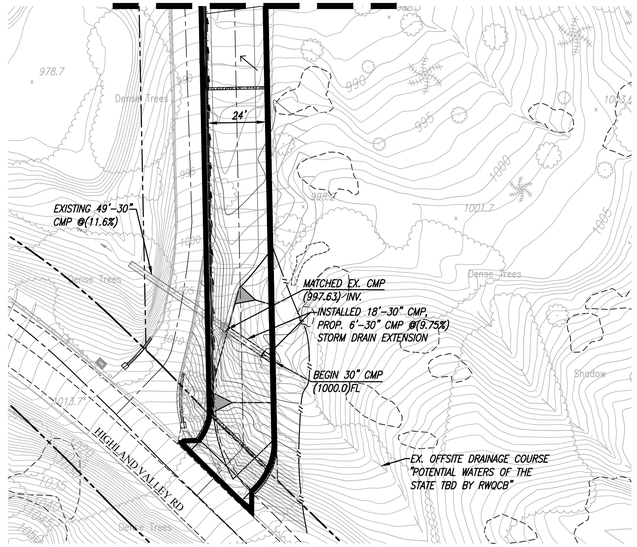
The Hydromodification Management Exhibit must identify:

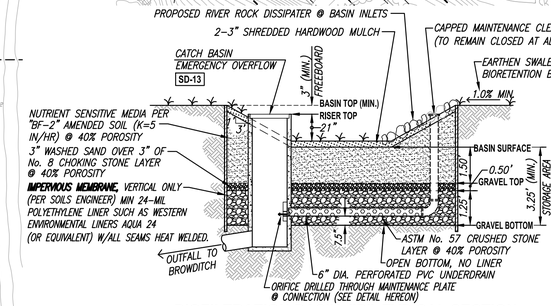
- ☐ Underlying hydrologic soil group
- ☐ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐ Critical coarse sediment yield areas to be protected
- ☐ Existing topography
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Point(s) of Compliance (POC) for Hydromodification Management
- ☐ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)



MATCH LINE ~ SEE UPPER RIGHT

MATCH LINE ~ SEE LOWER LEFT





BIOFILTRATION BASIN "B" TYPICAL SECTION

TYPICAL DETAIL & OUTLET CONNECTION

BIOFILTRATION BASIN BF-1 & BF-2 W/NUTRIENT SENSITIVE MEDIA DESIGN

NOT-TO-SCALE

BIOFILTRATION BASIN MEDIA

PER COUNTY OF SAN DIEGO 2014 LID HANDBOOK, APPENDIX C – FACT SHEETS.

3" MULCH LAYER (MANDATORY)

A MINIMUM OF 3 INCHES OF WELL-AGED, SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS IS PROVIDED. MULCH MUST BE NON-FLOATING TO AVOID CLOGGING OF OVERFLOW STRUCTURE.

18" AMENDED SOIL LAYER

COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD (1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

DRAINAGE LAYER

SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 3 INCHES OF WASHED SAND (ASTM NO. 33), FOLLOWED BY 3 INCHES OF CHOKING STONE (ASTM NO. 8), OVER A 1.25-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION

AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.

SELF-MITIGATING DMAS

SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

- *VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.*
- *SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.*
- *THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.*
- *IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).*
- *THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.*

DRAINAGE AREA TABLE								OFFSITE
SYMBOL	PROPOSED SURFACE	AREA A	AREA B	AREA C	AREA D	AREA E	AREA AO	AREA O
SOIL TYPE		TYPE "C"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "C"	TYPE "C"
	ROOFTOPS	0 SF	9,753 SF	0 SF	0 SF	0 SF	0 SF	0 SF
	AC PAVING, WALKWAYS, HARDSCAPE, ETC.	0 SF	18,907 SF	0 SF	0 SF	0 SF	1,843 SF	5,345 SF
	STABILIZED PERVIOUS AREA	23,097 SF	64,491 SF	51,512 SF	39,562 SF	12,253 SF	1,846 SF	0 SF

30 15 0 30 60 90

SCALE: 1" = 30'

SEDIMENT PRODUCING CUT SLOPE

SEDIMENT PRODUCING FILL SLOPE

LEGEND

PROJECT BOUNDARY

PROP. CONCENTRATED FLOW

PROP. SHEET FLOW

DRAINAGE AREA BOUNDARY

DRAINAGE AREA DESIGNATION (E)

TOTAL PARCEL AREA

223,264 SQUARE FEET

SITE ADDRESS:

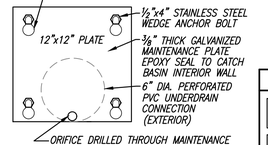
HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

APN:

276-030-48 & 49



MAINTENANCE PLATE DETAIL

ATTACH TO INTERIOR INLET WALL OF CATCH BASIN

PRIVATE CONTRACT

SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

BMP PLAN FOR:

RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER — JOSHUA R. ZEIGLER — No. 85413 — CIVIL — STATE OF CALIFORNIA

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

PLOT DATE: 11/27/2018 6:55 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160DA.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 ARN


14-160 ResQue Ranch
CCSYA
Highland Valley Rd
© 2016 Google
Google earth
1994
Imagery Date: 3/22/2016 33° 4.116' N 116° 59.534' W elev 1106 ft eye alt 2669 ft

TECHNICAL MEMORANDUM:

SWMM Modeling for Hydromodification Compliance of:

ResQue Ranch

Prepared For:

Spear & Associates

July 27, 2016

Revised: April 24, 2017; May 3, 2018.

Prepared by:

Luis Parra, PhD, CPSWQ, ToR, D.WRE.
R.C.E. 66377

REC Consultants
2442 Second Avenue
San Diego, CA 92101
Telephone: (619) 232-9200

TECHNICAL MEMORANDUM :
HYDROMODIFICATION COMPLIANCE USING SWMM

TO: Josh Zeigler, Vice President
Spears & Associates, Inc.

FROM: Luis Parra, PhD, PE, CPSWQ, ToR, D.WRE.

DATE: July 26, 2016 (Revised April 24, 2017; May 3, 2018)

RE: Summary of SWMM Modeling for Hydromodification Compliance for ResQue Ranch, San Diego County, CA.

INTRODUCTION

This memorandum summarizes the approach used to model the proposed residential development site in the City of Valley Center using the Environmental Protection Agency (EPA) Storm Water Management Model 5.0 (SWMM). SWMM models were prepared for the pre and post-developed conditions at the site in order to determine if the proposed LID biofiltration facilities have sufficient volume to meet Order R9-2013-001 requirements of the California Regional Water Quality Control Board San Diego Region (SDRWQCB), as explained in the Final Hydromodification Management Plan (HMP), dated March 2011, prepared for the County of San Diego by Brown and Caldwell. As an additional objective, this SWMM analysis will provide the peak flows needed to calculate the Erosion Potential (E_p) of the discharge releases in both pre and post-development condition to satisfy No Net Impact in Terms of Critical Coarse Sediment Yield (CCSY), which is part of another REC Technical Memorandum "Demonstration of No Net Impact to CCSY for ResQue Ranch".

SWMM MODEL DEVELOPMENT

The ResQue project proposes the construction of horse stables and other horse facilities including access roads. Two (2) SWMM models were prepared for this study: the first for the pre-developed and the second for the post-developed conditions. The project site drains to one (1) Point of Compliance (POC), POC-1, located to the northwest of the project area (Please see Pre and Post Exhibits located in Attachment 5).

The SWMM model was used since we have found it to be more comparable to San Diego area watersheds than the alternative San Diego Hydrology Model (SDHM) and also because it is a non-proprietary model approved by the HMP document. For both SWMM models, flow duration curves were prepared to determine if the proposed HMP facilities are sufficient to meet the current HMP requirements.

The inputs required to develop SWMM models include rainfall, watershed characteristics, and BMP configurations. The Lake Wohlford gauge from the Project Clean Water website was used for this study, since it is the most representative of the project site precipitation due to elevation and proximity to the project site. Please see gauge location and project location map on Attachment 5.

Per the California Irrigation Management Information System "Reference Evaporation Zones" (CIMIS ETo Zone Map), the project site is located within the Zone 9 Evapotranspiration Area. Thus, evapotranspiration values for the site were modeled using Zone 9 average monthly values from Table G.1-1 from the City of San Diego 2016 BMP Design Manual. The site was modeled with Types B, C and D hydrologic soil as these are the existing soils determined from the NRCS Soil Survey. Soils have been assumed to be uncompacted in the no longer existing condition to represent the previously existing natural condition of the site, while fully compacted in the post developed conditions. Other SWMM inputs for the subareas are discussed in the appendices to this document, where the selection of the parameters is explained in detail.

HMP MODELING

EXISTING CONDITIONS

In current existing conditions, the project site is mostly undeveloped and lightly vegetated with mild natural drainage flow paths conveying the flows to their respective POC. The site has one (1) POC in the NW corner.

In pre-development conditions, the area has been divided into 6 sub-areas due to soil types: Soil B area (B-a) sheet-flowing to soil D area (D), sheet-flowing to soil C area (C-a); soil B area (B-b) sheet-flowing to soil C area directly (C-b) and soil C area from the entrance to the property (C-out). Table 1 shows the summary of pre-development sub-areas.

TABLE 1 – SUMMARY OF EXISTING CONDITIONS

DMA	Tributary Area, A (acres)	Impervious Percentage, Ip[(1)]
B-a	0.3703	0.0%
D	0.8188	0.0%
C-a	1.1823	0.0%
B-b	0.3283	0.0%
C-b	2.4258	0.0%
C-out	0.1837	0.0%
Total	**5.3092**	**0%**

DEVELOPED CONDITIONS

Runoff from the developed project site is drained to one (1) POC. The patter of drainage has been divided significantly to account for specific runoff paths associated with slope areas (both cut and fill) which will be diverted out of the LIDs so that the runoff can be considered coarse-sediment-carrying runoff. The path of each sub-area (displayed in Attachment 7) can be basically grouped in 3 paths: areas draining to LID-1 (soil D areas and soil C areas); areas draining to LID-s (C areas, one outside property boundaries, and one inside the property) and areas diverted to the POCs (there are 5 possible paths, ending at sub-areas 1b, 2, 5b, 5c, 13 and 14, which drain directly to POC-1).

Table 2 provides a summary of all DMAs in developed conditions. It is assumed all storm water quality requirements for the project will be met by the LID BMPs. However, detailed water quality requirements are not discussed within this technical memo. For further information in regards to storm water quality requirements for the project and drawdown calculations, please refer to the site specific Storm Water Quality Management Plan (SWQMP).

TABLE 2 – SUMMARY OF DEVELOPED CONDITIONS

Sub-area	Drains to:	Tributary Area, A (ac) [(1)]	Impervious Percentage, I_p
9a	15	0.0833	0%
15	16	0.0468	0%
8	16	0.0044	0%
16	11	0.1753	0%
6	11	0.0511	0%
12a	11	0.0259	0%
11	10	0.3574	0%
10	7	0.1530	0%
7	14	0.0134	0%
14	POC	0.0129	0%
17	18	0.0248	0%
18	12b	0.2930	0%
9	12b	0.1750	0%
12b	13	0.0074	0%
3a	5a	0.0475	0%
5a	13	0.0765	0%
13	POC	0.0669	0%
4	POC	0.1144	0%
3b	5c	0.0197	0%
5c	POC	0.0981	0%
5b	POC	0.1172	0%
2	POC	0.3660	0%
1	1b	0.4769	0%
1b	POC	0.0702	0%
D-LID1	LID1	0.0924	0%
C-LID1	LID1	2.0046	34.1 %
LID1	POC	0.0919	0%
AO	LID2	0.0550	19.7 %
Out	LID2	0.1837	66.8 %
LID2	POC	0.0056	0%
Total	**POC**	**5.3092**	**15.4%**

Two LID BMPs (a biofiltration and an infiltration basin) are located within the project site and are responsible for handling water quality and hydromodification requirements for the project. In developed conditions, the basins will have a surface depth and a riser spillway structure (21 inch above the surface for LID-1 and 6 inches above the surface for LID-2). Flows will then discharge from the basins via the surface overflow or infiltrate through the amended soil of the facilities to the gravel layer and

low flow orifice discharge. The riser structure will act as a spillway such that peak flows can be safely discharged to the receiving storm drain system. From the modeling point of view, routing of runoff in the surface is not necessary as the ponding elevation allowed over the risers is less than 3 inches and no attenuation of the peak flows is expected.

Beneath the basins' invert lies the proposed LID biofiltration portion of the drainage facility. This portion of the basin is comprised of a 3-inch layer of mulch, an 18-inch layer of amended soil (a highly sandy, organic rich composite with an infiltration capacity of at least 5 inches/hr) and a layer of gravel (21 inches for LID-1 and 18 inches for LID-2). The basins will be lined vertically (to avoid lateral infiltration) but unlined at the bottom.

It should be noted that due to the measured infiltration rate obtained from the site investigation that no LID orifice (and corresponding French drain) will be incorporated within LID-2. All flows beneath the surface riser will infiltrate into the underlying soil.

The biofiltration/infiltration basins were modeled using the biofiltration LID module within SWMM. The biofiltration/infiltration module can model the amended soil layer, and a surface storage pond up to the elevation of the invert of the spillway. It should be noted that detailed outlet structure location and elevations will be shown on the construction plans based on the recommendations of this study.

BMP MODELING FOR HMP PURPOSES

Modeling of dual purpose Water Quality/HMP BMPs

Two LID BMP biofiltration/infiltration basins are proposed for water quality treatment and hydromodification conformance for the project site, for a total of 2 BMPs. Tables 3 illustrates the dimensions required for HMP compliance according to the SWMM model that was undertaken for the project.

TABLE 3 – SUMMARY OF DEVELOPED DUAL PURPOSE BMPs

BMP	DIMENSIONS					
	Surface Bottom	**Area at Crest**	**Area of BMP**	**Surface elev. when A = A_{BMP}**	**Riser height at surface**	**Total Surface Depth(1) (ft)**
LID-1	3172 ft^2	4441 ft^2	4004 ft^2	12 in	21 in	24 in
LID-2	148.3 ft^2	353.1 ft^2	243.6 ft^2	6 in	6 in	12 in

BMP	Riser Perimeter(2)	Diameter of French Drain(3)	Low Flow Orifice (in)	Total Gravel Depth(1)	Gravel below French Drain
LID-1	8 ft	6"	1.625"	21 in	7.5 in
LID-2(4)	4 ft	N/A	N/A	18 in	N/A

Notes:
(1): Surface depth from top of amended soil to crest elevation. Mulch layer of 3" is included here.
(2): Minimum dimensions. Riser can be larger in perimeter as the model does not account routing
(3): Minimum recommended French Drain diameter.

FLOW DURATION CURVE COMPARISON

The Flow Duration Curve (FDC) for the site was compared at each POC by exporting the hourly runoff time series results from SWMM to a spreadsheet.

Q_2 and Q_{10} were determined with a partial duration statistical analysis of the runoff time series in an Excel spreadsheet using the Cunnane plotting position method (which is the preferred plotting methodology in the HMP Permit). As the SWMM Model includes a statistical analysis based on the Weibull Plotting Position Method, the Weibull Method was also used within the spreadsheet to ensure that the results were similar to those obtained by the SWMM Model.

The range between 10% of Q_2 and Q_{10} was divided into 100 equal time intervals; the number of hours that each flow rate was exceeded was counted from the hourly series. Additionally, the intermediate peaks with a return period "i" were obtained (Q_i with i=3 to 9). For the purpose of the plot, the values were presented as percentage of time exceeded for each flow rate. FDC comparison at each POC is illustrated in Figure 1 in both normal and logarithmic scale.

As can be seen in Figure 1, the FDC for the proposed condition with the HMP BMPs is within 110% of the curve for the existing condition in both peak flows and durations. The additional runoff volume generated from developing the site will be released to the existing point of discharge at a flow rate below the 10% Q_2 lower threshold for POC-1. Additionally, the project will also not increase peak flow rates between the Q_2 and the Q_{10}, as shown in the peak flow tables in Attachment 1.

Discussion of the Manning's coefficient (Pervious Areas) for Pre and Post-Development Conditions

Typically the Manning's coefficient is selected as n = 0.10 for pervious areas and n = 0.012 for impervious areas. Due to the complexity of the model carried out in pre and post-development conditions, a more accurate value of the Manning's coefficient for pervious areas has been chosen. Taken into consideration the "Handouts on Supplemental Guidance – Handout #2: Manning's "n" Values for Overland Flow Using EPA SWMM V.5" by the County of San Diego (Reference [6]) a more accurate value of n = 0.04 has been selected (see Table 1 of Reference [6] included in Attachment 7). An average n value between the following values: pasture (0.04), average grass (0.04), bare soil (0.025), and dense grass (0.06) (which is also the value of parks and lawns) has been selected per the reference cited, for light rain (<0.8 in/hr) as more than 99% of the rainfall has been measured with this intensity. This average value is approximately n = 0.04.

DRYING TIME

Drying time of the LIDs is based on the assumed infiltration capacity of the soil and the discharge of the LID orifice. For BMP-1 $Q_{orifice}$ is 0.07322 cfs, infiltration flow is 0.0095 cfs (area times 0.103 in/hr expressed as cfs), and surface volume below riser is 3,588 cu-ft. Therefore, T_1 = 3588/(3600·(0.0095+0.07322)) = 12.0 hours. For BMP-2 the infiltration flow is 0.004162 cfs (area times 0.738 in/hr expressed as cfs), and surface volume below riser is 98 cu-ft. Therefore, T_2 = 98/(3600·0.0004162) = 6.5 hours. Both BMPs drain the surface in less than 24 hours, so they satisfy current requirements.

SUMMARY

This study has demonstrated that the proposed HMP BMPs provided for the ResQue Ranch site is sufficient to meet the current HMP criteria for the Point of Compliance (POC), if the cross-section areas and volumes recommended within this technical memorandum, and the respective orifices, riser dimensions and in general, characteristic of each outlet structure are incorporated as specified.

KEY ASSUMPTIONS

1. Types B, C, and D Soils are representative of the existing condition site.
2. Basin 1 and 2 will be unlined only in their vertical walls to allow for infiltration into the underlying Soil Type C.

ATTACHMENTS

1. Q_2 to Q_{10} Comparison Tables
2. Flow Duration Curve Analysis
3. List of the "n" largest Peaks: Pre-Development and Post-Development Conditions
4. Area Vs Elevation & Discharge vs Elevation
5. Pre & Post Development Maps, Project Plan and Section Sketches
6. SWMM Input Data in Input Format (Existing and Proposed Models)
7. EPA SWMM Figures and Explanations
8. NRCS Soils Map & Geotechnical Documentation
9. Summary files from the SWMM Model
10. Response to Comments

REFERENCES

[1] – *"Review and Analysis of San Diego County Hydromodification Management Plan (HMP): Assumptions, Criteria, Methods, & Modeling Tools – Prepared for the Cities of San Marcos, Oceanside & Vista",* May 2012, TRW Engineering.

[2] – *"Final Hydromodification Management Plan (HMP) prepared for the County of San Diego",* March 2011, Brown and Caldwell.

[3] – Order R9-2013-001, California Regional Water Quality Control Board San Diego Region (SDRWQCB).

[4] – "*Handbook of Hydrology*", David R. Maidment, Editor in Chief. 1992, McGraw Hill.

[5] – "*County of San Diego BMP Design Manual*", February 2016.

[6] – *"Improving Accuracy in Continuous Hydrologic Modeling: Guidance for Selecting Pervious Overland Flow Manning's n Values in the San Diego Region"*, TRWE, 2016.

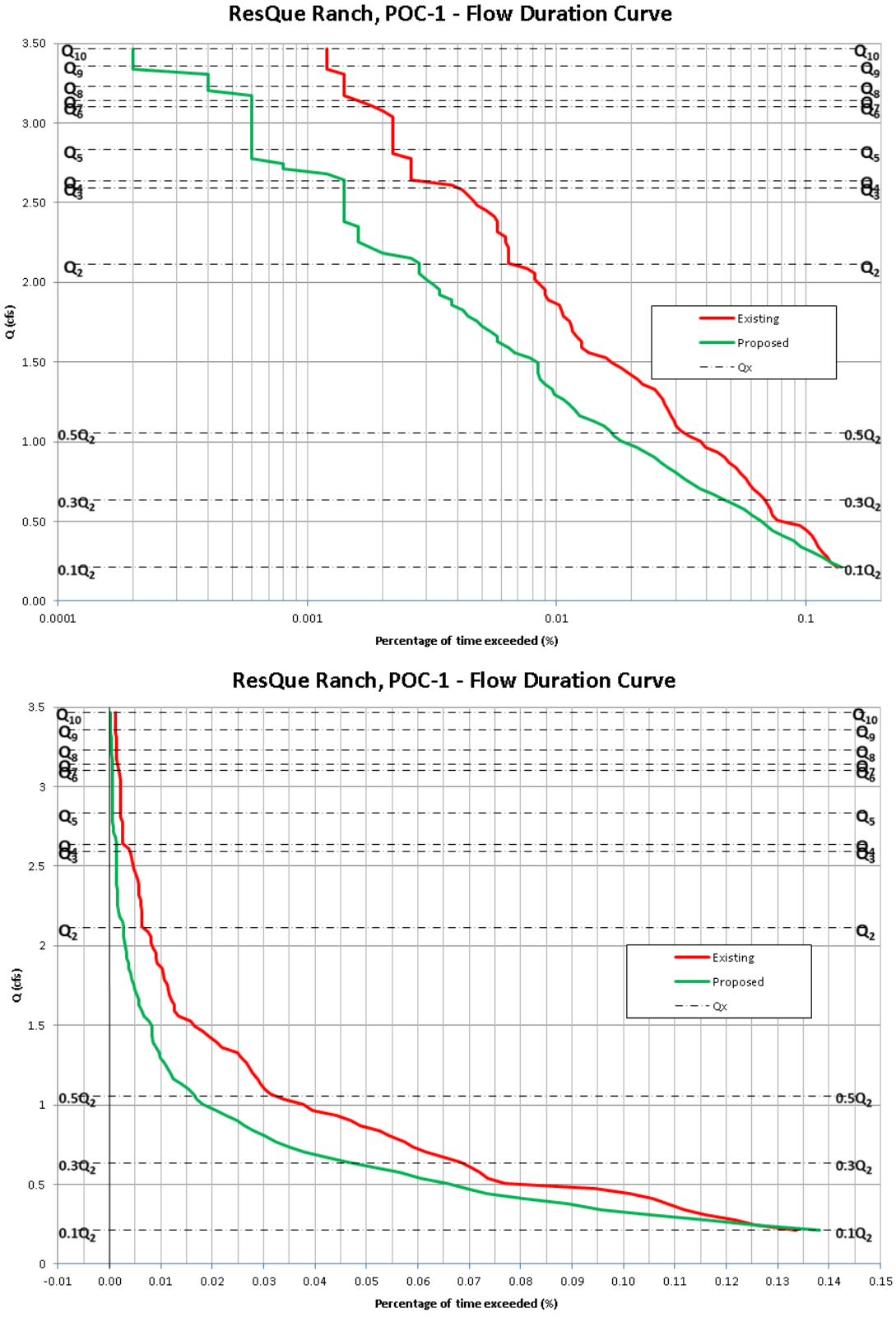
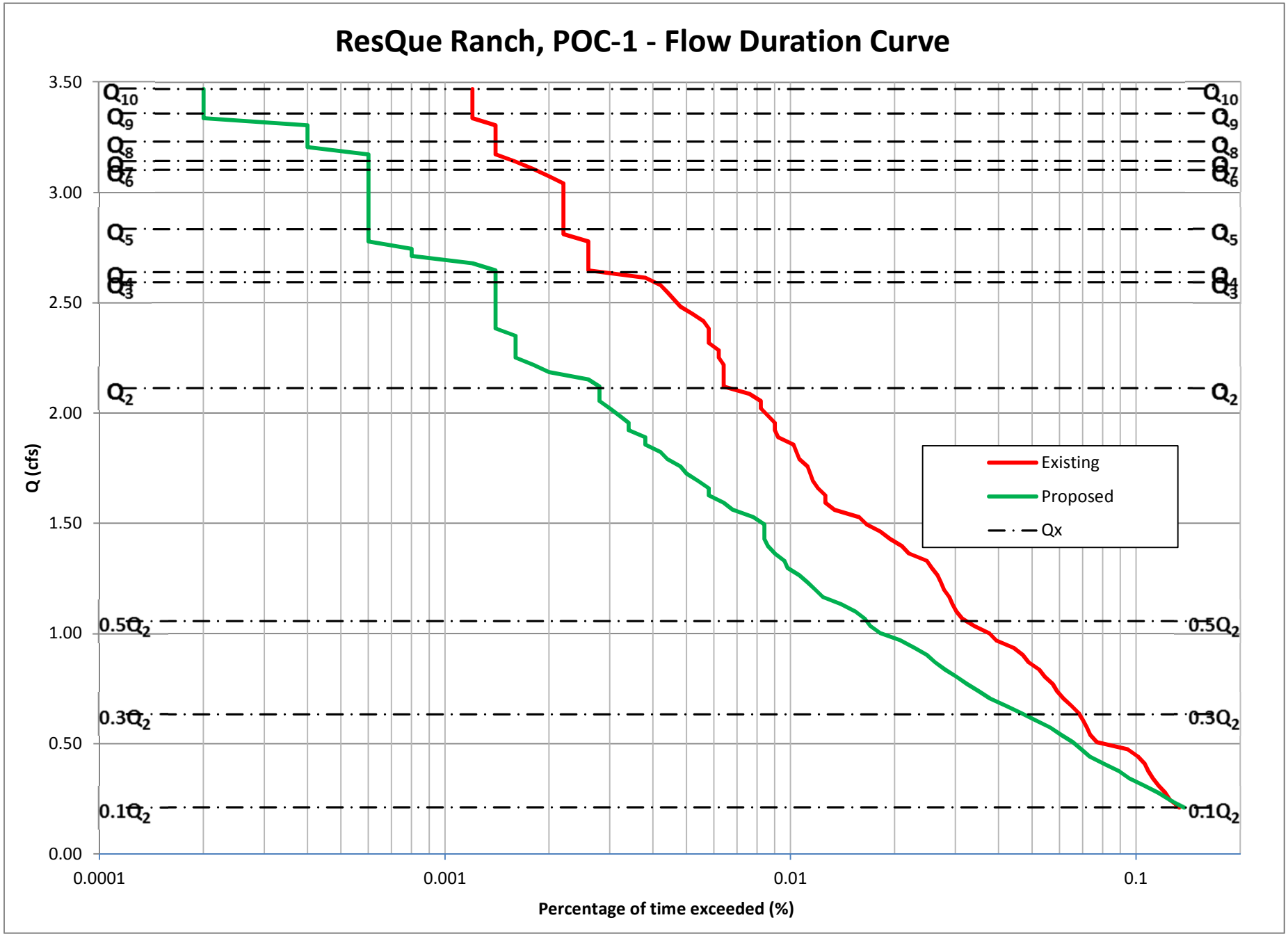


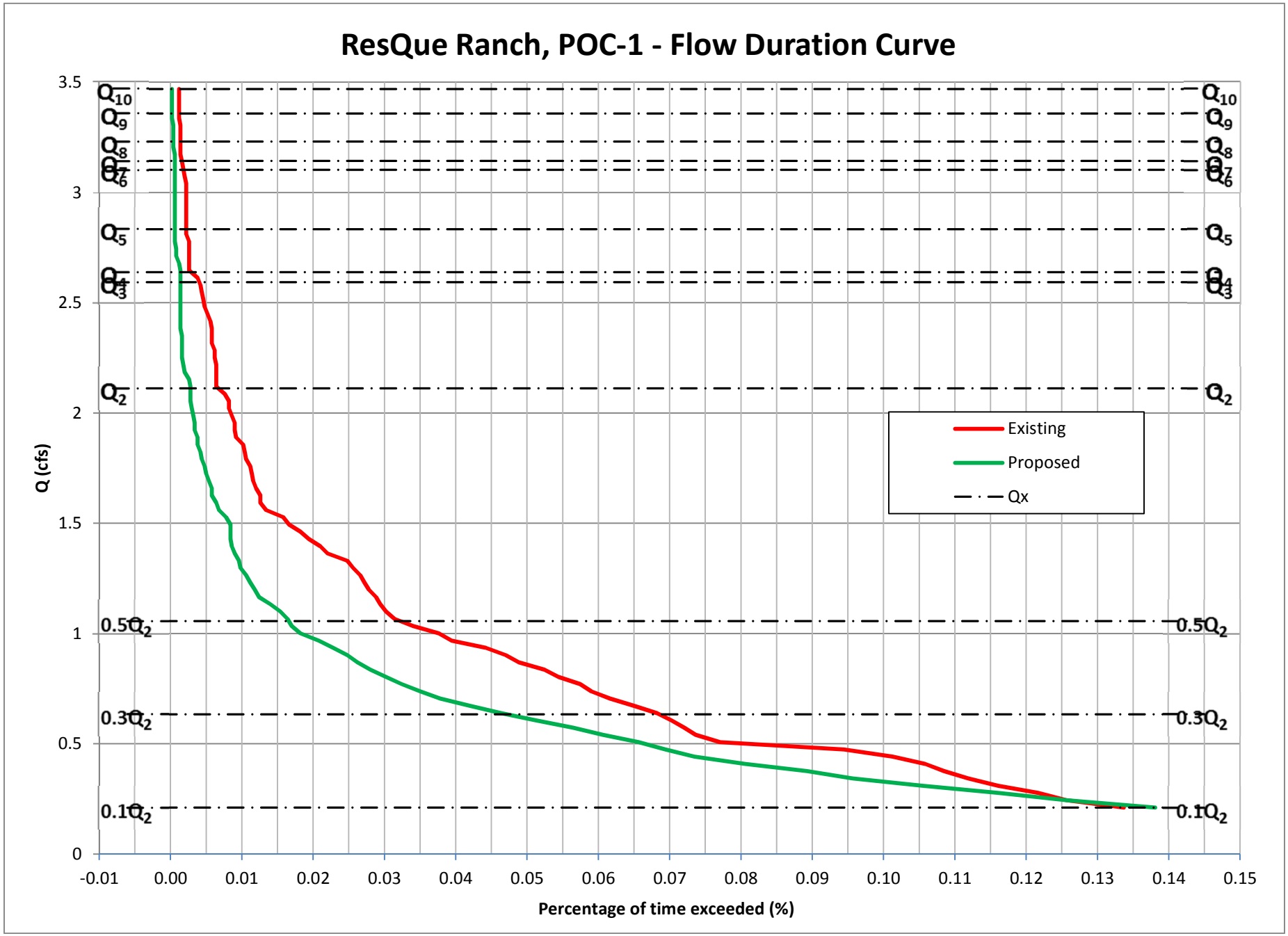
Figure 1a and 1b. Flow Duration Curve Comparison (logarithmic and normal "x" scale)

ATTACHMENT 1

Q_2 to Q_{10} Comparison Table – POC 1

Return Period	Existing Condition (cfs)	Mitigated Condition (cfs)	Reduction, Exist - Mitigated (cfs)
2-year	2.112	1.390	0.722
3-year	2.593	1.670	0.923
4-year	2.639	1.896	0.743
5-year	2.834	2.012	0.821
6-year	3.103	2.150	0.952
7-year	3.143	2.223	0.919
8-year	3.231	2.299	0.933
9-year	3.358	2.441	0.918
10-year	3.469	2.642	0.827


ResQue Ranch, POC-1 - Flow Duration Curve
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Q (cfs)
Q10
Q9
Q8
Q7
Q6
Q5
Q4
Q3
Q2
0.5Q2
0.3Q2
0.1Q2
Existing
Proposed
Qx
0.0001
0.001
0.01
0.1
Percentage of time exceeded (%)


ResQue Ranch, POC-1 - Flow Duration Curve
Q (cfs)
Percentage of time exceeded (%)
3.5
3
2.5
2
1.5
1
0.5
0
-0.01
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
Q10
Q9
Q8
Q7
Q6
Q5
Q4
Q3
Q2
0.5Q2
0.3Q2
0.1Q2
Existing
Proposed
Qx

Flow Duration Curve Data for ResQue Ranch, POC-1, County of San Diego

Q2 =	2.112	cfs	Fraction	10 %
Q10 =	3.47	cfs		
Step =	0.0329	cfs		
Count =	499679	hours		
	57.00	years		

	Existing Condition			Detention Optimized			Pass or
Interval	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	Fail?
1	0.211	668	1.34E-01	690	1.38E-01	103%	Pass
2	0.244	628	1.26E-01	628	1.26E-01	100%	Pass
3	0.277	608	1.22E-01	580	1.16E-01	95%	Pass
4	0.310	580	1.16E-01	527	1.05E-01	91%	Pass
5	0.343	559	1.12E-01	478	9.57E-02	86%	Pass
6	0.376	542	1.08E-01	446	8.93E-02	82%	Pass
7	0.409	529	1.06E-01	403	8.07E-02	76%	Pass
8	0.442	506	1.01E-01	367	7.34E-02	73%	Pass
9	0.474	472	9.45E-02	347	6.94E-02	74%	Pass
10	0.507	385	7.70E-02	328	6.56E-02	85%	Pass
11	0.540	368	7.36E-02	303	6.06E-02	82%	Pass
12	0.573	360	7.20E-02	282	5.64E-02	78%	Pass
13	0.606	351	7.02E-02	256	5.12E-02	73%	Pass
14	0.639	341	6.82E-02	232	4.64E-02	68%	Pass
15	0.672	325	6.50E-02	210	4.20E-02	65%	Pass
16	0.705	308	6.16E-02	189	3.78E-02	61%	Pass
17	0.738	295	5.90E-02	175	3.50E-02	59%	Pass
18	0.771	287	5.74E-02	162	3.24E-02	56%	Pass
19	0.804	272	5.44E-02	151	3.02E-02	56%	Pass
20	0.836	262	5.24E-02	140	2.80E-02	53%	Pass
21	0.869	244	4.88E-02	131	2.62E-02	54%	Pass
22	0.902	235	4.70E-02	124	2.48E-02	53%	Pass
23	0.935	221	4.42E-02	114	2.28E-02	52%	Pass
24	0.968	197	3.94E-02	104	2.08E-02	53%	Pass
25	1.001	188	3.76E-02	91	1.82E-02	48%	Pass
26	1.034	170	3.40E-02	85	1.70E-02	50%	Pass
27	1.067	157	3.14E-02	82	1.64E-02	52%	Pass
28	1.100	151	3.02E-02	77	1.54E-02	51%	Pass
29	1.133	147	2.94E-02	70	1.40E-02	48%	Pass
30	1.165	144	2.88E-02	62	1.24E-02	43%	Pass
31	1.198	139	2.78E-02	59	1.18E-02	42%	Pass
32	1.231	136	2.72E-02	56	1.12E-02	41%	Pass
33	1.264	133	2.66E-02	53	1.06E-02	40%	Pass
34	1.297	128	2.56E-02	49	9.81E-03	38%	Pass
35	1.330	124	2.48E-02	48	9.61E-03	39%	Pass
36	1.363	110	2.20E-02	45	9.01E-03	41%	Pass
37	1.396	105	2.10E-02	43	8.61E-03	41%	Pass

Interval	Existing Condition			Detention Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
38	1.429	97	1.94E-02	42	8.41E-03	43%	Pass
39	1.462	91	1.82E-02	42	8.41E-03	46%	Pass
40	1.495	83	1.66E-02	42	8.41E-03	51%	Pass
41	1.527	79	1.58E-02	39	7.81E-03	49%	Pass
42	1.560	67	1.34E-02	34	6.80E-03	51%	Pass
43	1.593	63	1.26E-02	32	6.40E-03	51%	Pass
44	1.626	63	1.26E-02	29	5.80E-03	46%	Pass
45	1.659	60	1.20E-02	29	5.80E-03	48%	Pass
46	1.692	58	1.16E-02	27	5.40E-03	47%	Pass
47	1.725	57	1.14E-02	25	5.00E-03	44%	Pass
48	1.758	56	1.12E-02	24	4.80E-03	43%	Pass
49	1.791	53	1.06E-02	22	4.40E-03	42%	Pass
50	1.824	52	1.04E-02	21	4.20E-03	40%	Pass
51	1.856	51	1.02E-02	19	3.80E-03	37%	Pass
52	1.889	46	9.21E-03	19	3.80E-03	41%	Pass
53	1.922	45	9.01E-03	17	3.40E-03	38%	Pass
54	1.955	45	9.01E-03	17	3.40E-03	38%	Pass
55	1.988	43	8.61E-03	16	3.20E-03	37%	Pass
56	2.021	41	8.21E-03	15	3.00E-03	37%	Pass
57	2.054	41	8.21E-03	14	2.80E-03	34%	Pass
58	2.087	38	7.60E-03	14	2.80E-03	37%	Pass
59	2.120	32	6.40E-03	14	2.80E-03	44%	Pass
60	2.153	32	6.40E-03	13	2.60E-03	41%	Pass
61	2.186	32	6.40E-03	10	2.00E-03	31%	Pass
62	2.218	32	6.40E-03	9	1.80E-03	28%	Pass
63	2.251	31	6.20E-03	8	1.60E-03	26%	Pass
64	2.284	31	6.20E-03	8	1.60E-03	26%	Pass
65	2.317	29	5.80E-03	8	1.60E-03	28%	Pass
66	2.350	29	5.80E-03	8	1.60E-03	28%	Pass
67	2.383	29	5.80E-03	7	1.40E-03	24%	Pass
68	2.416	28	5.60E-03	7	1.40E-03	25%	Pass
69	2.449	26	5.20E-03	7	1.40E-03	27%	Pass
70	2.482	24	4.80E-03	7	1.40E-03	29%	Pass
71	2.515	23	4.60E-03	7	1.40E-03	30%	Pass
72	2.548	22	4.40E-03	7	1.40E-03	32%	Pass
73	2.580	21	4.20E-03	7	1.40E-03	33%	Pass
74	2.613	19	3.80E-03	7	1.40E-03	37%	Pass
75	2.646	13	2.60E-03	7	1.40E-03	54%	Pass
76	2.679	13	2.60E-03	6	1.20E-03	46%	Pass
77	2.712	13	2.60E-03	4	8.01E-04	31%	Pass
78	2.745	13	2.60E-03	4	8.01E-04	31%	Pass
79	2.778	13	2.60E-03	3	6.00E-04	23%	Pass
80	2.811	11	2.20E-03	3	6.00E-04	27%	Pass
81	2.844	11	2.20E-03	3	6.00E-04	27%	Pass
82	2.877	11	2.20E-03	3	6.00E-04	27%	Pass

Interval	Existing Condition			Detention Optimized			Pass or Fail?
	Q (cfs)	Hours > Q	% time	Hours>Q	% time	Post/Pre	
83	2.909	11	2.20E-03	3	6.00E-04	27%	Pass
84	2.942	11	2.20E-03	3	6.00E-04	27%	Pass
85	2.975	11	2.20E-03	3	6.00E-04	27%	Pass
86	3.008	11	2.20E-03	3	6.00E-04	27%	Pass
87	3.041	11	2.20E-03	3	6.00E-04	27%	Pass
88	3.074	10	2.00E-03	3	6.00E-04	30%	Pass
89	3.107	9	1.80E-03	3	6.00E-04	33%	Pass
90	3.140	8	1.60E-03	3	6.00E-04	38%	Pass
91	3.173	7	1.40E-03	3	6.00E-04	43%	Pass
92	3.206	7	1.40E-03	2	4.00E-04	29%	Pass
93	3.239	7	1.40E-03	2	4.00E-04	29%	Pass
94	3.271	7	1.40E-03	2	4.00E-04	29%	Pass
95	3.304	7	1.40E-03	2	4.00E-04	29%	Pass
96	3.337	6	1.20E-03	1	2.00E-04	17%	Pass
97	3.370	6	1.20E-03	1	2.00E-04	17%	Pass
98	3.403	6	1.20E-03	1	2.00E-04	17%	Pass
99	3.436	6	1.20E-03	1	2.00E-04	17%	Pass
100	3.469	6	1.20E-03	1	2.00E-04	17%	Pass
max	5.448						

Peak Flows calculated with Cunnane Plotting Position

Return Period (years)	Pre-dev. Q (cfs)	Post-Dev. Q (cfs)	Reduction (cfs)
10	3.469	2.642	0.827
9	3.358	2.441	0.918
8	3.231	2.299	0.933
7	3.143	2.223	0.919
6	3.103	2.150	0.952
5	2.834	2.012	0.821
4	2.639	1.896	0.743
3	2.593	1.670	0.923
2	2.112	1.390	0.722

ATTACHMENT 3

List of the "n" Largest Peaks: Pre & Post-Developed Conditions

Basic Probabilistic Equation:

R = 1/P R: Return period (years).

P: Probability of a flow to be equaled or exceeded any given year (dimensionless).

Cunnane Equation:

$$P = \frac{i-0.4}{n+0.2}$$

Weibull Equation:

$$P = \frac{i}{n+1}$$

i: Position of the peak whose probability is desired (sorted from large to small).

n: Number of years analyzed.

Explanation of Variables for the Tables in this Attachment

Peak: Refers to the peak flow at the date given, taken from the continuous simulation hourly results of the n year analyzed.

Posit: If all peaks are sorted from large to small, the position of the peak in a sorting analysis is included under the variable Posit.

Date: Date of the occurrence of the peak at the outlet from the continuous simulation

Note: All peaks are not annual maxima; instead they are defined as event maxima, with a threshold to separate peaks of at least 12 hours. In other words, any peak P in a time series is defined as a value where dP/dt = 0, and the peak is the largest value in 25 hours (12 hours before, the hour of occurrence and 12 hours after the occurrence, so it is in essence a daily peak).

List of Peak events and Determination of Q2 and Q10 (Pre-Development)
ResQue Ranch, POC-1, County of San Diego

T (Year)	Cunnane (cfs)	Weibull (cfs)	Peaks (cfs)			Period of Return (Years)	
10	**3.47**	**3.53**		Date	Posit	Weibull	Cunnane
9	**3.36**	**3.41**	1.4995	11/16/1972	57	1.02	1.01
8	**3.23**	**3.28**	1.5292	12/30/1951	56	1.04	1.03
7	**3.14**	**3.15**	1.5346	2/11/1959	55	1.05	1.05
6	**3.10**	**3.11**	1.5435	11/15/1952	54	1.07	1.07
5	**2.83**	**2.90**	1.551	2/20/1980	53	1.09	1.09
4	**2.64**	**2.64**	1.5599	2/18/1980	52	1.12	1.11
3	**2.59**	**2.60**	1.5633	10/18/2005	51	1.14	1.13
2	**2.11**	**2.11**	1.5872	12/17/1957	50	1.16	1.15
			1.6332	11/22/1965	49	1.18	1.18
			1.6338	1/18/1952	48	1.21	1.20
			1.653	11/21/1963	47	1.23	1.23
			1.662	11/11/1972	46	1.26	1.25
			1.7182	1/14/1993	45	1.29	1.28
			1.7255	2/11/1962	44	1.32	1.31
			1.759	4/3/1958	43	1.35	1.34
			1.7632	3/5/1995	42	1.38	1.38
			1.8521	3/1/1991	41	1.41	1.41
			1.8617	4/14/2003	40	1.45	1.44
			1.873	12/9/1982	39	1.49	1.48
			1.8808	2/27/1983	38	1.53	1.52
			1.9086	1/3/1977	37	1.57	1.56
			1.9649	3/1/1983	36	1.61	1.61
			1.9779	1/7/1993	35	1.66	1.65
			1.9886	3/27/1991	34	1.71	1.70
			2.0097	12/29/2004	33	1.76	1.75
			2.0611	3/8/1975	32	1.81	1.81
			2.0747	1/9/1998	31	1.87	1.87
			2.1074	12/19/1984	30	1.93	1.93
			2.1123	1/23/1969	29	2.00	2.00
			2.1178	10/18/2004	28	2.07	2.07
			2.248	2/14/1980	27	2.15	2.15
			2.2899	2/3/1998	26	2.23	2.23
			2.3843	1/11/2005	25	2.32	2.33
			2.4196	11/30/1982	24	2.42	2.42
			2.4652	2/16/1980	23	2.52	2.53
			2.4815	2/13/1992	22	2.64	2.65
			2.5215	11/8/2002	21	2.76	2.78
			2.5786	9/10/1976	20	2.90	2.92
			2.6069	3/17/1982	19	3.05	3.08
			2.6098	11/9/2002	18	3.22	3.25
			2.6161	8/26/2007	17	3.41	3.45
			2.6273	12/5/1966	16	3.63	3.67
			2.6387	1/16/1978	15	3.87	3.92
			2.6391	12/6/1966	14	4.14	4.21
			2.7915	2/8/1993	13	4.46	4.54
			2.7944	2/15/1986	12	4.83	4.93
			3.06	1/9/2005	11	5.27	5.40
			3.101	12/25/1983	10	5.80	5.96
			3.1273	1/11/1980	9	6.44	6.65
			3.1666	1/29/1980	8	7.25	7.53
			3.3217	2/14/1998	7	8.29	8.67
			3.4925	1/4/1995	6	9.67	10.21
			3.6987	3/4/1978	5	11.60	12.43
			3.901	10/20/2004	4	14.50	15.89
			4.0777	2/4/1994	3	19.33	22.00
			4.4727	2/10/1963	2	29.00	35.75
			5.8051	2/1/1993	1	58.00	95.33

Note:
Cunnane is the preferred method by the HMP permit.

List of Peak events and Determination of Q2 and Q10 (Post-Development)
ResQue Ranch, POC-1, County of San Diego

T (Year)	Cunnane (cfs)	Weibull (cfs)
10	**2.64**	**2.69**
9	**2.44**	**2.53**
8	**2.30**	**2.34**
7	**2.22**	**2.23**
6	**2.15**	**2.17**
5	**2.01**	**2.02**
4	**1.90**	**1.90**
3	**1.67**	**1.67**
2	**1.39**	**1.39**

Note:
Cunnane is the preferred method by the HMP permit.

Peaks (cfs)	Date	Posit	Period of Return (Years) Weibull	Cunnane
0.977	3/2/1980	57	1.02	1.01
0.9826	2/6/1969	56	1.04	1.03
0.9913	2/12/1992	55	1.05	1.05
0.9932	2/18/1980	54	1.07	1.07
1.0047	12/30/1951	53	1.09	1.09
1.0085	11/30/2007	52	1.12	1.11
1.0167	3/16/1958	51	1.14	1.13
1.0193	3/21/1979	50	1.16	1.15
1.0447	12/2/1961	49	1.18	1.18
1.0722	4/3/1958	48	1.21	1.20
1.0875	1/18/1952	47	1.23	1.23
1.1142	1/14/1993	46	1.26	1.25
1.1144	12/9/1982	45	1.29	1.28
1.1477	11/21/1963	44	1.32	1.31
1.1542	4/14/2003	43	1.35	1.34
1.1626	3/1/1991	42	1.38	1.38
1.1781	2/19/1980	41	1.41	1.41
1.2029	3/8/1975	40	1.45	1.44
1.2255	1/3/1977	39	1.49	1.48
1.2556	1/7/1993	38	1.53	1.52
1.2624	2/27/1983	37	1.57	1.56
1.2711	3/27/1991	36	1.61	1.61
1.2848	1/9/1998	35	1.66	1.65
1.2936	3/1/1983	34	1.71	1.70
1.3071	12/19/1984	33	1.76	1.75
1.3436	9/10/1976	32	1.81	1.81
1.351	12/29/2004	31	1.87	1.87
1.3731	2/14/1980	30	1.93	1.93
1.3901	2/16/1980	29	2.00	2.00
1.4082	2/3/1998	28	2.07	2.07
1.505	2/13/1992	27	2.15	2.15
1.5084	11/30/1982	26	2.23	2.23
1.5263	11/8/2002	25	2.32	2.33
1.5455	1/11/2005	24	2.42	2.42
1.5956	3/17/1982	23	2.52	2.53
1.6022	1/16/1978	22	2.64	2.65
1.6038	11/9/2002	21	2.76	2.78
1.665	2/8/1993	20	2.90	2.92
1.6747	2/20/1980	19	3.05	3.08
1.7227	8/26/2007	18	3.22	3.25
1.7971	1/9/2005	17	3.41	3.45
1.8401	11/22/1965	16	3.63	3.67
1.8957	1/11/1980	15	3.87	3.92
1.8961	3/5/1995	14	4.14	4.21
1.9778	12/25/1983	13	4.46	4.54
2.0103	2/14/1998	12	4.83	4.93
2.0247	1/23/1969	11	5.27	5.40
2.1466	2/15/1986	10	5.80	5.96
2.2092	3/4/1978	9	6.44	6.65
2.245	10/20/2004	8	7.25	7.53
2.3738	2/4/1994	7	8.29	8.67
2.6851	2/10/1963	6	9.67	10.21
2.6947	12/5/1966	5	11.60	12.43
2.7474	12/6/1966	4	14.50	15.89
3.2007	1/29/1980	3	19.33	22.00
3.3046	2/1/1993	2	29.00	35.75
3.6384	1/4/1995	1	58.00	95.33

ATTACHMENT 4

AREA VS ELEVATION

Please refer to Table 3 for area of the BMP for different elevations.

DISCHARGE VS ELEVATION

The orifice has been selected to maximize its size while still restricting flows to conform with the required 10% of the Q_2 event flow as mandated in the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011. While REC acknowledges that the orifice is small, to increase the size of the outlet would impact the basin's ability to restrict flows beneath the HMP thresholds, thus preventing the BMP from conformance with HMP requirements.

In order to further reduce the risk of blockage of the orifices, regular maintenance of the riser and orifice must be performed to ensure potential blockages are minimized. A detail of the orifice and riser structure is provided in Attachment 5 of this memorandum.

A stage-discharge relationship is not required in this model as the riser will quickly release all runoff once the LID portion is full. In other words, the attenuating capacity of the riser is negligible because at small depths (one inch or so) the discharge of the riser exceeds the entering peak flows. Therefore, surface routing is not needed in this project as no slots nor orifices are specified at surface levels.

DISCHARGE EQUATIONS

1) Weir:

$$Q_W = C_W \cdot L \cdot H^{3/2} \quad (1)$$

2) Slot:

As an orifice: $$Q_s = B_s \cdot h_s \cdot c_g \cdot \sqrt{2g\left(H - \frac{h_s}{2}\right)} \quad (2.a)$$

As a weir: $$Q_s = C_W \cdot B_s \cdot H^{3/2} \quad (2.b)$$

For H > h_s slot works as weir until orifice equation provides a smaller discharge. The elevation such that equation (2.a) = equation (2.b) is the elevation at which the behavior changes from weir to orifice.

3) Vertical Orifices

As an orifice: $$Q_o = 0.25 \cdot \pi D^2 \cdot c_g \cdot \sqrt{2g\left(H - \frac{D}{2}\right)} \quad (3.a)$$

As a weir: Critical depth and geometric family of circular sector must be solved to determined Q as a function of H:

$$\frac{Q_O^2}{g} = \frac{A_{cr}^3}{T_{cr}}; \quad H = y_{cr} + \frac{A_{cr}}{2 \cdot T_{cr}}; \; T_{cr} = 2\sqrt{y_{cr}(D - y_{cr})}\,; \quad A_{cr} = \frac{D^2}{8}[\alpha_{cr} - sin(\alpha_{cr})]\,;$$

$$y_{cr} = \frac{D}{2}[1 - sin(0.5 \cdot \alpha_{cr})] \quad \text{(3.b.1, 3.b.2, 3.b.3, 3.b.4 and 3.b.5)}$$

There is a value of H (approximately H = 110% D) from which orifices no longer work as weirs as critical depth is not possible at the entrance of the orifice. This value of H is obtained equaling the discharge using critical equations and equations (3.b).

A mathematical model is prepared with the previous equations depending on the type of discharge.

The following are the variables used above:

Q_W, Q_s, Q_O = Discharge of weir, slot or orifice (cfs)

C_W, c_g : Coefficients of discharge of weir (typically 3.1) and orifice (0.61 to 0.62)

L, B_s, D, h_s : Length of weir, width of slot, diameter of orifice and height of slot, respectively; (ft)

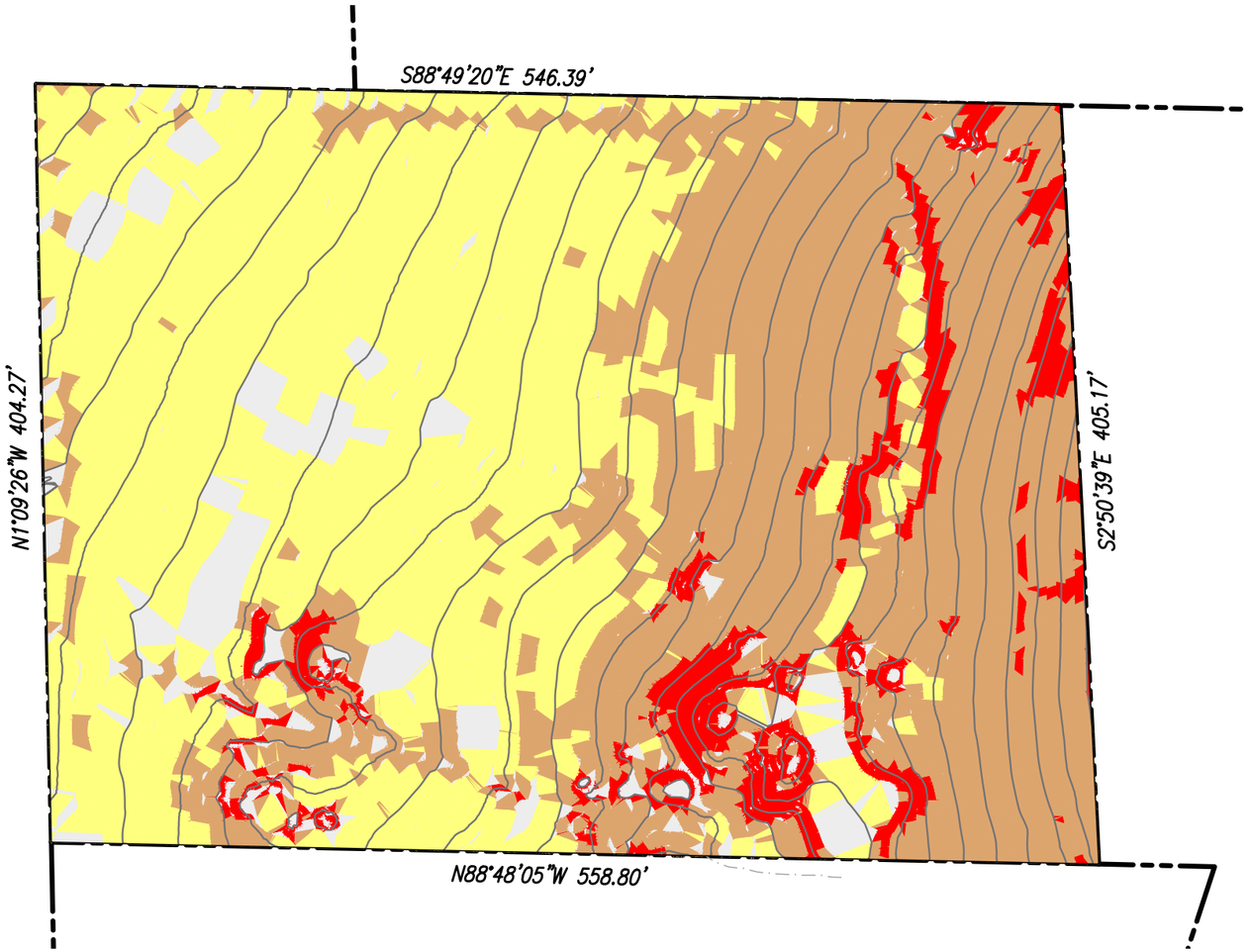
H: Level of water in the pond over the invert of slot, weir or orifice (ft)

A_{cr}, T_{cr}, y_{cr}, α_{cr}: Critical variables for circular sector: area (sq-ft), top width (ft), critical depth (ft), and angle to the center, respectively.

ATTACHMENT 5

Pre & Post-Developed Maps, Project Plan and Detention

Section Sketches



Slope Analysis Table				
Number	Minimum Slope	Maximum Slope	Color	Square footage
1	0.00%	10.00%		15115
2	10.00%	20.00%		104254
3	20.00%	40.00%		88180
4	40.00%	100.00%		15759

PREPARED UNDER THE SUPERVISION OF:

RAMON J. SPEAR L.S. 6404 DATE

LICENSED LAND SURVEYOR
RAMON J. SPEAR
NO. 6404
STATE OF CALIFORNIA

"PRE"

RPO STEEP SLOPE LANDS MAP FOR:
RESQUE RANCH
LOCATION:
HIGHLAND VALLEY ROAD, ESCONDIDO CA

SPEAR & ASSOCIATES, INC
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866

N

SCALE: 1" = 80 '

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O CHARLES "PHIL" PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

APN:

276-030-48 & 49

TOPOGRAPHY SOURCE

SPEAR & ASSOCIATES, INC.
475 PRODUCTION STREET, SAN MARCOS, CA 92078
TOPO SOURCE METHOD : AERIAL TOPOGRAPHY
TOPO SOURCE DATE: 04-20-2015

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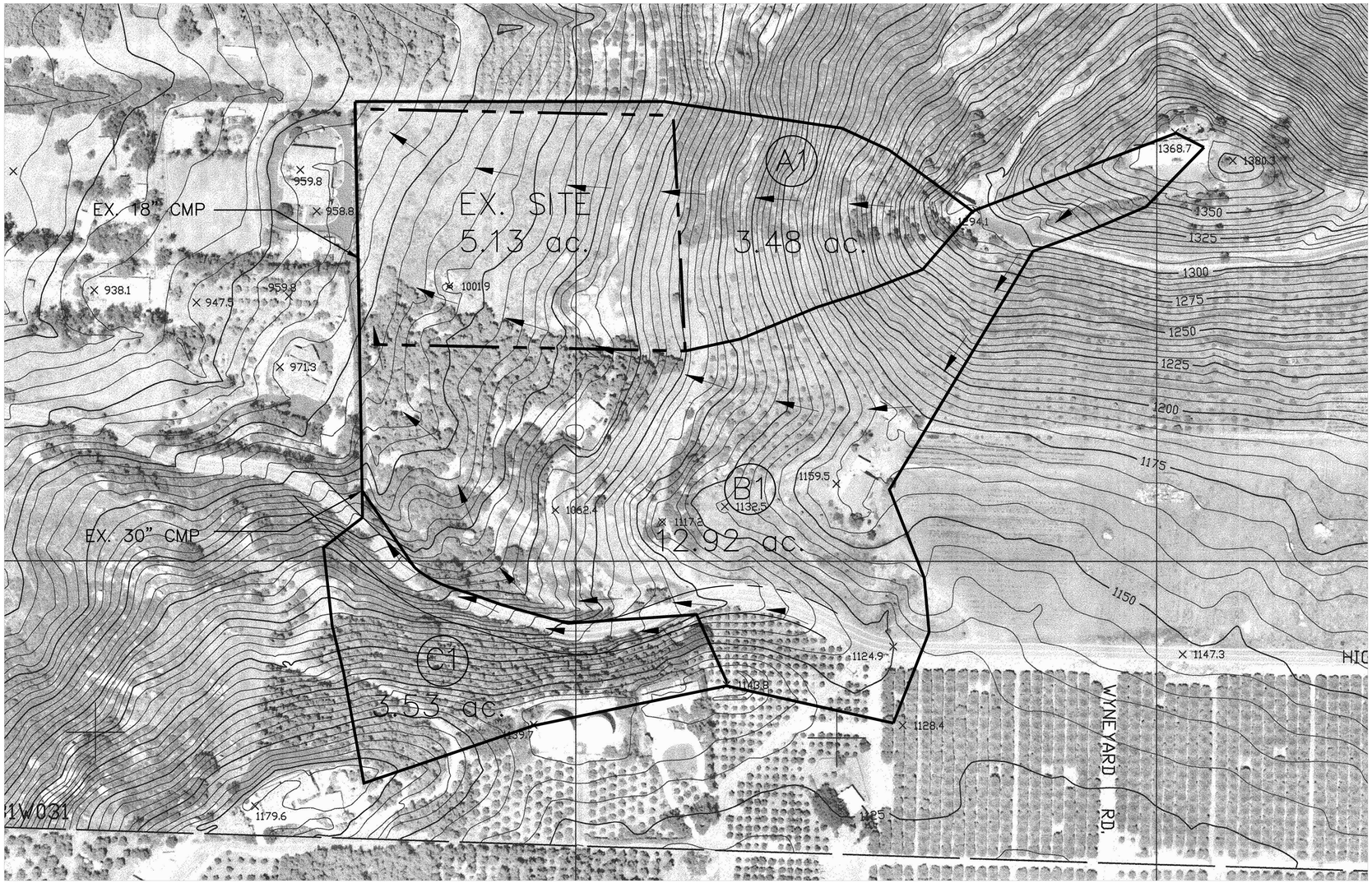


LEGEND

PROJECT BOUNDARY

PROP. CONCENTRATED FLOW

DRAINAGE AREA BOUNDARY

DRAINAGE AREA DESIGNATION (E)

SITE ADDRESS:

HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

APN:

276-030-48 & 49

PRIVATE CONTRACT

SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

PRE DEVELOPMENT DRAINAGE AREA PLAN FOR:

RESQUE RANCH

HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER

BY: _____ DATE

ENGINEER OF WORK:

JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-18

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

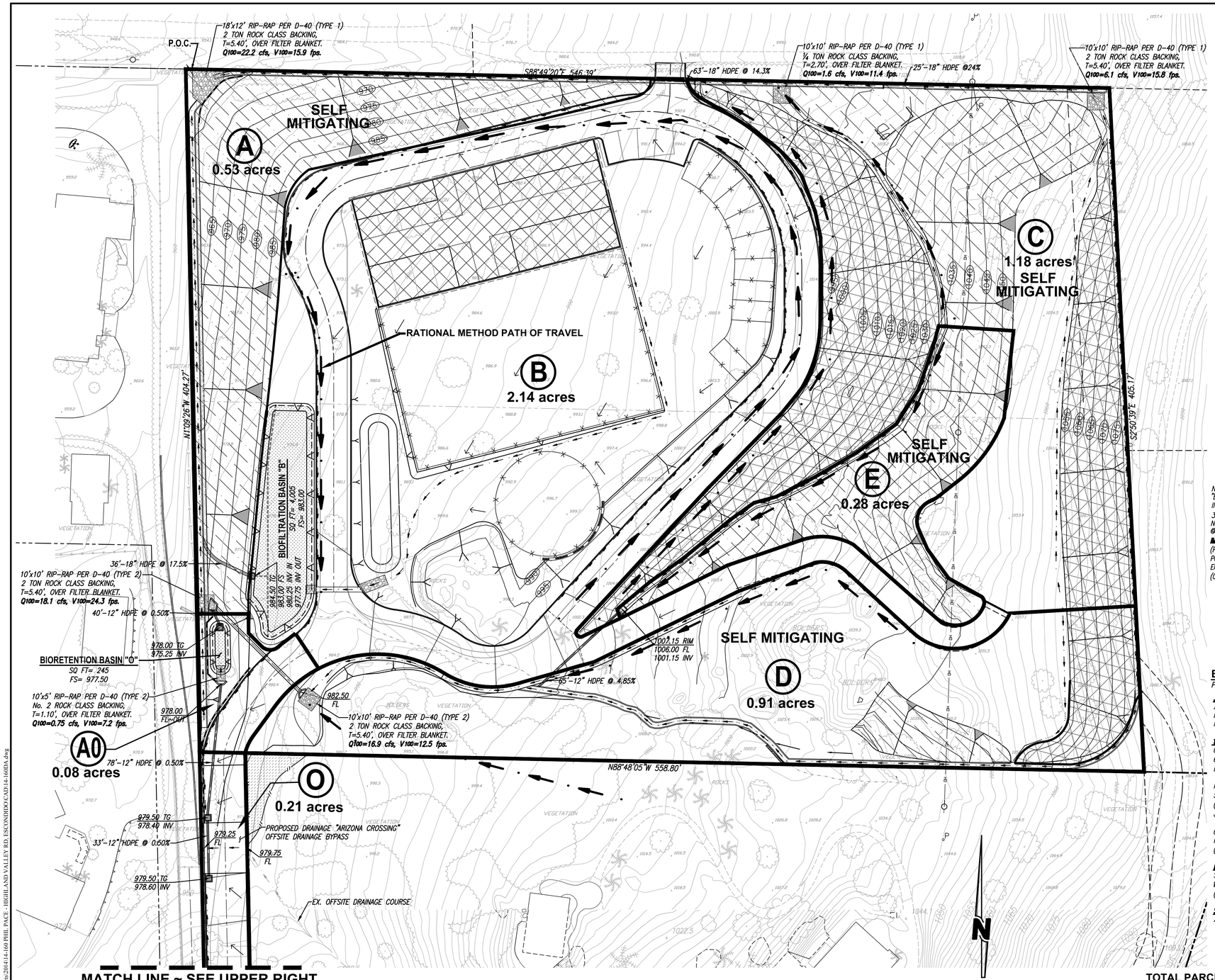
PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER — JOSHUA R. ZEIGLER — No. 85413 — CIVIL — STATE OF CALIFORNIA

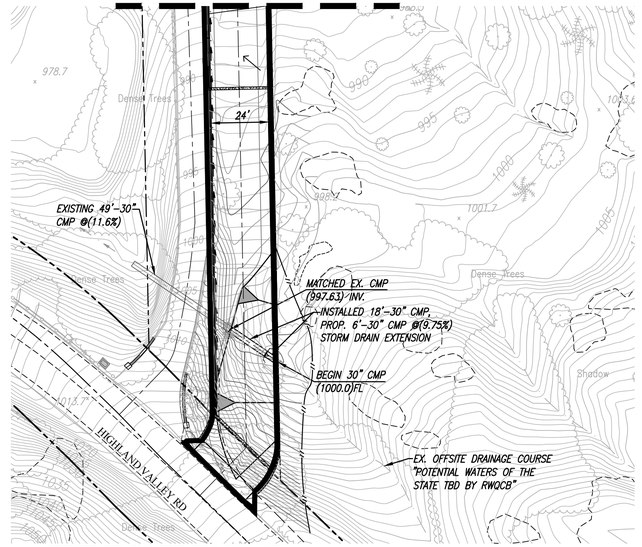
PLOT DATE: 5/8/2018 10:54 AM

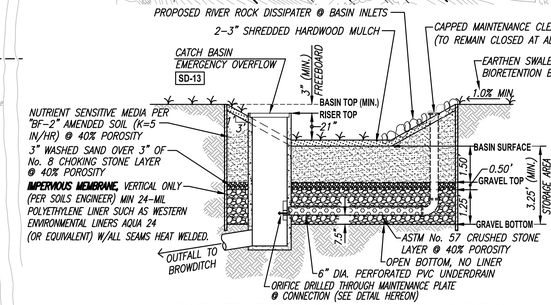
SPEAR & ASSOCIATES PROJECT NO. 14-160 ARN

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040



MATCH LINE ~ SEE LOWER LEFT





BIOFILTRATION BASIN "B" TYPICAL SECTION

TYPICAL DETAIL & OUTLET CONNECTION

BIOFILTRATION BASIN BF-1 & BF-2 W/NUTRIENT SENSITIVE MEDIA DESIGN

NOT-TO-SCALE

BIOFILTRATION BASIN MEDIA

PER COUNTY OF SAN DIEGO 2014 LID HANDBOOK, APPENDIX C – FACT SHEETS.

3" MULCH LAYER (MANDATORY)

A MINIMUM OF 3 INCHES OF WELL-AGED, SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS IS PROVIDED. MULCH MUST BE NON-FLOATING TO AVOID CLOGGING OF OVERFLOW STRUCTURE.

18" AMENDED SOIL LAYER

COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD (1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

DRAINAGE LAYER

SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 3 INCHES OF WASHED SAND (ASTM NO. 33), FOLLOWED BY 3 INCHES OF CHOKING STONE (ASTM NO. 8), OVER A 1.25-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION

AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.

SELF-MITIGATING DMAS

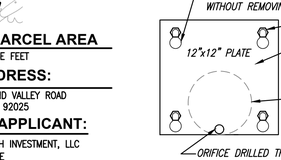
SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

- *VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.*
- *SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.*
- *THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.*
- *IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).*
- *THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.*

LEGEND

PROJECT BOUNDARY
PROP. CONCENTRATED FLOW
PROP. SHEET FLOW
DRAINAGE AREA BOUNDARY
DRAINAGE AREA DESIGNATION (E)

DRAINAGE AREA TABLE								OFFSITE
SYMBOL	PROPOSED SURFACE	AREA A	AREA B	AREA C	AREA D	AREA E	AREA AO	AREA O
SOIL TYPE		TYPE "C"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "C"	TYPE "C"
	ROOFTOPS	0 SF	9,753 SF	0 SF	0 SF	0 SF	0 SF	0 SF
	AC PAVING, WALKWAYS, HARDSCAPE, ETC.	0 SF	18,907 SF	0 SF	0 SF	0 SF	1,843 SF	5,345 SF
	STABILIZED PERVIOUS AREA	23,097 SF	64,491 SF	51,512 SF	39,562 SF	12,253 SF	1,846 SF	0 SF



MAINTENANCE PLATE DETAIL

ATTACH TO INTERIOR INLET WALL OF CATCH BASIN

TOTAL PARCEL AREA

223,264 SQUARE FEET

SITE ADDRESS:

HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

APN:

276-030-48 & 49

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO	
1	DEPARTMENT OF PUBLIC WORKS	1 SHEETS

HYDROMODIFICATION EXHIBIT FOR:

RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET
REGISTERED PROFESSIONAL ENGINEER JOSHUA R. ZEIGLER No. 85413 CIVIL STATE OF CALIFORNIA

PLOT DATE: 11/27/2018 6:56 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD. ESCONDIDO\CAD\14-160DA.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 ARN

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

POC

S88°49'20"E 546.39'

SELF MITIGATING

A
0.53 acres

SOIL TYPE C

C-LID 1

B
2.14 acres

C
1.18 acres
SELF MITIGATING

SELF MITIGATING

E
0.28 acres

SOIL TYPE B

SELF MITIGATING

SOIL TYPE D

D
0.91 acres

LID 1

LID 2

A0
0.08 acres

O
0.21 acres

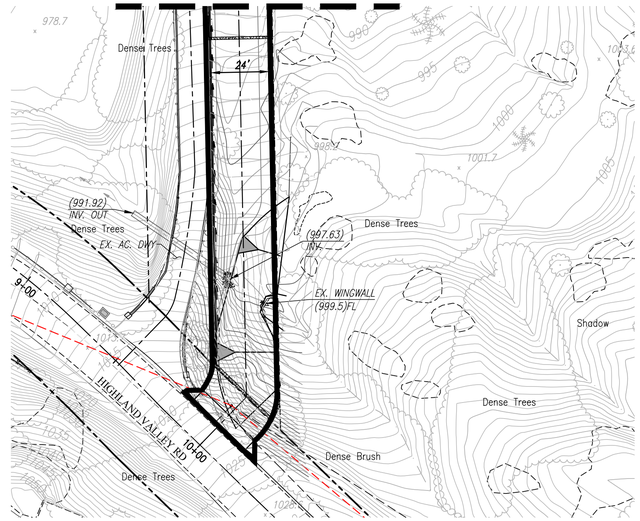
N88°48'05"W 558.80'

N 32°50'53"W 404.27'

S 32°50'53"E 405.17'

MATCH LINE ~ SEE UPPER RIGHT

MATCH LINE ~ SEE LOWER LEFT



LEGEND

- PROJECT BOUNDARY
- PROP. CONCENTRATED FLOW
- PROP. SHEET FLOW
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA DESIGNATION (E)
- SOIL TYPE DELINEATION
- CCSY AREA
- BROWDITCHES (TYPE B)
- FILL SLOPE (CONTRIBUTES CRITICAL COURSE SEDIMENT)
- CUT SLOPE (CONTRIBUTES CRITICAL COURSE SEDIMENT)
- NATURAL 20%–40% (CRITICAL)
- NATURAL GREAT THAN 40% (CRITICAL)

TOTAL PARCEL AREA

223,264 SQUARE FEET

SITE ADDRESS:

HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814–0050

APN:

276–030–48 & 49

PRIVATE CONTRACT

SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

POST DEVELOPMENT CCSY AREA PLAN FOR:

RESQUE RANCH

HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX .

APPROVED FOR:
SIROUS DEYLAMIAN
COUNTY ENGINEER

BY: _____ DATE

ENGINEER OF WORK:
DANNY ABADA R.C.E. NO. 45381 EXP. 9–30–16

GRADING PERMIT NO. PDS2016–

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736–2040 FAX (760) 736–4866
WWW.SPEARINC.NET

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1–760–736–2040

PLOT DATE: 4/25/2017 10:56 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160CCSY Exhibit.dwg

SPEAR & ASSOCIATES PROJECT NO. 14–160 ARN

SILTATION AND SEDIMENT CONTROL MEASURES NOTES:

1. THE SEDIMENT BASINS SHALL BE PROVIDED AT THE LOWER END OF EVERY DRAINAGE AREA PRODUCING SEDIMENT RUNOFF. THE BASINS SHALL BE MAINTAINED AND CLEANED TO DESIGN CONTOURS AFTER EVERY RUNOFF PRODUCING STORM. THE BASINS SHOULD BE SEMI-PERMANENT STRUCTURES THAT WOULD REMAIN UNTIL SOIL STABILIZING VEGETATION HAS BECOME WELL ESTABLISHED ON ALL ERODIBLE SLOPES.
2. SEDIMENT BASINS MAY NOT BE REMOVED OR MADE INOPERATIVE WITHOUT PRIOR APPROVAL OF THE COUNTY ENGINEER.
3. UTILITY TRENCHES THAT ARE CUT THROUGH BASIN DIKES OR BASIN INLET DIKES SHALL BE PLUGGED WITH GRAVEL BAGS FROM TOP OF PIPE TO TOP OF DIKE.
4. ALL UTILITY TRENCHES SHALL BE BLOCKED AT THE PRESCRIBED INTERVALS WITH A DOUBLE ROW OF GRAVEL BAGS WITH A TOP ELEVATION LEVEL WITH, AND TWO GRAVEL BAGS BELOW, THE GRADED SURFACE OF THE STREET. GRAVEL BAGS ARE TO BE PLACED WITH LAPPED COURSES. THE INTERVALS PRESCRIBED BETWEEN GRAVEL BAG BLOCKING SHALL DEPEND ON THE SLOPE OF THE GROUND SURFACE, BUT NOT EXCEED THE FOLLOWING:

GRADE OF THE STREET	INTERVAL
LESS THAN 2%	AS REQUIRED, 200 FEET MAX.
2% TO 4%	100 FEET
4% TO 10%	50 FEET
OVER 10%	25 FEET

5. AFTER UTILITY TRENCHES ARE BACKFILLED AND COMPACTED, THE SURFACE OVER SUCH TRENCHES SHALL BE MOUNDED SLIGHTLY TO PREVENT CHANNELING OF WATER IN THE TRENCH AREA. CARE SHOULD BE EXERCISED TO PROVIDE FOR CROSS FLOW AT FREQUENT INTERVALS WHERE TRENCHES ARE NOT ON THE CENTERLINE OF A CROWNED STREET.
6. ALL BUILDING PADS SHOULD BE SLOPED TOWARDS THE DRIVEWAYS AND VELOCITY CHECK DAMS PROVIDED AT THE BASE OF ALL DRIVEWAYS DRAINING INTO THE STREET.
7. PROVIDE VELOCITY CHECK DAMS IN ALL UNPAVED GRADED CHANNELS AT THE INTERVALS INDICATED BELOW:

GRADE OF CHANNEL	INTERVALS BETWEEN CHECK DAMS
LESS THAN 3%	100 FEET
3% TO 6%	50 FEET
OVER 6%	25 FEET

8. PROVIDE VELOCITY CHECK DAMS IN ALL STREET AREAS ACCORDING TO INTERVALS INDICATED BELOW. VELOCITY CHECK BAGS MAY BE CONSTRUCTED OF GRAVEL BAGS, TIMBER, OR OTHER EROSION RESISTANT MATERIALS APPROVED BY THE COUNTY ENGINEER, AND SHALL EXTEND COMPLETELY ACROSS THE STREET OR CHANNEL AT RIGHT ANGLES TO THE CENTERLINE. VELOCITY CHECK DAMS MAY ALSO SERVE AS SEDIMENT TRAPS.

GRADE OF STREET	INTERVAL	NUMBER OF BAGS HIGH
LESS THAN 2%	AS REQUIRED, 200 FEET MAX.	1
2% TO 4%	100 FEET	1
4% TO 6%	50 FEET	1
6% TO 10%	50 FEET	2
OVER 10%	25 FEET	2

9. PROVIDE A GRAVEL BAG SILT BASIN OR TRAP BY EVERY STORM DRAIN INLET TO PREVENT SEDIMENT FROM ENTERING DRAIN SYSTEM.
10. GRAVEL BAGS AND FILL MATERIAL SHALL BE STOCKPILED AT INTERVALS, READY FOR USE WHEN REQUIRED.
11. ALL EROSION CONTROL DEVICES WITHIN THE DEVELOPMENT SHOULD BE MAINTAINED DURING AND AFTER EVERY RUNOFF PRODUCING STORM, IF POSSIBLE. MAINTENANCE CREWS WOULD BE REQUIRED TO HAVE ACCESS TO ALL AREAS.
12. PROVIDE ROCK RIPRAP ON CURVES AND STEEP DROPS IN ALL EROSION PRONE DRAINAGE CHANNELS DOWNSTREAM FROM THE DEVELOPMENT. THIS PROTECTION WOULD REDUCE EROSION CAUSED BY THE INCREASED FLOWS THAT MAY BE ANTICIPATED FROM DENUDED SLOPES, OR IMPERVIOUS SURFACES.
13. ANY PROPOSED ALTERNATE CONTROL MEASURES MUST BE APPROVED IN ADVANCE BY ALL RESPONSIBLE AGENCIES; I.E.,COUNTY ENGINEER, DEPARTMENT OF ENVIRONMENTAL HEALTH, FLOOD CONTROL, OFFICE OF ENVIRONMENTAL MANAGEMENT, ETC.

EMERGENCY EROSION CONTROL MEASURES NOTES:

1. ALL BUILDING PADS TO BE DIKED AND THE DIKES MAINTAINED TO PREVENT WATER FROM FLOWING FROM THE PAD UNTIL THE STREETS AND DRIVEWAYS ARE PAVED AND WATER CAN FLOW FROM THE PADS WITHOUT CAUSING EROSION, OR CONSTRUCT DRAINAGE FACILITIES TO THE SATISFACTION OF THE COUNTY DEPARTMENT OF PUBLIC WORKS THAT WILL ALLOW WATER TO DRAIN FROM THE PAD WITHOUT CAUSING EROSION.
2. TOPS OF ALL SLOPES TO BE DIKED OR TRENCHED TO PREVENT WATER FROM FLOWING OVER THE CREST OF THE SLOPES.
3. MANUFACTURED SLOPES AND PADS SHALL BE ROUNDED VERTICALLY AND HORIZONTALLY AS APPROPRIATE TO BLEND WITH THE SURROUNDING TOPOGRAPHY.
4. AS SOON AS CUTS OR EMBANKMENTS ARE COMPLETED, BUT NOT LATER THAN OCTOBER 1, ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITH A HYDROMULCH MIXTURE OR AN EQUAL TREATMENT APPROVED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. BETWEEN OCTOBER 1 AND APRIL 30, APPROVED SLOPE PROTECTION MEASURES SHALL PROCEED IMMEDIATELY BEHIND THE EXPOSURE OF CUT SLOPES AND/OR THE CREATION OF EMBANKMENT SLOPES.
5. CATCH BASINS, DESILTING BASINS AND STORM DRAIN SYSTEMS SHALL BE INSTALLED TO THE SATISFACTION OF THE COUNTY DEPARTMENT OF PUBLIC WORKS.
6. GRAVEL BAG CHECK DAMS TO BE PLACED IN A MANNER APPROVED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS IN UNPAVED STREETS WITH GRADIENTS IN EXCESS OF 2% AND ON OR IN OTHER GRADED OR EXCAVATED AREAS AS REQUIRED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.
7. THE DEVELOPER TO MAINTAIN THE PLANTING AND EROSION CONTROL MEASURES DESCRIBED ABOVE UNTIL RELIEVED OF SAME BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. THE DEVELOPER TO REMOVE ALL SOIL INTERCEPTED BY THE GRAVEL BAGS, CATCH BASINS AND DESILTING BASINS AND KEEP THESE FACILITIES CLEAN AND FREE OF SILT AND SAND AS DIRECTED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. THE DEVELOPER SHALL REPAIR AND ERODED SLOPES AS DIRECTED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

STORMWATER MANAGEMENT NOTES:

1. DURING THE RAINY SEASON THE AMOUNT OF EXPOSED SOIL ALLOWED AT ONE TIME SHALL NOT EXCEED THAT WHICH CAN BE ADEQUATELY PROTECTED BY THE PROPERTY OWNER IN THE EVENT OF A RAINSTORM. 125% OF ALL SUPPLIES NEEDED FOR BMP MEASURES SHALL BE MAINTAINED ON THE JOB SITE IN A MANNER THAT ALLOWS FULL DEPLOYMENT AND COMPLETE INSTALLATION IN 48 HOURS OR LESS OF A FORECAST RAIN.
2. NO AREA BEING DISTURBED SHALL EXCEED 50 ACRES AT ANY GIVEN TIME WITHOUT DEMONSTRATING TO THE SAN DIEGO COUNTY DPW DIRECTOR'S SATISFACTION THAT ADEQUATE SEDIMENT AND EROSION CONTROL CAN BE MAINTAINED. ANY DISTURBED AREA THAT IS NOT ACTIVELY GRADED FOR 10 DAYS MUST BE FULLY PROTECTED FROM EROSION. UNTIL ADEQUATE LONG-TERM PROTECTIONS ARE INSTALLED, THE DISTURBED AREA SHALL BE INCLUDED WHEN CALCULATING THE ACTIVE DISTURBANCE AREA. ALL EROSION CONTROL MEASURES SHALL REMAIN INSTALLED AND MAINTAINED DURING ANY INACTIVE PERIOD.
3. THE PROPERTY OWNER IS OBLIGATED TO INSURE COMPLIANCE WITH ALL APPLICABLE STORM WATER REGULATIONS AT ALL TIMES. THE BMPs (BEST MANAGEMENT PRACTICES) THAT HAVE BEEN INCORPORATED INTO THIS PLAN SHALL BE IMPLEMENTED AND MAINTAINED TO EFFECTIVELY PREVENT THE POTENTIALLY NEGATIVE IMPACTS OF THIS PROJECT'S CONSTRUCTION ACTIVITIES ON STORM WATER QUALITY. THE MAINTENANCE OF THE BMPs IS THE PERMITTEE'S RESPONSIBILITY, AND FAILURE TO PROPERLY INSTALL OR MAINTAIN THE BMPs MAY RESULT IN ENFORCEMENT ACTION BY THE COUNTY OF SAN DIEGO OR OTHERS. IF INSTALLED BMPs FAIL THEY MUST BE REPAIRED OR REPLACED WITH AN ACCEPTABLE ALTERNATIVE WITHIN 24 HOURS, OR AS SOON AS SAFE TO DO SO.
4. ON PROJECTS OF GREATER THAN 1 ACRE, A NOTICE OF INTENT (NOI) MUST BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MUST BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF CALIFORNIA GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (PERMIT NO. CAS000002) FOR ALL OPERATIONS ASSOCIATED WITH THESE PLANS. IF APPLICABLE, THE NOI NUMBER ASSIGNED BY SWRCB FOR THIS PROJECT IS 937C375197 AND THE PERMITTEE SHALL KEEP A COPY OF THE SWPPP ON SITE AND AVAILABLE FOR REVIEW BY THE COUNTY.

STABILIZED FIBER MATRIX (SFM)

THE USE OF SFM's IS SUBJECT TO THE FOLLOWING LIMITATIONS AND RESTRICTIONS:

- SFM MAY BE USED FOR TEMPORARY EROSION CONTROL FOR DISTURBED AREAS WITH A SLOPE RATIO OF 1 VERTICAL TO 2 HORIZONTAL OR SHALLOWER, INCLUDING PAD AND SEPTIC FIELD AREAS.
- THE SFM SHALL BE APPLIED AT LEAST 24 HOURS BEFORE OR AFTER RAINFALL AND SHALL BE APPLIED TO PROVIDE 100% COVERAGE. (I.E. APPLIED FROM MULTIPLE DIRECTIONS AND ANGLES).
- THE APPLICATION AREA MUST BE PROTECTED WITH BROW DITCHES AND/OR DIVERSION BERMS AT THE TOP OF SLOPES TO DIVERT FLOW FROM THE FACE OF THE SLOPE.
- FOR PERMANENT EROSION CONTROL PURPOSES, SFM MUST BE INSTALLED IN CONJUNCTION WITH SEEDED EROSION CONTROL VEGETATION OR HAND PLANTINGS. AS WITH ALL OTHER APPLICATIONS, SFM WILL NOT BE CONSIDERED PERMANENT UNTIL 70% VEGETATION ESTABLISHMENT.
- COVERAGE AND CONCENTRATION: FOR EACH ACRE COVERED, THE MINIMUM APPLICATION VOLUME SHALL BE 10 GALLONS NON-TOXIC WATER-PERMEABLE SOIL-STABILIZING LIQUID EMULSION WITH 3000 POUNDS OF HYDRAULIC MULCH. THE EMULSION MUST BE DESIGNED TO PROTECTSOIL, PREVENT EROSION, AND FLOCCULATE (CLUMP) SEDIMENT.
- A LETTER FROM THE HYDROSEED CONTRACTOR CERTIFYING THAT THE SFM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED APPLICATION RATES, COVERAGE, AND MANUFACTURERS DILUTION RATIO SHALL BE SUBMITTED TO THE COUNTY INSPECTOR FOR APPROVAL.

BONDED FIBER MATRIX (BFM)

THE USE OF BFM's IS SUBJECT TO THE FOLLOWING LIMITATIONS AND RESTRICTIONS:

- APPLICATION RATES SHALL BE 3500 POUNDS PER ACRE MINIMUM FOR 2:1 OR SHALLOWER SLOPES AND 4000 POUNDS PER ACRE FOR SLOPES STEEPER THAN 2:1.
- BFM SHALL BE APPLIED AT LEAST 24 HOURS BEFORE OR AFTER RAINFALL.
- THE SITE MUST BE PROTECTED WITH BROW DITCHES AND/OR DIVERSION BERMS AT THE TOP OF SLOPES TO DIVERT FLOW FROM THE FACE OF THE SLOPE.
- BFM SHALL BE APPLIED TO PROVIDE 100% COVERAGE (i.e. APPLICATION FROM MULTIPLE ANGLES).
- FOR PERMANENT EROSION CONTROL PURPOSES, BFM MUST BE INSTALLED IN CONJUNCTION WITH SEEDED EROSION CONTROL VEGETATION.
- A LETTER FROM THE HYDROSEED CONTRACTOR CERTIFYING THAT THE BFM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED APPLICATION RATES AND COVERAGE REQUIREMENTS SHALL BE SUBMITTED TO THE COUNTY INSPECTOR FOR APPROVAL.

SEWER LATERAL CONSTRUCTION NOTES:

1. THE APPLICANT/OWNER PROPOSING TO CONNECT TO SAN DIEGO COUNTY SANITATION DISTRICT (DISTRICT) SEWER SYSTEM SHALL OBTAIN A RESIDENTIAL WASTEWATER DISCHARGE PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS. THE APPLICANT/OWNER SHALL MAKE A WRITTEN APPLICATION TO WASTEWATER MANAGEMENT THROUGH DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES (BUILDING PERMIT COUNTER). FOR INFORMATION, CONTACT THE WASTEWATER MANAGEMENT COUNTER AT 858-495-5717.
2. THE CONNECTION (SADDLE ONLY) TO THE DISTRICT SEWER SHALL BE INSTALLED BY DISTRICT PERSONNEL ONLY (FOR FIELD COORDINATION, CONTACT DISTRICT FIELD OFFICE AT 619-660-2007). ALL COSTS ASSOCIATED WITH PERMITS AND CONSTRUCTION OF THE SEWER LATERAL SHALL BE BORNE BY THE PROPERTY OWNER.
3. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NO PRIVATE RESIDENCES ARE SUBJECT TO A SEWAGE BACKUP OR SPILL DURING SEWER LATERAL CONNECTION.
4. THE CONTRACTOR SHALL BE LIABLE FOR ALL CLEANUP, DAMAGES, AND RESULTANT FINES IN THE EVENT OF A SEWAGE SPILL.
5. ALL SEWER LATERAL RELATED WORK SHALL CONFORM TO SAN DIEGO REGIONAL STANDARD DRAWINGS SP-01, SS-01 OR SS-02, SS-03, SS-0 4 AND SC-01 (TYPE B).
6. THE PRIVATE SEWER LATERAL CONNECTION AND CLEANOUT AT THE PROPERTY LINE IS TO BE INSPECTED AND APPROVED BY THE DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES BUILDING DIVISION.
7. EACH LOT WILL BE SERVED BY A FOUR (4) INCH DIAMETER MINIMUM SIZE PVC SEWER LATERAL. LOCATION OF SEWER LATERAL AS-CONSTRUCTED WITH STATIONS SHALL BE SHOWN ON THESE PLANS BY THE ENGINEER OF WORK PRIOR TO "RECORD PLAN" APPROVAL BY THE DISTRICT.
8. THE PROPOSED SEWER LATERAL(S) WILL BE CONSTRUCTED TO GRAVITY FLOW WITHIN THE EXISTING COUNTY ROAD RIGHT-OF-WAY.

BIOFILTRATION BASIN MEDIA

PER COUNTY OF SAN DIEGO 2014 LID HANDBOOK, APPENDIX C – FACT SHEETS.

3" MULCH LAYER (MANDATORY)
A MINIMUM OF 3 INCHES OF WELL-AGED, SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS IS PROVIDED. MULCH MUST BE NON-FLOATING TO AVOID CLOGGING OF OVERFLOW STRUCTURE.

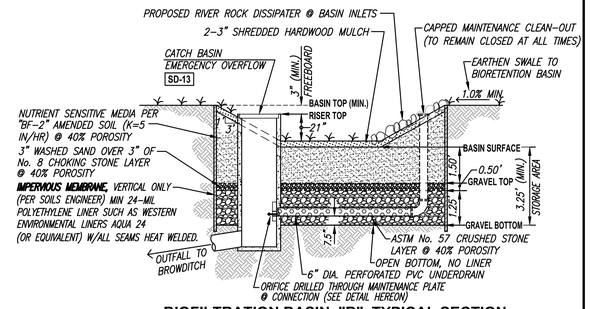
18" AMENDED SOIL LAYER
COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD (1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

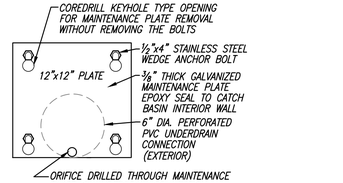
DRAINAGE LAYER
SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 3 INCHES OF WASHED SAND (ASTM NO. 33), FOLLOWED BY 3 INCHES OF CHOKING STONE (ASTM NO. 8), OVER A 1.25-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION
AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.



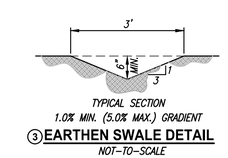
BIOFILTRATION BASIN "B" TYPICAL SECTION

TYPICAL DETAIL & OUTLET CONNECTION
BIOFILTRATION BASIN BF-1 & BF-2 W/NUTRIENT SENSITIVE MEDIA DESIGN
NOT-TO-SCALE



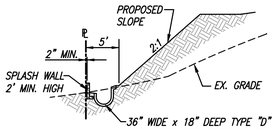
MAINTENANCE PLATE DETAIL

ATTACH TO INTERIOR INLET WALL OF CATCH BASIN



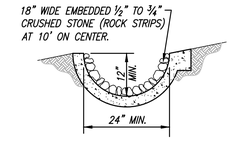
③ EARTHEN SWALE DETAIL

NOT-TO-SCALE



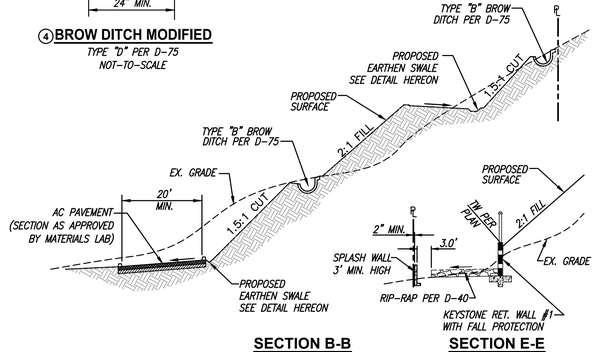
SECTION A-A

NOT TO SCALE



④ BROW DITCH MODIFIED

TYPE "D" PER D-75
NOT-TO-SCALE

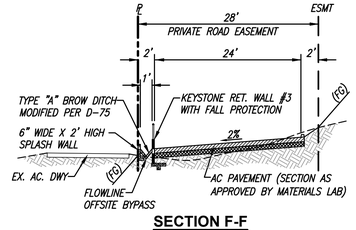


SECTION B-B

NOT TO SCALE

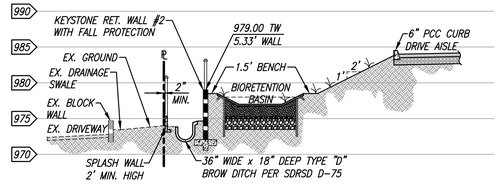
SECTION E-E

NOT TO SCALE



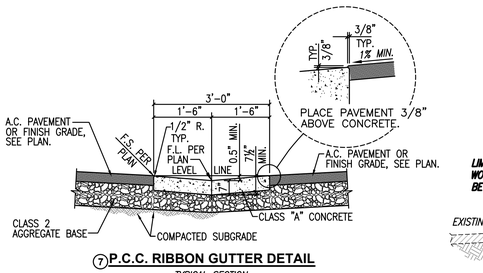
SECTION F-F

NOT TO SCALE



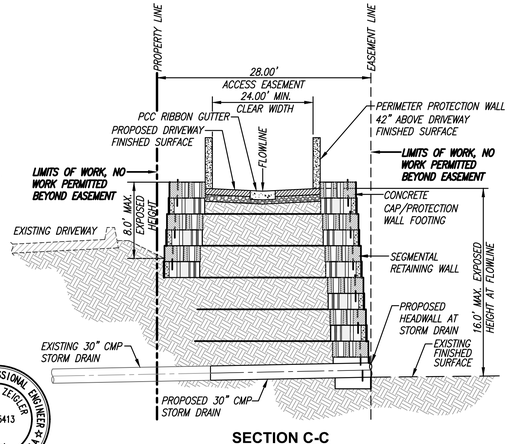
SECTION D-D

NOT TO SCALE



⑦ P.C.C. RIBBON GUTTER DETAIL

TYPICAL SECTION
NOT-TO-SCALE



SECTION C-C

DRIVEWAY RETAINING WALL SECTION
NO SCALE

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER — JOSHUA R. ZEIGLER — No. 85413 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE & COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS & PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY & NOT TO BE LIMITED TO NORMAL WORKING HOURS & CONSTRUCTION CONTRACTOR AGREES TO DEFEND, INDEMNIFY & HOLD CO. OF SAN DIEGO & DESIGN PROFESSIONAL HARMLESS FROM ANY & ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

COUNTY APPROVED CHANGES

NO.	Description	Approved by	Date

BENCH MARK

DESCRIPTION: CHISELED SQUARE
LOCATION: AT THE TOP OF PEDRAMP ON S.E. CORNER OF SIERRA LINDA DRIVE AND VISTA BONITA
RECORD FROM: #425 CITY OF ESCONDIDO BENCHMARK BOOK
ELEVATION: 504.07 DATUM: MSL

RECORD PLAN

JOSHUA R. ZEIGLER DATE
R.C.E. No: 85413
EXPIRES: 9-30-20

PRIVATE CONTRACT

SHEET 2	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	16 SHEETS

GRADING PLAN FOR:
RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER

BY: DATE

ENGINEER OF WORK: JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-20

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

"NOT FOR CONSTRUCTION"

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

PLOT DATE: 11/27/2018 8:07 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV

AD PERMIT AND GRADING PLAN NOTES:

PRE-CONSTRUCTION GRADING AND/OR IMPROVEMENTS: (PRIOR TO ANY CLEARING, GRUBBING, TRENCHING, GRADING, OR ANY LAND DISTURBANCES.)

(CULTURAL RESOURCES)

CULT#GR-1 ARCHAEOLOGICAL MONITORING – PRECONSTRUCTION MEETING [PDS, FEE X2]
INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR SIGNIFICANCE – CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE COUNTY APPROVED PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL ATTEND THE PRE-CONSTRUCTION MEETING WITH THE CONTRACTORS TO EXPLAIN AND COORDINATE THE REQUIREMENTS OF THE ARCHAEOLOGICAL MONITORING PROGRAM. THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL MONITOR THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS IN ALL AREAS IDENTIFIED FOR DEVELOPMENT INCLUDING OFF-SITE IMPROVEMENTS. THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL ALSO EVALUATE FILL SOILS TO ENSURE THAT THEY ARE CLEAN OF CULTURAL RESOURCES. THE ARCHAEOLOGICAL MONITORING PROGRAM SHALL COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES. **DOCUMENTATION:** THE APPLICANT SHALL HAVE THE CONTRACTED PROJECT ARCHEOLOGIST AND KUMEYAAY NATIVE AMERICAN ATTEND THE PRECONSTRUCTION MEETING TO EXPLAIN THE MONITORING REQUIREMENTS. **TIMING:** PRIOR TO ANY CLEARING, GRUBBING, TRENCHING, GRADING, OR ANY LAND DISTURBANCES THIS CONDITION SHALL BE COMPLETED. **MONITORING:** THE [DPW, PDCI] SHALL CONFIRM THE ATTENDANCE OF THE APPROVED PROJECT ARCHAEOLOGIST.

DURING CONSTRUCTION: (THE FOLLOWING ACTIONS SHALL OCCUR THROUGHOUT THE DURATION OF THE GRADING CONSTRUCTION).

(CULTURAL RESOURCES)

CULT#GR-2 ARCHAEOLOGICAL MONITORING – DURING CONSTRUCTION [PDS, FEE X2]
INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, A CULTURAL RESOURCE GRADING MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL MONITOR THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS IN ALL AREAS IDENTIFIED FOR DEVELOPMENT INCLUDING OFF-SITE IMPROVEMENTS. THE ARCHAEOLOGICAL MONITORING PROGRAM SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS DURING EARTH-DISTURBING ACTIVITIES:

a. DURING THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS, THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL BE ONSITE AS DETERMINED NECESSARY BY THE PROJECT ARCHAEOLOGIST. INSPECTIONS WILL VARY BASED ON THE RATE OF EXCAVATION, THE MATERIALS EXCAVATED, AND THE PRESENCE AND ABUNDANCE OF ARTIFACTS AND FEATURES. THE FREQUENCY AND LOCATION OF INSPECTIONS WILL BE DETERMINED BY THE PROJECT ARCHAEOLOGIST IN CONSULTATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR. MONITORING OF CUTTING OF PREVIOUSLY DISTURBED DEPOSITS WILL BE DETERMINED BY THE PROJECT ARCHAEOLOGIST IN CONSULTATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR.

b. IN THE EVENT THAT PREVIOUSLY UNIDENTIFIED POTENTIALLY SIGNIFICANT CULTURAL RESOURCES ARE DISCOVERED:

1. THE PROJECT ARCHAEOLOGIST OR THE KUMEYAAY NATIVE AMERICAN MONITOR SHALL HAVE THE AUTHORITY TO DIVERT OR TEMPORARILY HALT GROUND DISTURBANCE OPERATIONS IN THE AREA OF DISCOVERY TO ALLOW EVALUATION OF POTENTIALLY SIGNIFICANT CULTURAL RESOURCES.

2. THE PROJECT ARCHAEOLOGIST, IN CONSULTATION WITH THE PDS STAFF ARCHAEOLOGIST AND THE KUMEYAAY NATIVE AMERICAN MONITOR, SHALL DETERMINE THE SIGNIFICANCE OF THE DISCOVERED RESOURCES.

3. CONSTRUCTION ACTIVITIES WILL BE ALLOWED TO RESUME IN THE AFFECTED AREA ONLY AFTER THE PDS STAFF ARCHAEOLOGIST HAS CONCURRED WITH THE EVALUATION.

4. ISOLATES AND CLEARLY NON-SIGNIFICANT DEPOSITS SHALL BE MINIMALLY DOCUMENTED IN THE FIELD. SHOULD THE ISOLATES AND/OR NON-SIGNIFICANT DEPOSITS NOT BE COLLECTED BY THE PROJECT ARCHAEOLOGIST, THEN THE KUMEYAAY NATIVE AMERICAN MONITOR MAY COLLECT THE CULTURAL MATERIAL FOR TRANSFER TO A TRIBAL CURATION FACILITY OR REPATRIATION PROGRAM.

5. A RESEARCH DESIGN AND DATA RECOVERY PROGRAM (PROGRAM) IS REQUIRED TO MITIGATE IMPACTS TO IDENTIFIED SIGNIFICANT CULTURAL RESOURCES. THE PROGRAM SHALL INCLUDE (1) REASONABLE EFFORTS TO PRESERVE (AVOIDANCE) "UNIQUE" CULTURAL RESOURCES OR SACRED SITES; (2) THE CAPPING OF IDENTIFIED SACRED SITES OR UNIQUE CULTURAL RESOURCES AND PLACEMENT OF DEVELOPMENT OVER THE CAP, IF AVOIDANCE IS INFEASIBLE; AND (3) DATA RECOVERY FOR NON-UNIQUE CULTURAL RESOURCES. THE PREFERRED OPTION IS PRESERVATION (AVOIDANCE).

6. THE RESEARCH DESIGN AND DATA RECOVERY PROGRAM SHALL BE PREPARED BY THE PROJECT ARCHAEOLOGIST IN COORDINATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR.

7. THE COUNTY ARCHAEOLOGIST SHALL REVIEW AND APPROVE THE PROGRAM, WHICH SHALL BE CARRIED OUT USING PROFESSIONAL ARCHAEOLOGICAL METHODS.

AD PERMIT AND GRADING PLAN NOTES CONTINUED:

c. IF ANY HUMAN REMAINS ARE DISCOVERED:

1. THE PROPERTY OWNER OR THEIR REPRESENTATIVE SHALL CONTACT THE COUNTY CORONER AND THE PDS STAFF ARCHAEOLOGIST.

2. UPON IDENTIFICATION OF HUMAN REMAINS, NO FURTHER DISTURBANCE SHALL OCCUR IN THE AREA OF THE FIND UNTIL THE COUNTY CORONER HAS MADE THE NECESSARY FINDINGS AS TO ORIGIN.

3. IF THE REMAINS ARE DETERMINED TO BE OF NATIVE AMERICAN ORIGIN, THE MOST LIKELY DESCENDANT (MLD), AS IDENTIFIED BY THE NATIVE AMERICAN HERITAGE COMMISSION (NAHC), SHALL BE CONTACTED BY THE PROPERTY OWNER OR THEIR REPRESENTATIVE IN ORDER TO DETERMINE PROPER TREATMENT AND DISPOSITION OF THE REMAINS.

4. THE IMMEDIATE VICINITY WHERE THE NATIVE AMERICAN HUMAN REMAINS ARE LOCATED IS NOT TO BE DAMAGED OR DISTURBED BY FURTHER DEVELOPMENT ACTIVITY UNTIL CONSULTATION WITH THE MLD REGARDING THEIR RECOMMENDATIONS AS REQUIRED BY PUBLIC RESOURCES CODE SECTION 5097.98 HAS BEEN CONDUCTED.

5. PUBLIC RESOURCES CODE §5097.98, CEQA §15064.5 AND HEALTH & SAFETY CODE §7050.5 SHALL BE FOLLOWED IN THE EVENT THAT HUMAN REMAINS ARE DISCOVERED.

DOCUMENTATION: THE APPLICANT SHALL IMPLEMENT THE ARCHAEOLOGICAL MONITORING PROGRAM PURSUANT TO THIS CONDITION. **TIMING:** THE FOLLOWING ACTIONS SHALL OCCUR THROUGHOUT THE DURATION OF THE EARTH DISTURBING ACTIVITIES. **MONITORING:** THE [DPW, PDCI] SHALL MAKE SURE THAT THE PROJECT ARCHEOLOGIST IS ON-SITE PERFORMING THE MONITORING DUTIES OF THIS CONDITION. THE [DPW, PDCI] SHALL CONTACT THE [PDS, PPD] IF THE PROJECT ARCHEOLOGIST OR APPLICANT FAILS TO COMPLY WITH THIS CONDITION.

ROUGH GRADING: (PRIOR TO ROUGH GRADING APPROVAL AND ISSUANCE OF ANY BUILDING PERMIT).

(CULTURAL RESOURCES)

CULT#GR-3 ARCHAEOLOGICAL MONITORING – ROUGH GRADING [PDS, FEE] INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST SHALL PREPARE ONE OF THE FOLLOWING REPORTS UPON COMPLETION OF THE EARTH-DISTURBING ACTIVITIES THAT REQUIRE MONITORING AND COMMUNICATE WITH LOCAL TRIBES AS REQUIRED BELOW:

a. IF NO ARCHAEOLOGICAL RESOURCES ARE ENCOUNTERED DURING EARTH-DISTURBING ACTIVITIES, THEN SUBMIT A FINAL NEGATIVE MONITORING REPORT SUBSTANTIATING THAT EARTH-DISTURBING ACTIVITIES ARE COMPLETED AND NO CULTURAL RESOURCES WERE ENCOUNTERED. ARCHAEOLOGICAL MONITORING LOGS SHOWING THE DATE AND TIME THAT THE MONITOR WAS ON SITE AND ANY COMMENTS FROM THE KUMEYAAY NATIVE AMERICAN MONITOR MUST BE INCLUDED IN THE NEGATIVE MONITORING REPORT.

b. IF ARCHAEOLOGICAL RESOURCES WERE ENCOUNTERED DURING THE EARTH DISTURBING ACTIVITIES, THE PROJECT ARCHAEOLOGIST SHALL PROVIDE AN ARCHAEOLOGICAL MONITORING REPORT STATING THAT THE FIELD MONITORING ACTIVITIES HAVE BEEN COMPLETED, AND THAT RESOURCES HAVE BEEN ENCOUNTERED. THE REPORT SHALL DETAIL ALL CULTURAL ARTIFACTS AND DEPOSITS DISCOVERED DURING MONITORING AND THE ANTICIPATED TIME SCHEDULE FOR COMPLETION OF THE CURATION AND/OR REPATRIATION PHASE OF THE MONITORING.

DOCUMENTATION: THE APPLICANT SHALL SUBMIT THE ARCHAEOLOGICAL MONITORING REPORT TO THE [PDS, PPD] FOR REVIEW AND APPROVAL. ONCE APPROVED, A FINAL COPY OF THE REPORT SHALL BE SUBMITTED TO THE SOUTH COASTAL INFORMATION CENTER, THE VIEJAS BAND OF MISSION INDIANS, AND ANY CULTURALLY AFFILIATED TRIBE THAT REQUESTS A COPY OF THE REPORT. **TIMING:** UPON COMPLETION OF ALL EARTH-DISTURBING ACTIVITIES, AND PRIOR TO ROUGH GRADING FINAL INSPECTION (GRADING ORDINANCE SEC 87.421.A.2), THE REPORT SHALL BE COMPLETED. **MONITORING:** THE [PDS, PPD] SHALL REVIEW THE REPORT OR FIELD MONITORING MEMO FOR COMPLIANCE WITH THE PROJECT MMRP, AND INFORM [DPW, PDCI] THAT THE REQUIREMENT IS COMPLETED.

FINAL GRADING RELEASE: (PRIOR TO ANY OCCUPANCY, FINAL GRADING RELEASE, OR USE OF THE PREMISES IN RELIANCE OF THIS PERMIT).

(CULTURAL RESOURCES)

CULT#GR-4 ARCHAEOLOGICAL MONITORING – FINAL GRADING [PDS, FEE] INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST SHALL PREPARE A FINAL REPORT THAT DOCUMENTS THE RESULTS, ANALYSIS, AND CONCLUSIONS OF ALL PHASES OF THE ARCHAEOLOGICAL MONITORING PROGRAM IF CULTURAL RESOURCES WERE ENCOUNTERED DURING EARTH-DISTURBING ACTIVITIES. THE REPORT AND COMMUNICATIONS SHALL INCLUDE THE FOLLOWING, IF APPLICABLE:

a. DEPARTMENT OF PARKS AND RECREATION PRIMARY AND ARCHAEOLOGICAL SITE FORMS.

b. DAILY MONITORING LOGS

c. EVIDENCE THAT THE DISPOSITION OF ALL CULTURAL MATERIALS HAS BEEN COMPLETED AS FOLLOWS:

(1) EVIDENCE THAT ALL PREHISTORIC MATERIALS COLLECTED DURING THE ARCHAEOLOGICAL MONITORING PROGRAM HAVE BEEN SUBMITTED TO A SAN DIEGO CURATION FACILITY OR A CULTURALLY AFFILIATED NATIVE AMERICAN TRIBAL CURATION FACILITY THAT MEETS FEDERAL STANDARDS PER 36 CFR PART 79, AND, THEREFORE, WOULD BE PROFESSIONALLY CURATED AND MADE AVAILABLE TO OTHER ARCHAEOLOGISTS/RESEARCHERS FOR FURTHER STUDY. THE COLLECTIONS AND ASSOCIATED RECORDS, INCLUDING TITLE, SHALL BE TRANSFERRED TO THE SAN DIEGO CURATION FACILITY OR CULTURALLY AFFILIATED NATIVE AMERICAN TRIBAL CURATION FACILITY AND SHALL BE ACCOMPANIED BY PAYMENT OF THE FEES NECESSARY FOR PERMANENT CURATION. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE CURATION FACILITY STATING THAT THE PREHISTORIC ARCHAEOLOGICAL MATERIALS HAVE BEEN RECEIVED AND THAT ALL FEES HAVE BEEN PAID.

OR

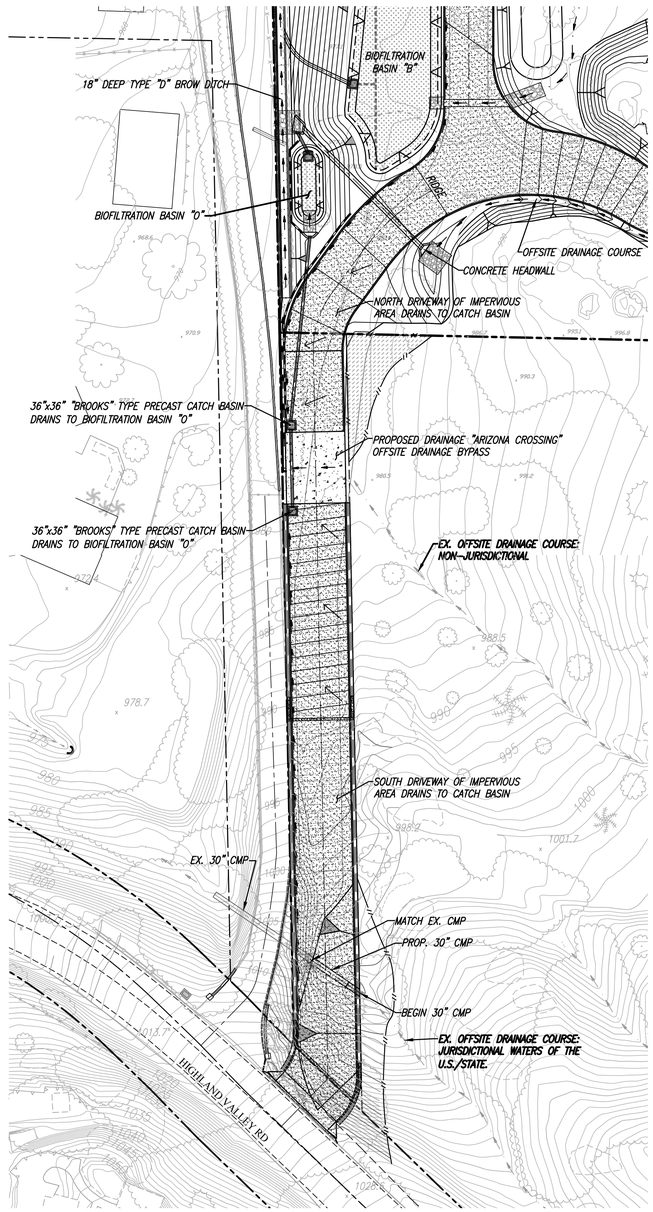
EVIDENCE THAT ALL PREHISTORIC MATERIALS COLLECTED DURING THE ARCHAEOLOGICAL MONITORING PROGRAM HAVE BEEN RETURNED TO A NATIVE AMERICAN GROUP OF APPROPRIATE TRIBAL AFFINITY. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE NATIVE AMERICAN TRIBE TO WHOM THE CULTURAL RESOURCES HAVE BEEN REPATRIATED IDENTIFYING THAT THE ARCHAEOLOGICAL MATERIALS HAVE BEEN RECEIVED.

AD PERMIT AND GRADING PLAN NOTES CONTINUED:

(2) HISTORIC MATERIALS SHALL BE CURATED AT A SAN DIEGO CURATION FACILITY AND SHALL NOT BE CURATED AT A TRIBAL CURATION FACILITY OR REPATRIATED. THE COLLECTIONS AND ASSOCIATED RECORDS, INCLUDING TITLE, SHALL BE TRANSFERRED TO THE SAN DIEGO CURATION FACILITY AND SHALL BE ACCOMPANIED BY PAYMENT OF THE FEES NECESSARY FOR PERMANENT CURATION. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE CURATION FACILITY STATING THAT THE HISTORIC MATERIALS HAVE BEEN RECEIVED AND THAT ALL FEES HAVE BEEN PAID.

d. IF NO CULTURAL RESOURCES ARE DISCOVERED, A NEGATIVE MONITORING REPORT MUST BE SUBMITTED STATING THAT THE ARCHAEOLOGICAL MONITORING ACTIVITIES HAVE BEEN COMPLETED. GRADING MONITORING LOGS MUST BE SUBMITTED WITH THE NEGATIVE MONITORING REPORT.

DOCUMENTATION: THE APPLICANT'S ARCHAEOLOGIST SHALL PREPARE THE FINAL REPORT AND SUBMIT IT TO THE [PDS, PPD] FOR APPROVAL. ONCE APPROVED, A FINAL COPY OF THE REPORT SHALL BE SUBMITTED TO THE SOUTH COASTAL INFORMATION CENTER (SCIC), THE VIEJAS BAND OF MISSION INDIANS, AND ANY CULTURALLY AFFILIATED TRIBE THAT REQUESTS A COPY OF THE REPORT. **TIMING:** PRIOR TO ANY OCCUPANCY, FINAL GRADING RELEASE, OR USE OF THE PREMISES IN RELIANCE OF THIS PERMIT, THE FINAL REPORT SHALL BE PREPARED. **MONITORING:** THE [PDS, PPD] SHALL REVIEW THE FINAL REPORT FOR COMPLIANCE WITH THIS CONDITION AND THE REPORT FORMAT GUIDELINES. UPON ACCEPTANCE OF THE REPORT, [PDS, PPD] SHALL INFORM [PDS, LDR] AND [DPW, PDCI] THAT THE REQUIREMENT IS COMPLETE AND THE BOND AMOUNT CAN BE RELINQUISHED. IF THE MONITORING WAS BONDED SEPARATELY, THEN [PDS, PPD] SHALL INFORM [PDS OR DPW FISCAL] TO RELEASE THE BOND BACK TO THE APPLICANT.



DRAIN TO BMP'S DETAIL
SCALE: 1" = 30'

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
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REGISTERED PROFESSIONAL ENGINEER – JOSHUA R. ZEIGLER – No. 85413 – CIVIL – STATE OF CALIFORNIA

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NO.	Description	Approved by	Date

BENCH MARK
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RECORD PLAN
JOSHUA R. ZEIGLER DATE
R.C.E. No: 85413
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PRIVATE CONTRACT

SHEET 3	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	16 SHEETS

GRADING PLAN FOR:
RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"
CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER
BY: DATE

ENGINEER OF WORK:
JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-20

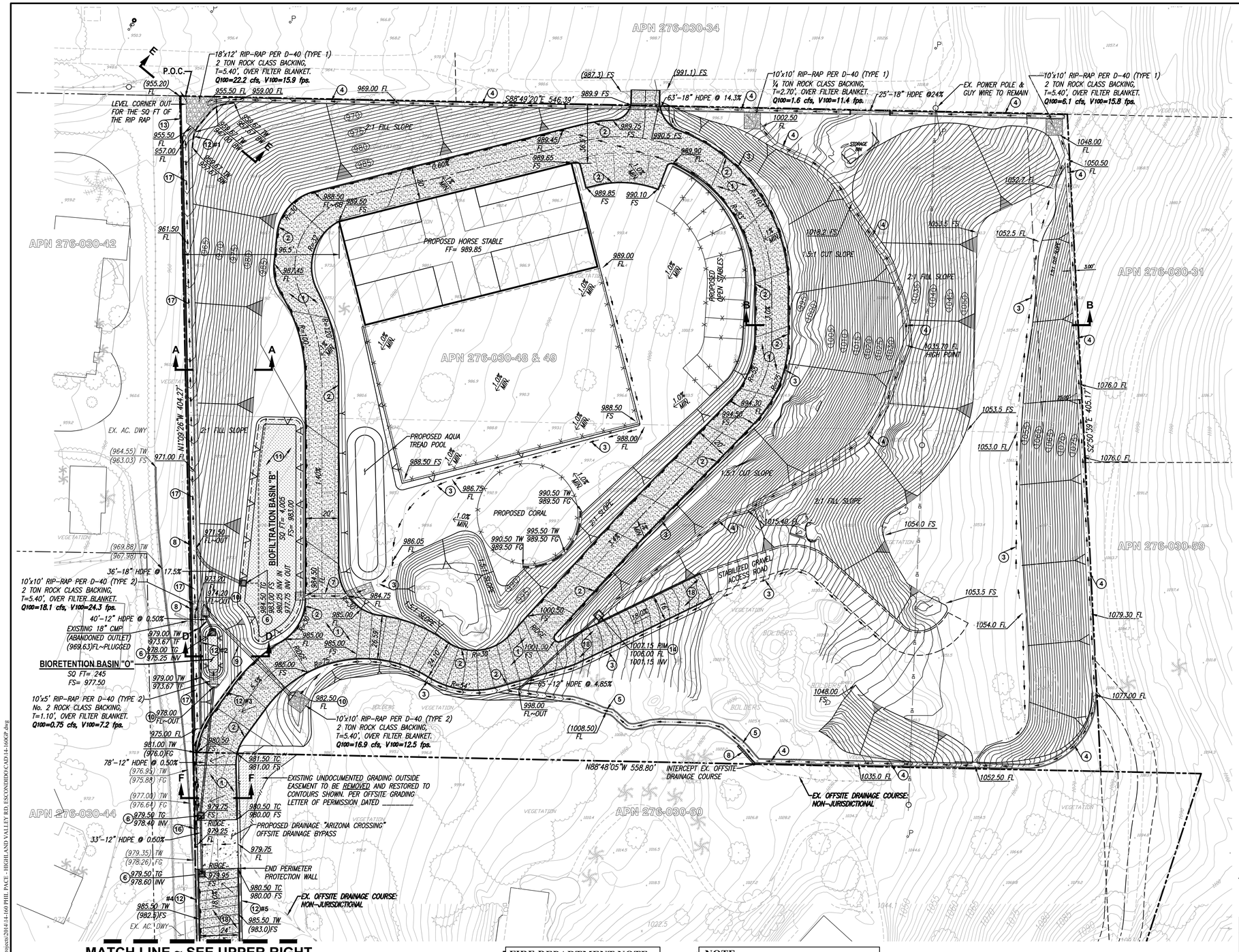
GRADING PERMIT NO: PDS2016-LDGRMJ-30067

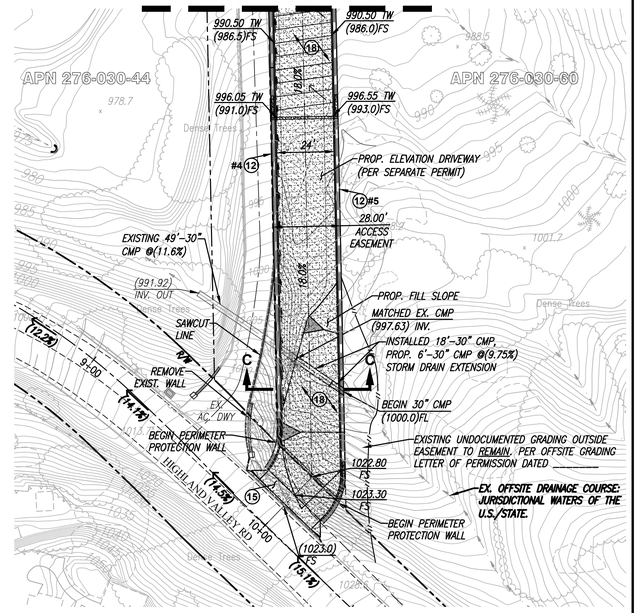
"NOT FOR CONSTRUCTION"

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

PLOT DATE: 11/27/2018 8:08 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg

SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV





CONSTRUCTION NOTES

1. CONSTRUCT 4" AC PAVEMENT OVER 8" CLASS II A.B. WITH 95% COMPACTED NATIVE. (STRUCTURAL SECTION SHALL BE AS APPROVED BY DPW MATERIAL LAB).
2. CONSTRUCT 6" AC BERM TYPE A PER SDRSD G-5.
3. EARTHEN SWALE @1.0% MIN. PER DETAIL SHEET 3.
4. CONSTRUCT 24" WIDE TYPE "B" BROW DITCH PER SDRSD D-75.
5. CONSTRUCT 36" WIDE TYPE "D" BROW DITCH PER SDRSD D-75.
6. 36"x36" "BROOKS" TYPE PRECAST CATCH BASIN.
7. CONSTRUCT 3.0' WIDE P.C.C. RIBBON GUTTER PER DETAIL SHEET 2.
8. CONSTRUCT SPLASH WALL 15' LONG x 3' MIN. HIGH AT INTERSECTIONS.
9. INSTALL 71'-24" HDPE @10.5%
10. CONSTRUCT CONCRETE HEADWALL PER SDRSD D-34.
11. CONSTRUCT BIOFILTRATION BASIN W/NUTRIENT SENSITIVE MEDIA PER "BF-2" & PER DETAIL SHEET 2.
12. CONSTRUCT KEYSTONE RETAINING WALLS PER SHEETS 6 – 16.
13. CONSTRUCT SPLASH WALL 26' LONG x 3' MIN. HIGH AT END WEST BOUNDARY.
14. CONSTRUCT TYPE 'F' CATCH BASIN PER SDRSD D-7.
15. CONSTRUCT 30' WIDE AC DRIVEWAY PER SDRSD DS-07.
16. CONSTRUST SPLASH WALL 73' LONG X 2' HIGH MIN.
17. CONSTRUCT 36" WIDE x 18" DEEP TYPE "D" BROW DITCH PER SDRSD D-75 WITH SPLASH WALL 2' MIN. HIGH ALONG WEST BOUNDARY.
18. CONSTRUCT 7" PCC PAVEMENT OVER 95% COMPACTED NATIVE, (STRUCTURAL SECTION SHALL BE AS APPROVED BY DPW MATERIAL LAB).

DPW NOTE:
ALL GRADING DETAILS WILL BE IN ACCORDANCE WITH SAN DIEGO COUNTY STANDARD DRAWINGS DS-8, DS-10, DS-11 & D-75.

30 15 0 30 60 90
SCALE: 1" = 30'

FIRE DEPARTMENT NOTE:
ACCESS ROADS EXCEEDING 15% WILL REQUIRE PORTLAND CEMENT CONCRETE WITH RAKE OR BROOM FINISH.

UTILITY NOTE:
CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. ENGINEER IS NOT RESPONSIBLE FOR PRECISE LOCATION OF EXISTING UNDERGROUND UTILITIES.

NOTE:
FOR ALL DETAILS AND SECTION SEE SHEET 2 & 3.

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APPROVED FOR:
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BY: _____ DATE

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PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
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ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

"NOT FOR CONSTRUCTION"

PLOT DATE: 11/27/2018 8:08 AM S:\Spear Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV

ATTACHMENT 6

SWMM Input Data in Input Format (Existing & Proposed Models)

SWMM INPUT

```
[TITLE]

[OPTIONS]
FLOW_UNITS           CFS
INFILTRATION         GREEN_AMPT
FLOW_ROUTING         KINWAVE
START_DATE           05/24/1951
START_TIME           00:00:00
REPORT_START_DATE    05/24/1951
REPORT_START_TIME    00:00:00
END_DATE             05/23/2008
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          01:00:00
WET_STEP             00:15:00
DRY_STEP             04:00:00
ROUTING_STEP         0:01:00
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0

[EVAPORATION]
;;Type       Parameters
;;---------- ----------
MONTHLY      0.07   0.1    0.13   0.17   0.19   0.22   0.24   0.22   0.19   0.13   0.09   0.06
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
Lake_Wholford    INTENSITY 1:00   1.0    TIMESERIES LakeWholford

[SUBCATCHMENTS]
;;                                                 Total    Pcnt.             Pcnt.    Curb
Snow
;;Name           Raingage         Outlet           Area     Imperv   Width    Slope    Length
Pack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- -
-------
Area-9a          Lake_Wholford    Area-15          0.0833   0        101      67       0
Area-8           Lake_Wholford    Area-16          0.0044   0        16       67       0
Area-15          Lake_Wholford    Area-16          0.0468   0        85       2        0
Area-6           Lake_Wholford    Area-11          0.0511   0        64       50       0
Area-16          Lake_Wholford    Area-11          0.1743   0        152      2        0
Area-12a         Lake_Wholford    Area-11          0.0259   0        23       33       0
Area-11          Lake_Wholford    Area-10          0.3574   0        111      19       0
Area-10          Lake_Wholford    Area-14          0.1530   0        51       11       0
Area-7           Lake_Wholford    Area-14          0.0134   0        32       67       0
Area-14          Lake_Wholford    POC-post         0.0129   0        22       7        0
Area-17          Lake_Wholford    Area-18          0.0248   0        40       2        0
Area-18          Lake_Wholford    Area-12b         0.2930   0        255      2        0
Area-9           Lake_Wholford    Area-12b         0.1750   0        238      67       0
Area-12b         Lake_Wholford    Area-13          0.0074   0        9        33       0
Area-3a          Lake_Wholford    Area-5a          0.0475   0        46       50       0
Area-5a          Lake_Wholford    Area-13          0.0765   0        48       50       0
Area-13          Lake_Wholford    POC-post         0.0669   0        21       23       0
Area-3b          Lake_Wholford    Area-5c          0.0197   0        43       50       0
Area-5c          Lake_Wholford    POC-post         0.0981   0        107      50       0
Area-5b          Lake_Wholford    POC-post         0.1172   0        85       50       0
Area-1           Lake_Wholford    Area-1b          0.4769   0        260      50       0
Area-1b          Lake_Wholford    POC-post         0.0702   0        340      2        0
```

```
Area-2           Lake_Wholford    POC-post         0.3660   0        228      67       0
Area-4           Lake_Wholford    POC-post         0.1144   0        125      50       0
B-a              Lake_Wholford    D                0.3703   0        190      35       0
D                Lake_Wholford    C-a              0.8188   0        185      20       0
C-a              Lake_Wholford    POC-pre          1.1823   0        190      11       0
B-b              Lake_Wholford    C-b              0.3283   0        216      35       0
C-b              Lake_Wholford    POC-pre          2.4258   0        216      13       0
C-out            Lake_Wholford    POC-pre          0.1837   0        400      3        0
D-LID1           Lake_Wholford    LID1             0.0924   0        15       5        0
C-LID1           Lake_Wholford    LID1             2.0046   34.1     210      2        0
LID1             Lake_Wholford    poc-post         0.0919   0        20       0        0
AO               Lake_Wholford    LID2             0.0550   19.7     32       3        0
Out              Lake_Wholford    LID2             0.1837   66.8     400      3        0
LID2             Lake_Wholford    POC-post         0.00559  0        10       0        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
Area-9a          0.012      0.04       0.05       0.1        25         OUTLET
Area-8           0.012      0.04       0.05       0.1        25         OUTLET
Area-15          0.012      0.04       0.05       0.1        25         OUTLET
Area-6           0.012      0.04       0.05       0.1        25         OUTLET
Area-16          0.012      0.04       0.05       0.1        25         OUTLET
Area-12a         0.012      0.04       0.05       0.1        25         OUTLET
Area-11          0.012      0.04       0.05       0.1        25         OUTLET
Area-10          0.012      0.04       0.05       0.1        25         OUTLET
Area-7           0.012      0.04       0.05       0.1        25         OUTLET
Area-14          0.012      0.04       0.05       0.1        25         OUTLET
Area-17          0.012      0.04       0.05       0.1        25         OUTLET
Area-18          0.012      0.04       0.05       0.1        25         OUTLET
Area-9           0.012      0.04       0.05       0.1        25         OUTLET
Area-12b         0.012      0.04       0.05       0.1        25         OUTLET
Area-3a          0.012      0.04       0.05       0.1        25         OUTLET
Area-5a          0.012      0.04       0.05       0.1        25         OUTLET
Area-13          0.012      0.04       0.05       0.1        25         OUTLET
Area-3b          0.012      0.04       0.05       0.1        25         OUTLET
Area-5c          0.012      0.04       0.05       0.1        25         OUTLET
Area-5b          0.012      0.04       0.05       0.1        25         OUTLET
Area-1           0.012      0.04       0.05       0.1        25         OUTLET
Area-1b          0.012      0.04       0.05       0.1        25         OUTLET
Area-2           0.012      0.04       0.05       0.1        25         OUTLET
Area-4           0.012      0.04       0.05       0.1        25         OUTLET
B-a              0.012      0.04       0.05       0.1        25         OUTLET
D                0.012      0.04       0.05       0.1        25         OUTLET
C-a              0.012      0.04       0.05       0.1        25         OUTLET
B-b              0.012      0.04       0.05       0.1        25         OUTLET
C-b              0.012      0.04       0.05       0.1        25         OUTLET
C-out            0.012      0.04       0.05       0.1        25         OUTLET
D-LID1           0.012      0.04       0.05       0.1        25         OUTLET
C-LID1           0.012      0.04       0.05       0.1        25         OUTLET
LID1             0.012      0.04       0.05       0.1        25         OUTLET
AO               0.012      0.04       0.05       0.1        25         OUTLET
Out              0.012      0.04       0.05       0.1        25         OUTLET
LID2             0.012      0.04       0.05       0.1        25         OUTLET

[INFILTRATION]
;;Subcatchment   Suction    HydCon     IMDmax
;;-------------- ---------- ---------- ----------
Area-9a          3          0.15       0.31
Area-8           9          0.01875    0.33
Area-15          3          0.15       0.31
Area-6           9          0.01875    0.33
Area-16          9          0.01875    0.33
Area-12a         3          0.2        0.31
Area-11          9          0.025      0.33
Area-10          6          0.1        0.32
Area-7           6          0.075      0.32
Area-14          6          0.075      0.32
Area-17          9          0.01875    0.33
Area-18          3          0.15       0.31
Area-9           3          0.15       0.31
```

```
Area-12b         3          0.2        0.31
Area-3a          3          0.15       0.31
Area-5a          6          0.075      0.32
Area-13          6          0.1        0.32
Area-3b          3          0.15       0.31
Area-5c          6          0.075      0.32
Area-5b          6          0.075      0.32
Area-1           6          0.075      0.32
Area-1b          6          0.075      0.32
Area-2           6          0.075      0.32
Area-4           9          0.01875    0.33
B-a              3          0.2        0.31
D                9          0.025      0.33
C-a              6          0.1        0.32
B-b              3          0.2        0.31
C-b              6          0.1        0.32
C-out            6          0.1        0.32
D-LID1           9          0.01875    0.33
C-LID1           6          0.075      0.32
LID1             6          0.075      0.32
AO               6          0.075      0.32
Out              6          0.075      0.32
LID2             6          0.075      0.32

[LID_CONTROLS]
;;               Type/Layer Parameters
;;-------------- ---------- ----------
LID-1            BC
LID-1            SURFACE    18.28      0.05       0.1        0          5
LID-1            SOIL       18         0.4        0.2        0.1        5          5          1.5
LID-1            STORAGE    21         0.67       0.103      0
LID-1            DRAIN      0.2196     0.5        7.5        6

LID-2            BC
LID-2            SURFACE    4.83       0.05       0.1        0          5
LID-2            SOIL       18         0.4        0.2        0.1        5          5          1.5
LID-2            STORAGE    18         0.67       0.738      0
LID-2            DRAIN      0          0.5        6          6

[LID_USAGE]
;;Subcatchment   LID Process      Number  Area       Width      InitSatur  FromImprv  ToPerv
Report File
;;-------------- ---------------- ------- ---------- ---------- ---------- ---------- ----------
----------
LID1             LID-1            1       4004       0          0          100        0
LID2             LID-2            1       243.6      0          0          100        0

[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate
;;-------------- ---------- ---------- ---------------- ----
POC-post         0          FREE                        NO
POC-pre          0          FREE                        NO

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
Out-1            Rating     0          0
Out-1                       1.000      0.063
Out-1                       1.083      0.212
Out-1                       1.167      0.351
Out-1                       1.250      0.435
Out-1                       1.333      0.504
Out-1                       1.417      1.160
Out-1                       1.500      2.303

Surface-1        Storage    0          10
Surface-1                   0.6666     10
Surface-1                   0.9999     10
Surface-1                   1          4004
Surface-1                   1.1667     4148
```

```
Surface-1                  1.5        4441

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
LakeWholford     FILE "L-Wohlf.txt"

[REPORT]
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 1287.606 2381.886 6519.597 7077.860
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
POC-post         3000.000           3500.000
POC-pre          6000.000           5500.000

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------

[Polygons]
;;Subcatchment   X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Area-9a          2000.000           7000.000
Area-8           1500.000           6500.000
Area-15          2000.000           6500.000
Area-6           1500.000           6000.000
Area-16          2000.000           6000.000
Area-12a         2500.000           6000.000
Area-11          2000.000           5500.000
Area-10          2000.000           5000.000
Area-7           1500.000           5000.000
Area-14          2000.000           4500.000
Area-17          3000.000           7000.000
Area-18          3000.000           6500.000
Area-9           3500.000           6000.000
Area-12b         3000.000           5500.000
Area-3a          3500.000           5500.000
Area-5a          3500.000           5000.000
Area-13          3000.000           4500.000
Area-3b          4500.000           5000.000
Area-5c          4000.000           4500.000
Area-5b          4000.000           4000.000
Area-1           1500.000           3500.000
Area-1b          2000.000           3500.000
Area-2           4000.000           3500.000
Area-4           4500.000           6000.000
B-a              5500.000           3250.000
D                5500.000           4125.000
C-a              5500.000           5000.000
B-b              6000.000           3250.000
C-b              6000.000           4562.500
C-out            6500.000           5000.000
D-LID1           1503.981           2700.000
C-LID1           3982.411           2700.000
LID1             2992.063           2697.961
AO               1500.000           4500.000
Out              1500.000           4000.000
LID2             2000.000           4000.000

[SYMBOLS]
```

```
;;Gage           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
Lake_Wholford    4883.450           6666.115
```

ATTACHMENT 7

EPA SWMM FIGURES AND EXPLANATIONS

Per the attached, the reader can see the screens associated with the EPA-SWMM Model in both pre-development and post-development conditions. Each portion, i.e., sub-catchments, outfalls, storage units, weir as a discharge, and outfalls (point of compliance), are also shown.

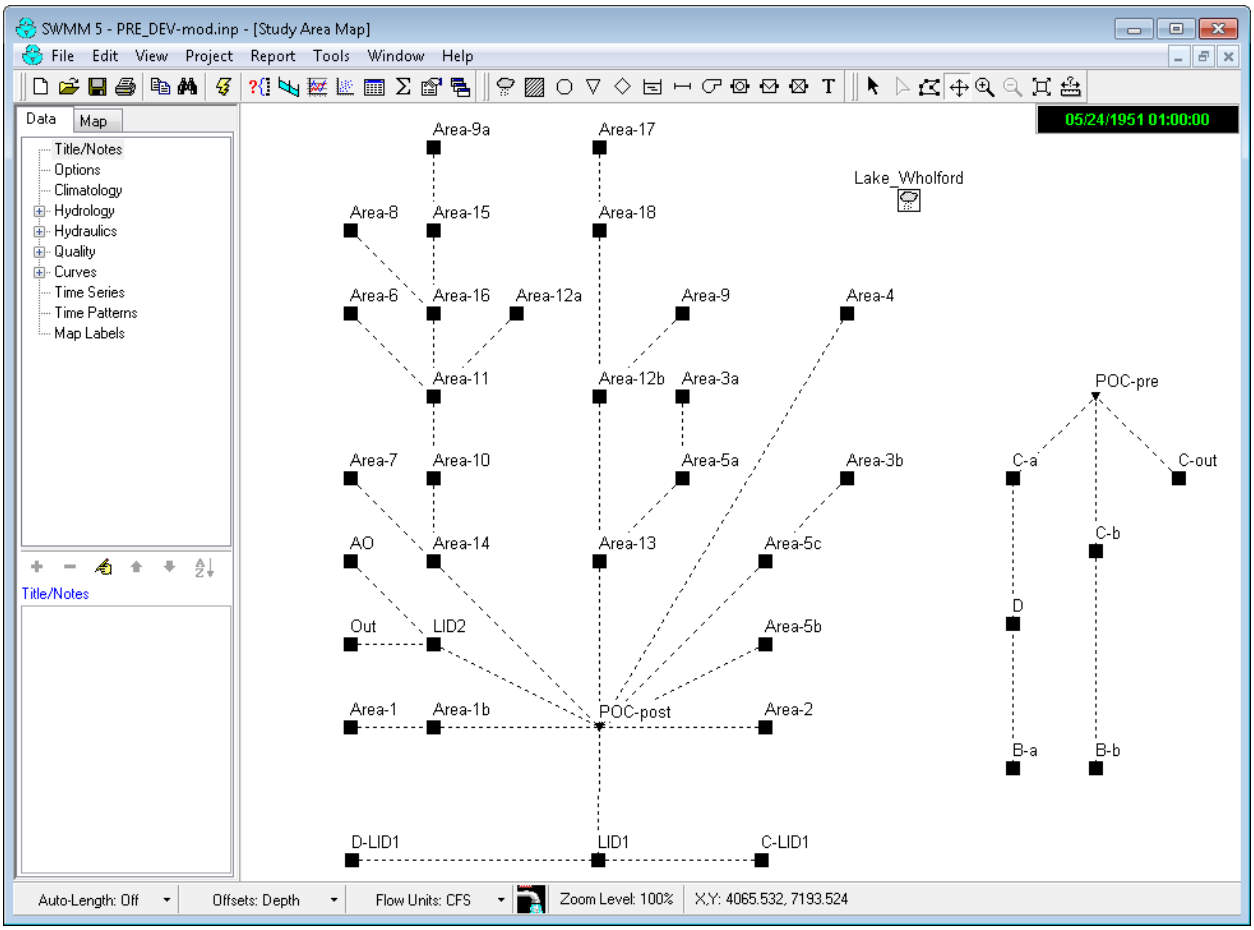
Variables for modeling are associated with typical recommended values by the EPA-SWMM model, typical values found in technical literature (such as Maidment's Handbook of Hydrology). Recommended values for the SWMM model have been attained from the interim Orange County criteria established for their SWMM calibration. Currently, no recommended values have been established by the San Diego County HMP Permit for the SWMM Model.

Soil characteristics of the existing soils were determined from the NRCS Web Soil Survey (located in Attachment 8 of this report).

Some values incorporated within the SWMM model have been determined from the professional experience of REC using conservative assumptions that have a tendency to increase the size of the needed BMP and also generate a long-term runoff as a percentage of rainfall similar to those measured in gage stations in Southern California by the USGS.

A technical document prepared by Tory R Walker Engineering for the Cities of San Marcos, Oceanside and Vista (Reference [1]) can also be consulted for additional information regarding typical values for SWMM parameters.

SWMM Model



Rain Gage Lake_Wholford

Property	Value
Name	Lake_Wholford
X-Coordinate	5271.602
Y-Coordinate	6207.314
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	LakeWholford
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC-pre

Property	Value
Name	POC-pre
X-Coordinate	6000.000
Y-Coordinate	5500.000
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment B-a

Property	Value
Name	B-a
X-Coordinate	5500.000
Y-Coordinate	3250.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	D
Area	0.3703
Width	190
% Slope	35
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment D

Property	Value
Name	D
X-Coordinate	5500.000
Y-Coordinate	4125.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	C-a
Area	0.8188
Width	185
% Slope	20
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.2
Initial Deficit	0.31

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment C-a

Property	Value
Name	C-a
X-Coordinate	5500.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-pre
Area	1.1823
Width	190
% Slope	11
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment B-b

Property	Value
Name	B-b
X-Coordinate	6000.000
Y-Coordinate	3250.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	C-b
Area	0.3283
Width	216
% Slope	35
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.1
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.2
Initial Deficit	0.31

Subcatchment C-b

Property	Value
Name	C-b
X-Coordinate	6000.000
Y-Coordinate	4562.500
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-pre
Area	2.4258
Width	216
% Slope	13
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment C-out

Property	Value
Name	C-out
X-Coordinate	6500.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-pre
Area	0.1837
Width	400
% Slope	3
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.1
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.1
Initial Deficit	0.32

Outfall POC-post

Property	Value
Name	POC-post
X-Coordinate	3000.000
Y-Coordinate	3500.000
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment Area-9a

Property	Value
Name	Area-9a
X-Coordinate	2000.000
Y-Coordinate	7000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-15
Area	0.0833
Width	101
% Slope	67
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Subcatchment Area-8

Property	Value
Name	Area-8
X-Coordinate	1500.000
Y-Coordinate	6500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-16
Area	0.0044
Width	16
% Slope	67
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-15

Property	Value
Name	Area-15
X-Coordinate	2000.000
Y-Coordinate	6500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-16
Area	0.0468
Width	85
% Slope	2
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Subcatchment Area-6

Property	Value
Name	Area-6
X-Coordinate	1500.000
Y-Coordinate	6000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-11
Area	0.0511
Width	64
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-16

Property	Value
Name	Area-16
X-Coordinate	2000.000
Y-Coordinate	6000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-11
Area	0.1743
Width	152
% Slope	2
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Subcatchment Area-12a

Property	Value
Name	Area-12a
X-Coordinate	2500.000
Y-Coordinate	6000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-11
Area	0.0259
Width	23
% Slope	33
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-11

Property	Value
Name	Area-11
X-Coordinate	2000.000
Y-Coordinate	5500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-10
Area	0.3574
Width	111
% Slope	19
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.2
Initial Deficit	0.31

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment Area-10

Property	Value
Name	Area-10
X-Coordinate	2000.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-14
Area	0.1530
Width	51
% Slope	11
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-7

Property	Value
Name	Area-7
X-Coordinate	1500.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-14
Area	0.0134
Width	32
% Slope	67
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.1
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment Area-14

Property	Value
Name	Area-14
X-Coordinate	2000.000
Y-Coordinate	4500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.0129
Width	22
% Slope	7
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-17

Property	Value
Name	Area-17
X-Coordinate	3000.000
Y-Coordinate	7000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-18
Area	0.0248
Width	40
% Slope	2
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Subcatchment Area-18

Property	Value
Name	Area-18
X-Coordinate	3000.000
Y-Coordinate	6500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-12b
Area	0.2930
Width	255
% Slope	2
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-9

Property	Value
Name	Area-9
X-Coordinate	3500.000
Y-Coordinate	6000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-12b
Area	0.1750
Width	238
% Slope	67
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Subcatchment Area-12b

Property	Value
Name	Area-12b
X-Coordinate	3000.000
Y-Coordinate	5500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-13
Area	0.0074
Width	9
% Slope	33
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-3a

Property	Value
Name	Area-3a
X-Coordinate	3500.000
Y-Coordinate	5500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-5a
Area	0.0475
Width	46
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.2
Initial Deficit	0.31

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Subcatchment Area-5a

Property	Value
Name	Area-5a
X-Coordinate	3500.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-13
Area	0.0765
Width	48
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-13

Property	Value
Name	Area-13
X-Coordinate	3000.000
Y-Coordinate	4500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.0669
Width	21
% Slope	23
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.1
Initial Deficit	0.32

Subcatchment Area-3b

Property	Value
Name	Area-3b
X-Coordinate	4500.000
Y-Coordinate	5000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-5c
Area	0.0197
Width	43
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-5c

Property	Value
Name	Area-5c
X-Coordinate	4000.000
Y-Coordinate	4500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.0981
Width	107
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	3
Conductivity	0.15
Initial Deficit	0.31

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment Area-5b

Property	Value
Name	Area-5b
X-Coordinate	4000.000
Y-Coordinate	4000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.1172
Width	85
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-1

Property	Value
Name	Area-1
X-Coordinate	1500.000
Y-Coordinate	3500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	Area-1b
Area	0.4769
Width	260
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment Area-1b

Property	Value
Name	Area-1b
X-Coordinate	2000.000
Y-Coordinate	3500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.0702
Width	340
% Slope	2
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment Area-2

Property	Value
Name	Area-2
X-Coordinate	4000.000
Y-Coordinate	3500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.3660
Width	228
% Slope	67
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment Area-4

Property	Value
Name	Area-4
X-Coordinate	4500.000
Y-Coordinate	6000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.1144
Width	125
% Slope	50
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment D-LID1

Property	Value
Name	D-LID1
X-Coordinate	1503.981
Y-Coordinate	2700.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	LID1
Area	0.0924
Width	15
% Slope	5
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.01875
Initial Deficit	0.33

Subcatchment C-LID1

Property	Value
Name	C-LID1
X-Coordinate	3982.411
Y-Coordinate	2700.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	LID1
Area	2.0046
Width	210
% Slope	2
% Imperv	34.1
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Subcatchment LID1

Property	Value
Name	LID1
X-Coordinate	2992.063
Y-Coordinate	2697.961
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	poc-post
Area	0.0919
Width	20
% Slope	0
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment AO

Property	Value
Name	AO
X-Coordinate	1500.000
Y-Coordinate	4500.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	LID2
Area	0.0550
Width	32
% Slope	3
% Imperv	19.7
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Optional category or classification

Subcatchment Out

Property	Value
Name	Out
X-Coordinate	1500.000
Y-Coordinate	4000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	LID2
Area	0.1837
Width	400
% Slope	3
% Imperv	66.8
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Optional category or classification

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

Subcatchment LID2

Property	Value
Name	LID2
X-Coordinate	2000.000
Y-Coordinate	4000.000
Description	
Tag	
Rain Gage	Lake_Wholford
Outlet	POC-post
Area	0.00559
Width	10
% Slope	0
% Imperv	0
N-Imperv	0.012
N-Perv	0.04
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Average surface slope (%)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	6
Conductivity	0.075
Initial Deficit	0.32

LID Control Editor: Explanation of Significant Variables

Storage Depth:

The storage depth variable within the SWMM model is representative of the storage volume provided beneath the first surface riser outlet and the engineered soil and mulch components of the bioretention facility.

In those cases where the surface storage has a variable area that is also different to the area of the gravel and amended soil, the SWMM model needs to be calibrated as the LID module will use the storage depth multiplied by the BMP area as the amount of volume stored at the surface.

Let A_{BMP} be the area of the BMP (area of amended soil and area of gravel). The proper value of the storage depth S_D to be included in the LID module can be calculated by using geometric properties of the surface volume. Let A_0 be the surface area at the bottom of the surface pond, and let A_i be the surface area at the elevation of the invert of the first row of orifices (or at the invert of the riser if not surface orifices are included). Finally, let h_i be the difference in elevation between A_0 and A_i. By volumetric definition:

$$A_{BMP} \cdot S_D = \frac{(A_0 + A_i)}{2} h_i \qquad (1)$$

Equation (1) allows the determination of S_D to be included as Storage Depth in the LID module.

Porosity: A porosity value of 0.4 has been selected for the model. The amended soil is to be highly sandy in content in order to have a saturated hydraulic conductivity of approximately 5 in/hr.

REC considers such a value to be slightly high; however, in order to comply with the HMP Permit, the value recommended by the Copermittees for the porosity of amended soil is 0.4, per Appendix A of the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011. Such porosity is equal to the porosity of the gravel per the same document.

Void Ratio: The ratio of the void volume divided by the soil volume is directly related to porosity as n/(1-n). As the underdrain layer is composed of gravel, a porosity value of 0.4 has been selected (also per Appendix A of the Final HMP document), which results in a void ratio of 0.4/(1-0.4) = 0.67 for the gravel detention layer.

Conductivity: Per the geotechnical documentation provided in Attachment 8 of this report, infiltration rates of 0.103 in/hr and 0.738 in/hr have been used for BMP's 1 & 2 respectively.

Clogging factor: A clogging factor was not used (0 indicates that there is no clogging assumed within the model). The reason for this is related to the fairness of a comparison with the SDHM model and the HMP sizing tables: a clogging factor was not considered, and instead, a conservative value of infiltration was recommended.

Drain (Flow) coefficient: The flow coefficient C in the SWMM Model is the coefficient needed to transform the orifice equation into a general power law equation of the form:

$$q = C(H - H_D)^n \quad (2)$$

where q is the peak flow in in/hr, n is the exponent (typically 0.5 for orifice equation), H_D is the elevation of the centroid of the orifice in inches (assumed equal to the invert of the orifice for small orifices and in our design equal to 0) and H is the depth of the water in inches.

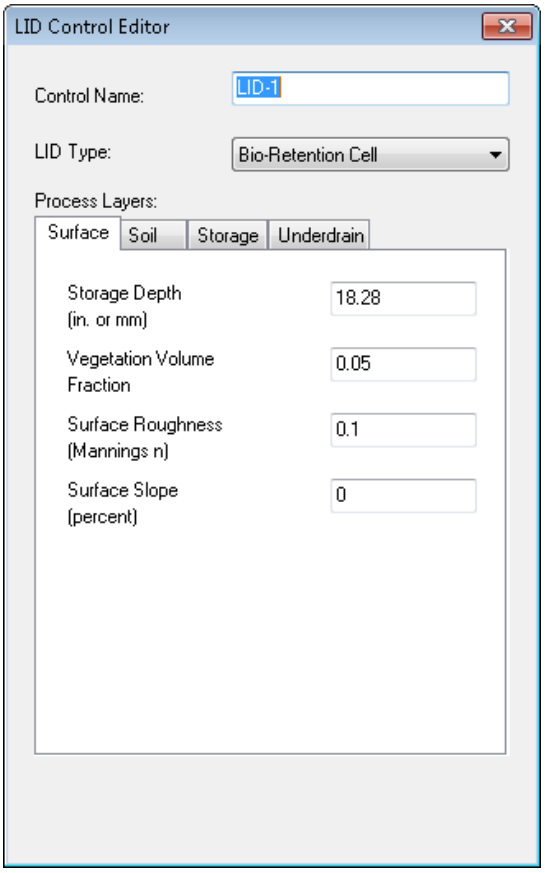
The general orifice equation can be expressed as:

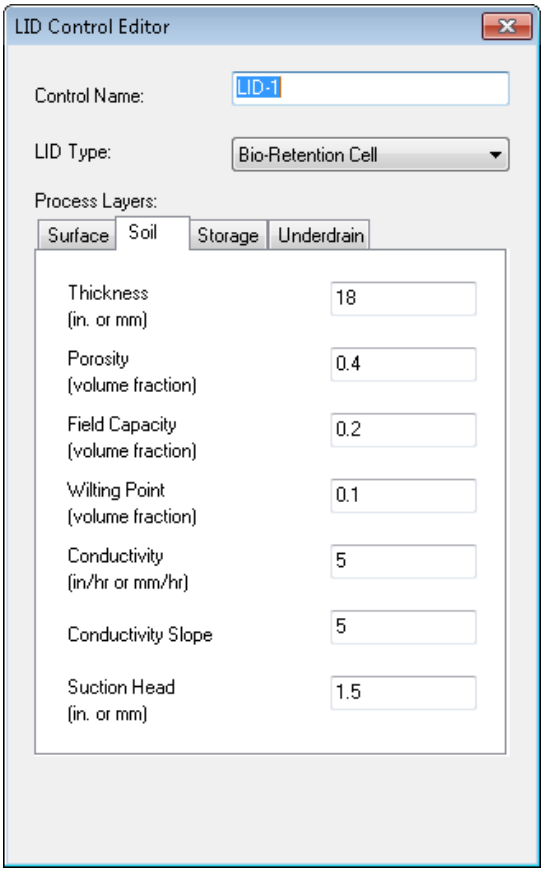
$$Q = \frac{\pi}{4} c_g \frac{D^2}{144} \sqrt{2g \frac{(H - H_D)}{12}} \quad (3)$$

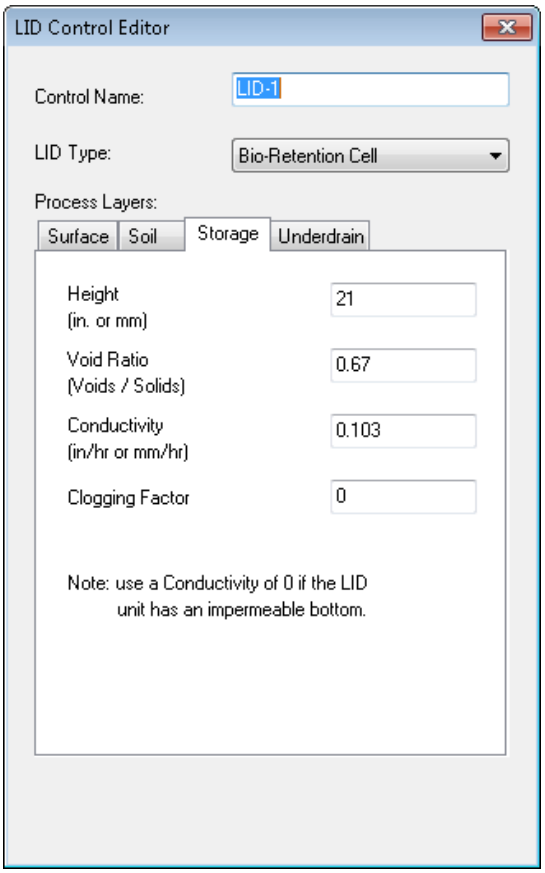
where Q is the peak flow in cfs, D is the diameter in inches, c_g is the typical discharge coefficient for orifices (0.61-0.63 for thin walls and around 0.75-0.8 for thick walls), g is the acceleration of gravity in ft/s^2, and H and H_D are defined above and are also used in inches in Equation (3).

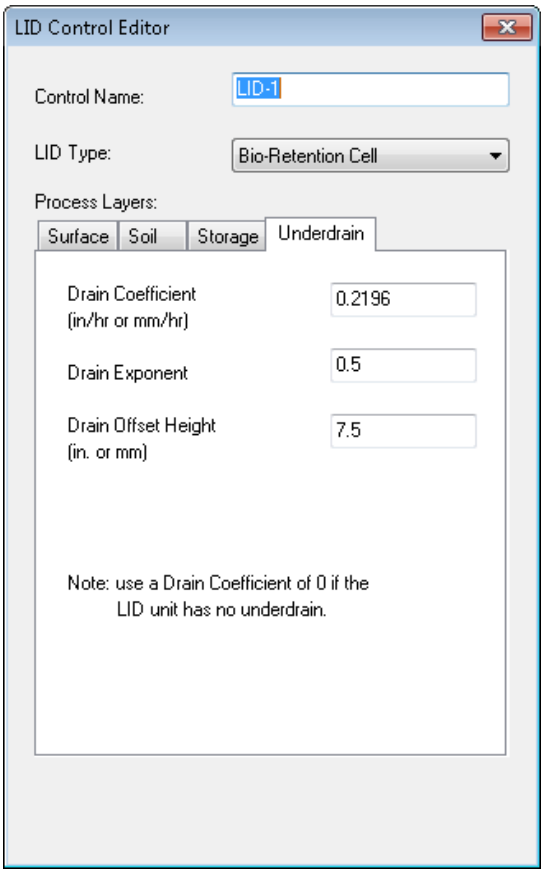
It is clear that:

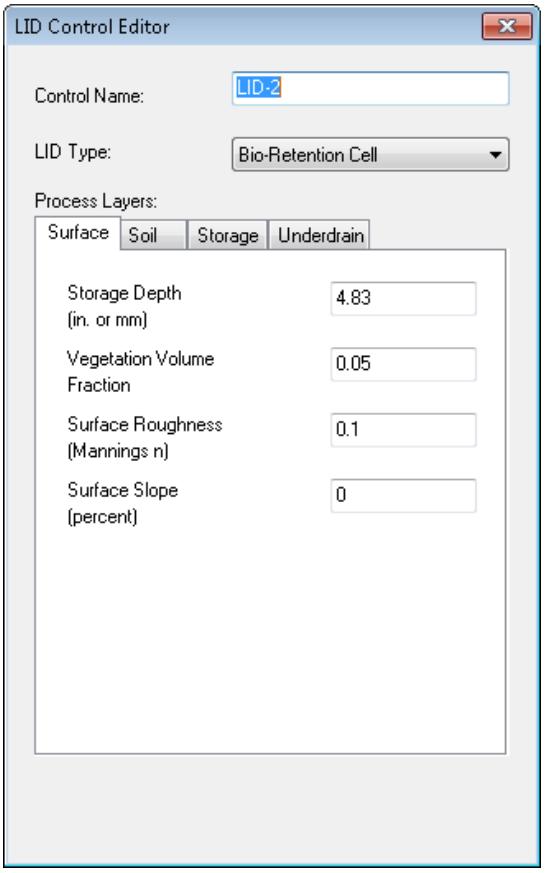
$$q \left(\frac{in}{hr}\right) X \frac{A_{BMP}}{12 \; X \; 3600} = Q \; (cfs) \quad (4)$$


LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Storage Depth
(in. or mm)
18.28
Vegetation Volume
Fraction
0.05
Surface Roughness
(Mannings n)
0.1
Surface Slope
(percent)
0


LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Thickness
(in. or mm)
18
Porosity
(volume fraction)
0.4
Field Capacity
(volume fraction)
0.2
Wilting Point
(volume fraction)
0.1
Conductivity
(in/hr or mm/hr)
5
Conductivity Slope
5
Suction Head
(in. or mm)
1.5


LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
21
Void Ratio
(Voids / Solids)
0.67
Conductivity
(in/hr or mm/hr)
0.103
Clogging Factor
0
Note: use a Conductivity of 0 if the LID
unit has an impermeable bottom.


LID Control Editor
Control Name:
LID-1
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0.2196
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
7.5
Note: use a Drain Coefficient of 0 if the
LID unit has no underdrain.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Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Storage Depth
(in. or mm)
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Vegetation Volume
Fraction
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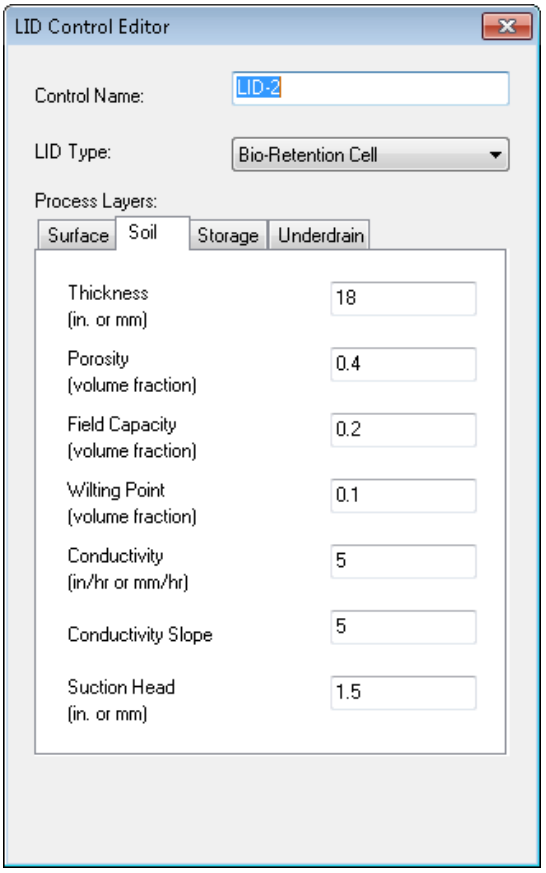
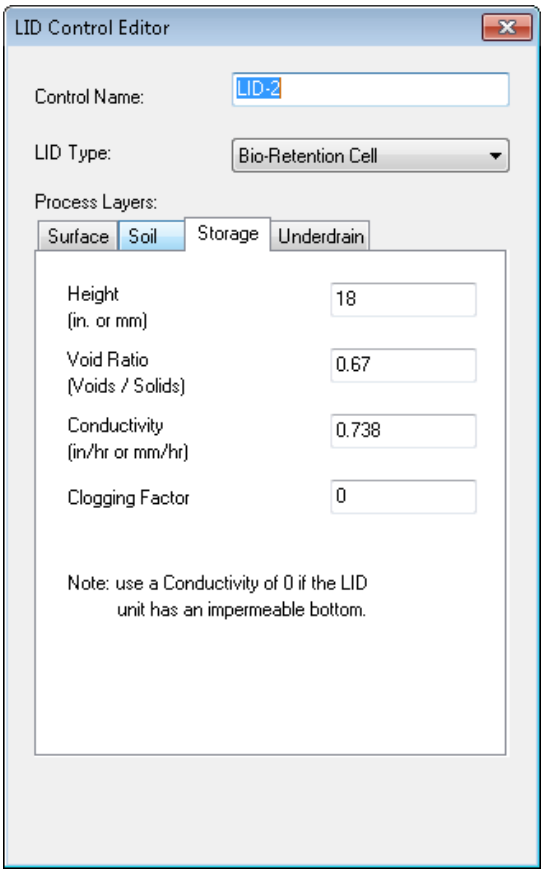
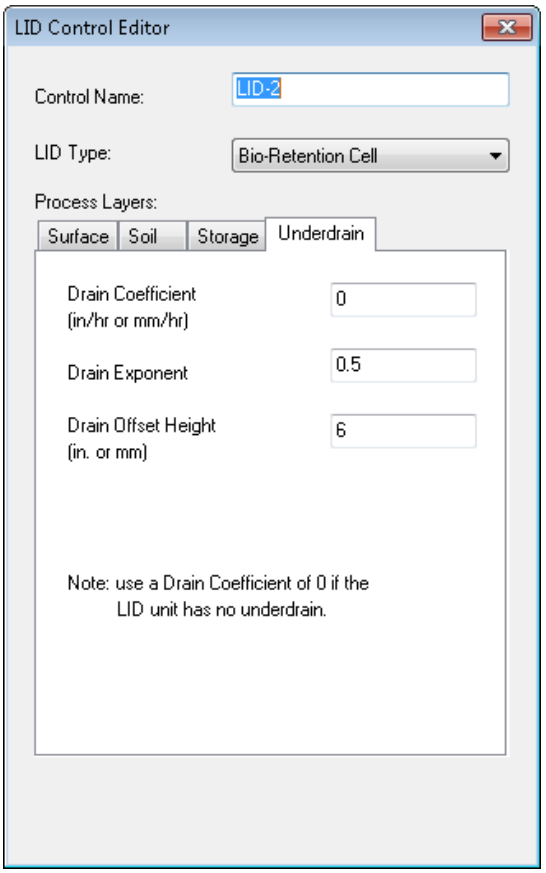
Surface Roughness
(Mannings n)
0.1
Surface Slope
(percent)
0


LID Control Editor
Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Thickness
(in. or mm)
18
Porosity
(volume fraction)
0.4
Field Capacity
(volume fraction)
0.2
Wilting Point
(volume fraction)
0.1
Conductivity
(in/hr or mm/hr)
5
Conductivity Slope
5
Suction Head
(in. or mm)
1.5


LID Control Editor
Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Height
(in. or mm)
18
Void Ratio
(Voids / Solids)
0.67
Conductivity
(in/hr or mm/hr)
0.738
Clogging Factor
0
Note: use a Conductivity of 0 if the LID
unit has an impermeable bottom.


LID Control Editor
Control Name:
LID-2
LID Type:
Bio-Retention Cell
Process Layers:
Surface
Soil
Storage
Underdrain
Drain Coefficient
(in/hr or mm/hr)
0
Drain Exponent
0.5
Drain Offset Height
(in. or mm)
6
Note: use a Drain Coefficient of 0 if the
LID unit has no underdrain.

Manning's *n* Values for Overland Flow[1]

The BMP Design Manuals within the County of San Diego allow for a land surface description other than short prairie grass to be used for hydromodification BMP design only if documentation provided is consistent with Table A.6 of the SWMM 5 User's Manual.

In January 2016, the EPA released the SWMM Reference Manual Volume I – Hydrology (SWMM Hydrology Reference Manual). The SWMM Hydrology Reference Manual complements the SWMM 5 User's Manual by providing an in-depth description of the program's hydrologic components. Table 3-5 of the SWMM Hydrology Reference Manual expounds upon Table A.6 of the SWMM 5 User's Manual by providing Manning's *n* values for additional overland flow surfaces. Therefore, in order to provide SWMM users with a wider range of land surfaces suitable for local application and to provide Copermittees with confidence in the design parameters, we recommend using the values published by Yen and Chow in Table 3-5 of the EPA SWMM Reference Manual Volume I – Hydrology. The values are provided in the table below:

Overland Surface	**Manning value (*n*)**
Smooth asphalt pavement	0.010
Smooth impervious surface	0.011
Tar and sand pavement	0.012
Concrete pavement	0.014
Rough impervious surface	0.015
Smooth bare packed soil	0.017
Moderate bare packed soil	0.025
Rough bare packed soil	0.032
Gravel soil	0.025
Mowed poor grass	0.030
Average grass, closely clipped sod	0.040
Pasture	0.040
Timberland	0.060
Dense grass	0.060
Shrubs and bushes	0.080
Land Use	
Business	0.014
Semibusiness	0.022
Industrial	0.020
Dense residential	0.025
Suburban residential	0.030
Parks and lawns	0.040

[1]Content summarized from *Improving Accuracy in Continuous Simulation Modeling: Guidance for Selecting Pervious Overland Flow Manning's n Values in the San Diego Region* (TRWE, 2016).

ATTACHMENT 8

Soils Maps & Geotechnical Report

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		N
Provide basis: Basin B: On site percolation tests resulting in calculated infiltration rate to include safety factor were less than 0.5 inches/hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	Y	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Excavations for trenches and foundations placed on the site building pad within 100 feet of Basin B should not be deeper than the bottom of the liner. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Review of Geotracker, an on line resource for known contaminated properties undergoing regulatory review, indicates the site and up surface gradient properties are not under regulatory review for a release of contaminants. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: Calculated infiltration rate is less than 0.5 inches/hour. Ephemeral or blue line streams or other drainages and water bodies do not cross the site or adjacent properties so as to be impacted by on site infiltration of storm water. The site is not contaminated so as to contribute to contamination of groundwater or surface water. Private septic systems should be no closer to Basin B than allowed by the County of San Diego Department of Environmental Health. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	Y	
Provide basis: On site percolation tests results allow a calculated infiltration rate of 0.10256 inches/hour to include as safety factor of 2 as per attached D.5-1. It is noted that the term "appreciable" is subject to regulatory interpretation. CTE presents the calculated infiltration rate as "appreciable" simply as there was a measurable water column drop sufficient to allow an infiltration rate calculation. See attached report for percolation test results and infiltration rate calculation. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	Y	
Provide basis: The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Retaining walls necessary to construct downslope Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin B. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: Soil Boring B-3 was placed within 50 feet of Basin B extended at least 10 feet below the basin filter medium did not encounter groundwater. The underlying Woodson Mountain granodiorite is a crystalline bedrock and accordingly is not considered a regional water bearing body. As such, infiltrate from Basin B is not anticipated to impact groundwater. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: CTE is unaware of water rights to be impacted by the proposed Basin B. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		Y

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.00
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.00
Combined Safety Factor, $S_{total} = S_A \times S_B$					1.0 as modified below
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					0.20513 in/hr
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.10256 in/hr
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Basin O: Minimum safety factor of 2 is assigned as per County (February 2016) guidelines. See attached report for percolation test results, calculated infiltration rates and conclusions.					

BIOINFILTRATION BASIN O

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	Y	
Provide basis: Basin O: On site percolation tests resulting in calculated infiltration rate to include safety factor were greater than 0.5 inches/hour. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	Y	
Provide basis: The basin sidewalls are planned to be equipped with an impermeable liner. As such, the potential adverse effects of utility intrusion and mounding are reduced. Retaining walls necessary to construct Basin O should be equipped with heel drains to minimize the potential adverse impacts of moisture intrusion due to infiltrate from Basin O. A perforated collection pipe should be placed near the bottom of the infiltrate section of Basin O to reduced the potential for "rising water" at the toe of slope and down topography properties. Slope stability calculations provided in CTE report "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch..." dated October 5, 2016 indicates the slope has a calculated static safety factor in excess of 1.5 which meets County of San Diego requirements. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: Review of Geotracker, an on line resource for known contaminated properties undergoing regulatory review, indicates the site and up surface gradient properties are not under regulatory review for a release of contaminants. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	Y	
Provide basis: Ephemeral or blue line streams or other drainages and water bodies do not cross the site or adjacent properties so as to be impacted by on site infiltration of storm water. The site is not contaminated so as to contribute to contamination of groundwater or surface water. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		Y

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		Y

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

Worksheet D.5-1: Factor of Safety and Design Infiltration Rate Worksheet

Factor of Safety and Design Infiltration Rate Worksheet			Worksheet D.5-1		
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	3	0.75
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.75
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	1	0.25
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.00
Combined Safety Factor, $S_{total} = S_A \times S_B$					1.75 as modified below
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					1.47541 in/hr
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					0.73770 in/hr
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: Basin O: Minimum safety factor of 2 is assigned as per County (February 2016) guidelines. See attached report for percolation test results, calculated infiltration rates and conclusions.					

ATTACHMENT 9

Summary Files from the SWMM Model

PRE_DEV POC-1

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date MAY-24-1951 00:00:00
Ending Date MAY-23-2008 23:00:00
Antecedent Dry Days 0.0
Report Time Step 01:00:00
Wet Time Step 00:15:00
Dry Time Step 04:00:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	864.434	976.900
Evaporation Loss	28.819	32.568
Infiltration Loss	728.738	823.550
Surface Runoff	111.791	126.335
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.569	

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	111.788	36.428
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	111.788	36.428
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
Area-9a	976.90	0.00	5.62	915.70	62.07	0.14	0.09	0.064
Area-8	976.90	0.00	41.73	645.54	313.47	0.04	0.01	0.321
Area-15	976.90	110.47	5.83	921.94	165.21	0.21	0.13	0.152
Area-6	976.90	0.00	41.90	646.81	310.77	0.43	0.06	0.318
Area-16	976.90	52.27	42.53	651.03	350.86	1.66	0.35	0.341
Area-12a	976.90	0.00	2.68	941.39	36.15	0.03	0.02	0.037
Area-11	976.90	218.16	34.57	714.84	458.97	4.45	0.85	0.384
Area-10	976.90	1072.14	14.62	992.31	1062.70	4.41	0.94	0.519
Area-7	976.90	0.00	11.57	863.36	111.19	0.04	0.02	0.114
Area-14	976.90	12719.59	16.19	943.62	12777.76	4.48	0.95	0.933

Area-17	976.90	0.00	42.22	648.77	303.67	0.20	0.03	0.311
Area-18	976.90	25.70	6.06	931.03	70.14	0.56	0.34	0.070
Area-9	976.90	0.00	5.61	915.63	62.31	0.30	0.18	0.064
Area-12b	976.90	4250.86	3.42	963.64	4275.84	0.86	0.51	0.818
Area-3a	976.90	0.00	5.63	916.01	61.55	0.08	0.05	0.063
Area-5a	976.90	38.21	11.72	866.32	144.97	0.30	0.14	0.143
Area-13	976.90	638.73	9.40	892.14	721.93	1.31	0.68	0.447
Area-3b	976.90	0.00	5.60	915.41	62.46	0.03	0.02	0.064
Area-5c	976.90	12.54	11.66	864.90	121.40	0.32	0.13	0.123
Area-5b	976.90	0.00	11.63	864.51	109.22	0.35	0.14	0.112
Area-1	976.90	0.00	11.65	864.78	108.50	1.41	0.56	0.111
Area-1b	976.90	737.12	12.01	871.12	840.48	1.60	0.63	0.490
Area-2	976.90	0.00	11.64	864.51	109.17	1.08	0.43	0.112
Area-4	976.90	0.00	41.94	646.97	309.98	0.96	0.14	0.317
B-a	976.90	0.00	2.69	941.78	35.70	0.36	0.35	0.037
D	976.90	16.15	33.71	708.35	262.20	5.83	1.35	0.264
C-a	976.90	181.58	11.38	922.31	230.94	7.41	2.62	0.199
B-b	976.90	0.00	2.69	941.58	35.96	0.32	0.31	0.037
C-b	976.90	4.87	9.05	883.76	91.95	6.06	2.98	0.094
C-out	976.90	0.00	8.76	878.06	96.70	0.48	0.20	0.099
D-LID1	976.90	0.00	43.24	655.91	289.33	0.73	0.12	0.296
C-LID1	976.90	0.00	55.32	574.63	353.74	19.25	2.44	0.362
LID1	976.90	8007.01	983.05	3331.19	4557.14	11.37	1.55	0.507
AO	976.90	0.00	35.48	695.74	254.08	0.38	0.07	0.260
Out	976.90	0.00	92.11	286.76	613.20	3.06	0.23	0.628
LID2	976.90	22651.02	1074.01	14976.82	6541.33	0.99	0.28	0.277

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Pcnt. Error
LID1	LID-1	8983.91	982.88	3330.62	403.60	4152.75	0.00	0.00	1.27
LID2	LID-2	23627.92	1073.61	14971.24	6538.89	0.00	0.00	0.00	4.42

Analysis begun on: Mon Apr 24 15:06:39 2017
Analysis ended on: Mon Apr 24 15:07:22 2017
Total elapsed time: 00:00:43

ATTACHMENT 10

Response to Comments

Response to Comments dated August 8, 2016: SWMM Comments

Second Review Submittal, New Comment: SWMM Model: Existing Condition Model Input Parameter N-Perv value of 0.06 used. This project is a new development project and pre-project condition shall be modeled as undisturbed vegetated area. Use N-Perv value of 0.1.

Response: A revised Manning's value of 0.04 has been used in accordance with the County's Handout #2: Manning's "n" Values for Overland Flow Using EPA SWMM V.5. Reference is provided within the revised study.

Second Review Submittal, New Comment: SWMM Model: The SWMM Model uses ponding depths of 10.75 inches for Basin B and 4.83 for Basin O. The Sizing Calculations and details indicate a ponding depth of 12 inches for Basin B and 6 inches are for Basin O. Please revise the SWMM Model or Sizing Factor Calculations as appropriate to use a single ponding depth for each proposed biofiltration basin.

Response: The SWMM model ponded depths are effective depths as discussed within Attachment 7 of the HMP report. Please refer to Attachment 7 for further information in regards to how these depths were calculated. As the area at surface level is not constant but the area in the LID module is constant, the effective depth (the depth that multiplied by the LID area is equal to the real surface volume) is used.

Second Review Submittal, New Comment: SWMM Model: An Infiltration rate of 0.075 is used for the native soil in the SWMM Model. This value is not supported by the geotechnical report. Final design of structural BMPs must be based on the project site-specific infiltration rate, and Worksheet D.5-1 must be completed to determine the design infiltration rate, which in turn requires that a project geotechnical investigation be performed in accordance with Appendix C and D of the BMP DM.

Response: The infiltration rates have been revised in accordance with the onsite infiltration study undertaken for the project site. The geotechnical document is provided in Attachment 8.

TECHNICAL MEMORANDUM:

Demonstration of No Net Impact To Critical Coarse Sediment Yield for:

ResQue Ranch

Prepared For:

Spear & Associates

July 27, 2016. Reviewed: April 24, 2017.

Prepared by:

Luis Parra, PhD, CPSWQ, ToR, D.WRE.
R.C.E. 66377

REC Consultants
2442 Second Avenue
San Diego, CA 92101
Telephone: (619) 232-9200

TECHNICAL MEMORANDUM :
DEMONSTRATION OF NO NET IMPACT TO CCSY

TO: Josh Zeigler, Vice President
Spears & Associates, Inc.

FROM: Luis Parra, PhD, PE, CPSWQ, ToR, D.WRE.

DATE: July 27, 2016. Reviewed: September 13, 2016. April 24, 2017.

RE: Summary of No Net Impact on Critical Coarse Sediment Yield for ResQue Ranch, San Diego County, CA.

INTRODUCTION

The purpose of this Technical Memorandum is to demonstrate that ResQue Ranch development will generate No Net Impact in the Critical Sediment Yield to the POC, in agreement with the No Net Impact Methodology explained in Appendix H of the February 2016 BMP Design Manual, San Diego County. No net impact will be achieved by equilibrating two different components: (a) the discharges of the sediment producing areas will be diverted as recommended in this analysis to adjust the Sediment Production S_P as close as possible to the original conditions and (b) the discharges of the developed areas will be adjusted by designing BMPs such that the work exercised by the discharged flows (the Erosion Potential E_P) is as close as possible to the pre-development work. By working simultaneously on those to factors (S_P and E_P) the project will achieve compliance as any reduction in the dimensionless Sediment Production Coefficient S_P will be compensated by similar reduction in the Erosion Potential Coefficient E_P so that no overall net impact downstream is achieved ($E_P/S_P \leq 1.1$).

IDENTIFICATION OF CCSYAs AND REFINEMENT METHODS

The ResQue project initiated grading operations without the proper permitting process in place. As a consequence, many alternatives of refinement valid to deal with CCSYAs are no longer available. The project cannot longer use RPO method, Depositional Analysis, Threshold Channel Analysis, and Coarse Sediment Source Area Verification as the characteristics of the CCSYAs have been altered by the grading process.

The only “after the fact” option available is to demonstrate no net impact by: (a) diverting the runoff from the few natural areas not graded into the POC to account for the naturally-occurring critical coarse sediment yield (sub-areas 10, 11, 12a, 12b and 13, see Appendix 1), (b) diverting the runoff from as many as possible of the slopes areas (both cut slopes and fill slopes, see sub-areas 2, 3, 3b, 4, 5a, 5b, 5c, 6, 8, 9, and 9a in Appendix 1) to compensate for the reduction of critical coarse sediment yield and (c) design the hydromodification BMPs in such a way that not only they are hydromodification compliant, but also the discharge flows end up reducing the amount of work and transport capacity of the runoff to levels compatible with the critical coarse sediment yield reduction.

NO NET IMPACT ANALYIS

Verification of Geomorphic Landscape Units (GLUs)

As an initial step, GLU areas will be mapped to determine the original critical coarse sediment yield of the CCSYAs in the project. Appendix 2 shows the GIS results of the property combined with a Geology Map. It is clear from this analysis that (a) the dominant land use of the original property is agricultural per Table H.6.2-2 (see Appendix 2), (b) the geologic units are Coarse Bedrock per Table H.6.2-1 (see Appendix 2), and (c) only areas with slopes larger than 20% have a high sediment production (slope categories 3 and 4). Therefore, a slope analysis is needed to determine the amount of area of those categories.

A slope analysis is included in Appendix 1. The result of the slope analysis is included in Table 1, for both pre-development conditions, and post-development condition (only for the portion of the post-development conditions that remains natural). Slope of cut and fill sloped areas is self-evident (cut 1.5:1 and fill 2:1) and those areas are also considered in the sediment production of the post-development conditions.

TABLE 1 – SUMMARY OF SLOPE ANALYSIS

Slope	Pre-Development Area, A (acres)	Post-Development Area, A (acres)
0-10%	0.347	0.026
10-20%	2.393	0.155
20-40%	2.024	0.288
>40%	0.362	0.075
Cut Slope to POC (sub-areas 2, 8, 9, 9a)	N/A	0.642
Fill Slope to POC (sub-areas 3, 3b, 4, 5a, 5b, 5c, 6)	N/A	1.002
Total[(1)]	**5.126**	**2.188**

(1): Offsite area not included (entrance) as it is not a PCCSYA in Pre-Dev. conditions

E_P Calculation

To calculate E_P, the author of this report proposed an equation approved in Appendix H to estimate the dimensionless Wt work for both pre-development and post-development conditions (equation H.8.1):

$$W_t = \sum_{j=1}^{n} \Delta t_j \left[Q^{1.5m} - \left(0.1 \cdot Q_2\right)^{1.5m} \right]^{1.5} Q^m \qquad \text{(equation H.8.1).}$$

However, to increase accuracy, the previous equation will be applied to *ALL* peak flows larger than the pre-development $0.1 \cdot Q_2$ flow in both pre-development and post-development conditions so that an arbitrary flow bin length does not need to be chosen, and Δt becomes irrelevant, not only because it is

constant and equal to 1 hour, but because it will not change between pre and post-development conditions (all peaks analyzed will have 1 hour duration).

Therefore, the equations used here are:

$$W_{t,pre} = \sum_{j=1}^{N} \left[Q_{pre,j}^{1.5m} - \left(0.1 \cdot Q_{2,pre}\right)^{1.5m} \right]^{1.5} Q_{pre,j}^{m} \qquad (1.a)$$

$$W_{t,post} = \sum_{j=1}^{M} \left[Q_{post,j}^{1.5m} - \left(0.1 \cdot Q_{2,pre}\right)^{1.5m} \right]^{1.5} Q_{post,j}^{m} \qquad (1.b)$$

The following is the explanation of the variables:

$W_{t,pre}$, $W_{t,post}$: Pre and post-development total work associated with all flows that exceed the minimum threshold (10% of pre-development 2 year peak flow = $0.1 \cdot Q_{2,pre}$)

N, M: Number of pre-development and post-development flows, respectively, exceeding 10% of $Q_{2,pre}$ (N = 669 and M = 690).

$Q_{pre,j}$, $Q_{post,j}$: Pre and post-development peak flows, sorted from high to low (j=1 is the largest, and j=250 is the 250th largest hourly peak flow value, for example).

m : Exponent associated with the geometry of the receiving channel. Intermediate conditions were assumed here; therefore m =4/13 (per Appendix H).

The overall Erosion Potential index E_P is defined as $E_P = W_{t,post}/W_{t,pre}$.

E_P calculations are displayed in Appendix 4. Peak flows are imported from the SWMM Model results of the REC's Technical Memorandum "Hydromodification Compliance of ResQue Ranch". Overall results are shown in Table 2.

S_P Calculation

For the determination of S_P, the sediment yield in pre and post-development conditions is needed. The following procedure was followed (please see S_P detailed calculations in Appendix 5):

- In both pre and post-development conditions, the areas at each slope range (determined with the slope analysis) was obtained. This area was multiplied by the sediment yield depending on the slope, according to the information provided by the County included in Appendix 3 (Table A.4.2 from the Regional WMAA Analysis)
- Only sediment yield from critical areas was considered (those areas with a slope larger than 20% for the geology and land use assigned in this project). The sediment yield for natural areas is 26.34 ton/yr in pre-development and 4.06 ton/yr in post-development (significantly smaller as the preserved critical area reduced from 2.386 acres to only 0.363 ares).
- In post-development conditions, additional coarse sediment producing areas was considered from the slopes of the development. Sediment yield factors were corrected from Table A.4.2 to account for slight changes in K, LS and P factors (P is a support practice factor, assumed 0.5 for fill slopes and 0.25 for cut slopes, per Appendix H; it can also be seen as a safety factor)

- The sediment yield of the post-development slopes is 11.73 ton/yr; therefore, the total post-development sediment yield based on RUSLE is 15.80 ton/yr. As a consequence, SY_{RUSLE} can be determined as SY_{RUSLE} = 15.80/26.34 = 0.600.
- Sediment yield should include channel analysis. As there are no NHDplus channels in the property, Appendix H allows the simplification $S_P = S_{YRUSLE}$. Therefore, the overall S_P is 0.600 (See Appendix 5).

E_P/S_P

The overall E_P/S_P factor is the value: 0.586/0.600 = 0.98 $\leq$ 1.1. Therefore, no net impact is reached and no further analysis is required.

TABLE 2 – SUMMARY OF RESULTS

E_P/S_P = 1.09 ≤ 1.1	
$W_{t,pre}$ = 213.78	SY_{RUSLE} : 0.600
$W_{t,post}$ = 125.26	$SY_{CHANNEL}$: N/A
E_P = 0.586	S_P = 0.600

Slope to Guarantee v = 3 ft/s for Type B Brow Ditch (2 ft Diameter)

The brow ditch to be used in this project is Type B (circular half pipe), 2 ft in diameter. There are no tables in Appendix H to determine the minimum slope required for areas draining to a brow-ditch of those dimensions. Therefore, Manning's equation has been applied to determine the minimum slope needed as a function of the 2 year peak flow. Also, as (a) the C coefficient is about C = 0.30 (average C coefficient from 75% C, 13% soil D and 12% soil B) and (b) the 6 hr, 2 year intensity is 1.20 inches (which generates a 5 min intensity of 3.16 in/hr) then the contributing area A is also included in relation with the slope. As long as the brow-ditch slope is equal or larger than those shown in Table 3, as a function of Q (cfs) or contributing area A (sq-ft) there will be enough velocity in all brow ditches to transport the coarse sediment. This table is identical but more detailed than that shown in section H.3.1 of the BMP Manual.

TABLE 3. Slope s needed for a velocity of 3 ft/s as a function of Q (cfs) or Area (sq-ft)

α (rad)	A_{flow} (ft^2)	P (ft)	R_H (ft)	h (ft)	s	Q (cfs)	v (ft/s)	A (sq-ft)
0.92	0.062	0.92	0.068	0.104	***0.025***	***0.187***	3.00	***8600***
1.004	0.080	1.004	0.080	0.123	***0.02***	***0.240***	3.00	***11000***
1.126	0.112	1.126	0.099	0.154	***0.015***	***0.335***	3.00	***15400***
1.327	0.178	1.327	0.134	0.212	***0.01***	***0.535***	3.00	***24600***
1.497	0.250	1.497	0.167	0.267	***0.0075***	***0.750***	3.00	***34400***
1.786	0.405	1.786	0.227	0.373	***0.005***	***1.215***	3.00	***55800***

CONCLUSION

This study has demonstrated that the proposed HMP BMPs provided for the ResQue Ranch site in addition to the protection of the remaining natural area, and the diversion of the runoff from the slope areas indicated in Table 1 is sufficient to meet the No Net Impact Criteria defined as $E_P/S_P \leq 1.1$.

APPENDICES

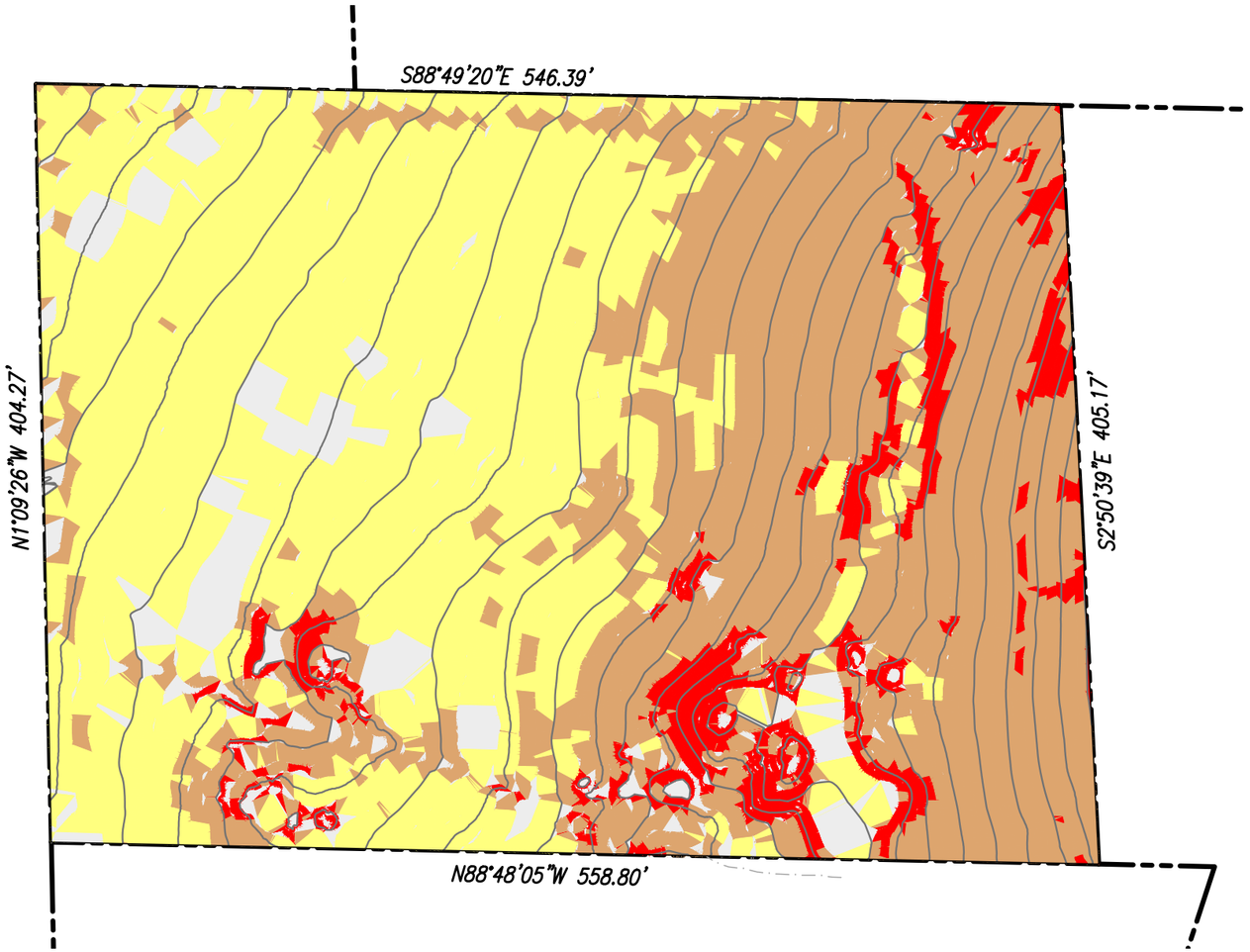
1. - GIS Information
   - Geology Map
   - Tables H.6.2-1 and H.6.2-2 from Appendix H of the BMP Manual
2. - Slope Analysis Map = Pre-Development Map
   - Post-Development Map
3. Table A.4.2 from Regional WMAA Attachment (Per County of San Diego provided information)
4. E_P Calculations (Including all Peaks Larger than 10% of Q_2)
5. S_P Calculations (Including Overall E_P/S_P value)
6. Response to Comments

REFERENCES

[1] – *County of San Diego BMP Design Manual – Appendix H*

APPENDIX 1

- Slope Analysis Map = Pre-Development Map
- Post-Development Map :
    - Slope Analysis
    - Areas for Hydromodification Model
    - Identification of CCSYAs in Post-Dev: Preserved Natural, Slopes (Cut and Fill) and Brow Ditches to convey Flows and Sediments.



Slope Analysis Table				
Number	Minimum Slope	Maximum Slope	Color	Square footage
1	0.00%	10.00%		15115
2	10.00%	20.00%		104254
3	20.00%	40.00%		88180
4	40.00%	100.00%		15759

PREPARED UNDER THE SUPERVISION OF:

RAMON J. SPEAR L.S. 6404 DATE

LICENSED LAND SURVEYOR
RAMON J. SPEAR
NO. 6404
STATE OF CALIFORNIA

"PRE"

RPO STEEP SLOPE LANDS MAP FOR:
RESQUE RANCH
LOCATION:
HIGHLAND VALLEY ROAD, ESCONDIDO CA

SPEAR & ASSOCIATES, INC
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866

N

SCALE: 1" = 80 '

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O CHARLES "PHIL" PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

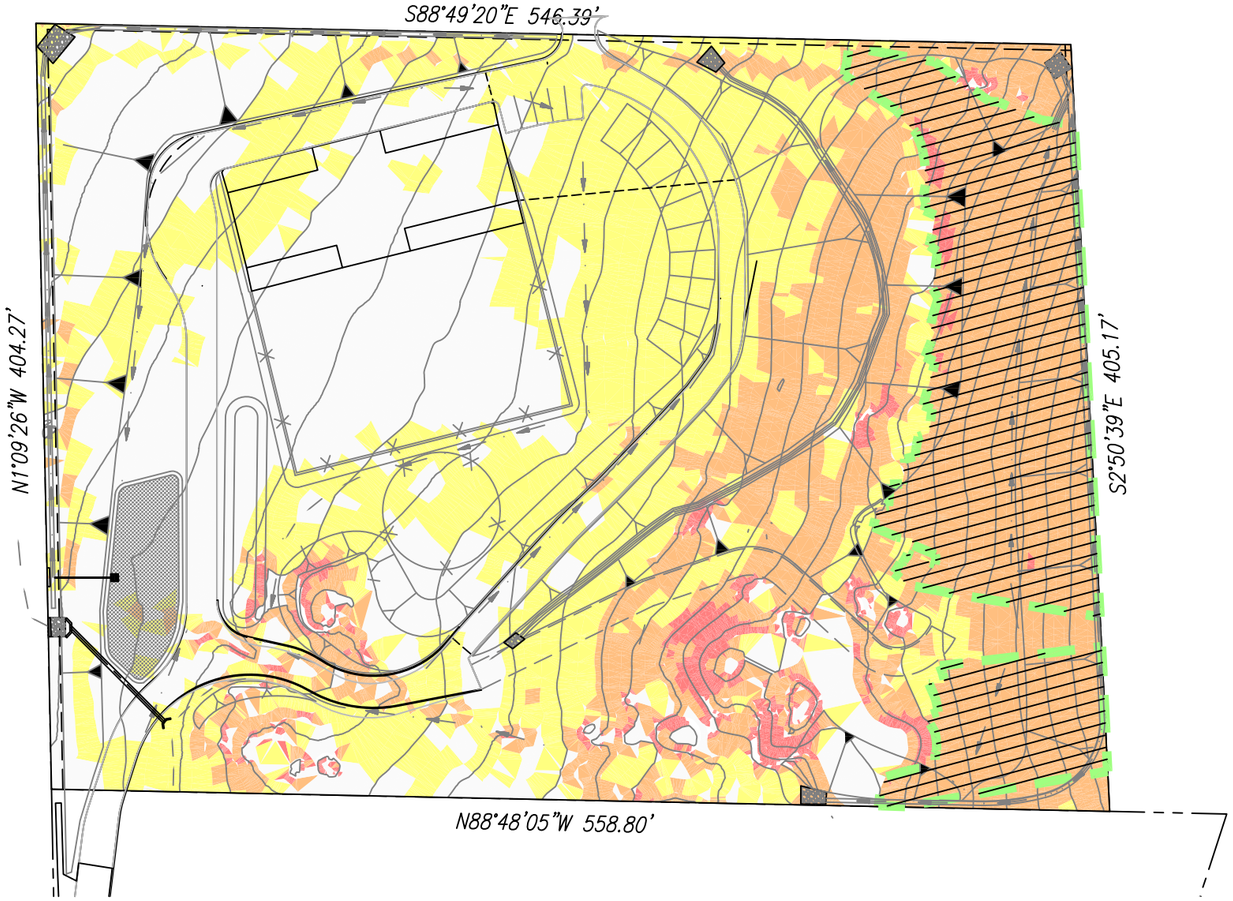
APN:

276-030-48 & 49

TOPOGRAPHY SOURCE

SPEAR & ASSOCIATES, INC.
475 PRODUCTION STREET, SAN MARCOS, CA 92078
TOPO SOURCE METHOD : AERIAL TOPOGRAPHY
TOPO SOURCE DATE: 04-20-2015

PLOT DATE: //20/2016 2:16 PM S:\Spear Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD\ESCONDIDO\ADD14-160EA-SA.dwg



Slope Analysis Table				
Number	Minimum Slope	Maximum Slope	Color	Square footage
1	0.00%	15.00%		70441
2	15.00%	25.00%		78715
3	25.00%	50.00%		67749
4	50.00%	100.00%		6359

EXISTING RPO STEEP SLOPE AREA = 31,950 SQ. FT.
PERCENTAGE OF DISTURBED EXISTING STEEP SLOPE AREA = 100%

PREPARED UNDER THE SUPERVISION OF:

RAMON J. SPEAR L.S. 6404 DATE

LICENSED LAND SURVEYOR
RAMON J. SPEAR
NO. 6404
STATE OF CALIFORNIA

N

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(619) 814-0050

APN:

276-030-48 & 49

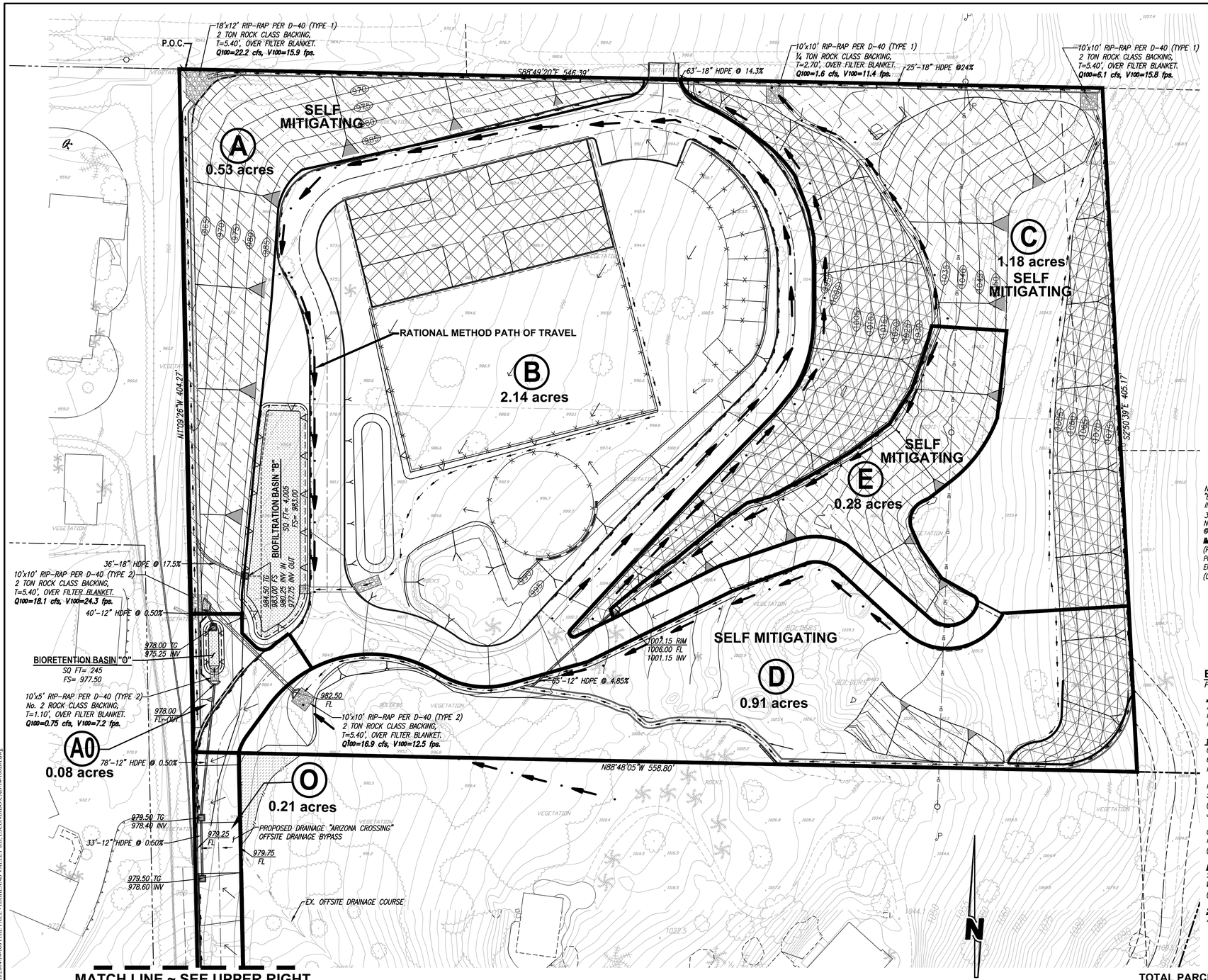
TOPOGRAPHY SOURCE

SPEAR & ASSOCIATES, INC.
475 PRODUCTION STREET, SAN MARCOS, CA 92078
TOPO SOURCE METHOD : AERIAL TOPOGRAPHY
TOPO SOURCE DATE: 04-20-2015

"POST"

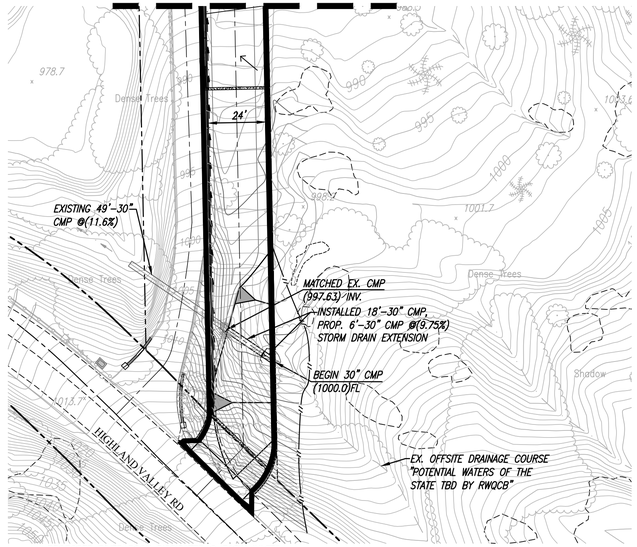
RPO STEEP SLOPE LANDS MAP FOR:
RESQUE RANCH
LOCATION:
HIGHLAND VALLEY ROAD, ESCONDIDO CA

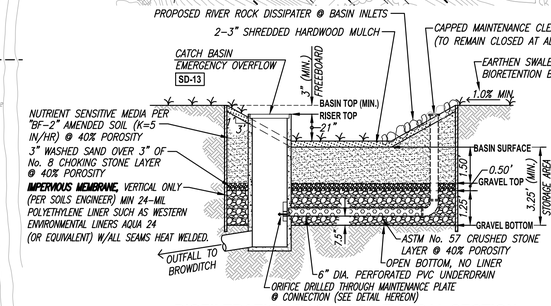
SPEAR & ASSOCIATES, INC
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866



MATCH LINE ~ SEE UPPER RIGHT

MATCH LINE ~ SEE LOWER LEFT





BIOFILTRATION BASIN "B" TYPICAL SECTION

TYPICAL DETAIL & OUTLET CONNECTION

BIOFILTRATION BASIN BF-1 & BF-2 W/NUTRIENT SENSITIVE MEDIA DESIGN

NOT-TO-SCALE

BIOFILTRATION BASIN MEDIA

PER COUNTY OF SAN DIEGO 2014 LID HANDBOOK, APPENDIX C – FACT SHEETS.

3" MULCH LAYER (MANDATORY)

A MINIMUM OF 3 INCHES OF WELL-AGED, SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS IS PROVIDED. MULCH MUST BE NON-FLOATING TO AVOID CLOGGING OF OVERFLOW STRUCTURE.

18" AMENDED SOIL LAYER

COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD (1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

DRAINAGE LAYER

SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 3 INCHES OF WASHED SAND (ASTM NO. 33), FOLLOWED BY 3 INCHES OF CHOKING STONE (ASTM NO. 8), OVER A 1.25-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION

AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.

SELF-MITIGATING DMAS

SELF-MITIGATING DMAS CONSIST OF NATURAL OR LANDSCAPED AREAS THAT DRAIN DIRECTLY OFFSITE OR TO THE PUBLIC STORM DRAIN SYSTEM. SELF-MITIGATING DMAS MUST MEET ALL OF THE FOLLOWING TO BE ELIGIBLE FOR EXCLUSION:

- *VEGETATION IN THE NATURAL OR LANDSCAPED AREA IS NATIVE AND/OR NON-NATIVE/NON-INVASIVE DROUGHT TOLERANT SPECIES THAT DO NOT REQUIRE REGULAR APPLICATION OF FERTILIZERS AND PESTICIDES.*
- *SOILS ARE UNDISTURBED NATIVE TOPSOIL, OR DISTURBED SOILS THAT HAVE BEEN AMENDED AND AERATED TO PROMOTE WATER RETENTION CHARACTERISTICS EQUIVALENT TO UNDISTURBED NATIVE TOPSOIL.*
- *THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.*
- *IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NOT BE HYDRAULICALLY CONNECTED TO OTHER IMPERVIOUS AREAS UNLESS IT IS A STORM WATER CONVEYANCE SYSTEM (SUCH AS A BROW DITCH).*
- *THE SELF-MITIGATING AREA IS HYDRAULICALLY SEPARATE FROM DMAS THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMPS.*

DRAINAGE AREA TABLE								OFFSITE
SYMBOL	PROPOSED SURFACE	AREA A	AREA B	AREA C	AREA D	AREA E	AREA AO	AREA O
SOIL TYPE		TYPE "C"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "B,C&D"	TYPE "C"	TYPE "C"
	ROOFTOPS	0 SF	9,753 SF	0 SF	0 SF	0 SF	0 SF	0 SF
	AC PAVING, WALKWAYS, HARDSCAPE, ETC.	0 SF	18,907 SF	0 SF	0 SF	0 SF	1,843 SF	5,345 SF
	STABILIZED PERVIOUS AREA	23,097 SF	64,491 SF	51,512 SF	39,562 SF	12,253 SF	1,846 SF	0 SF

30 15 0 30 60 90

SCALE: 1" = 30'

SEDIMENT PRODUCING CUT SLOPE

SEDIMENT PRODUCING FILL SLOPE

LEGEND

PROJECT BOUNDARY

PROP. CONCENTRATED FLOW

PROP. SHEET FLOW

DRAINAGE AREA BOUNDARY

DRAINAGE AREA DESIGNATION (E)

TOTAL PARCEL AREA

223,264 SQUARE FEET

SITE ADDRESS:

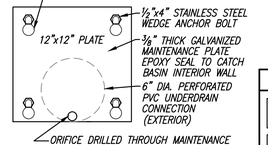
HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814-0050

APN:

276-030-48 & 49



MAINTENANCE PLATE DETAIL

ATTACH TO INTERIOR INLET WALL OF CATCH BASIN

PRIVATE CONTRACT

SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

BMP PLAN FOR:

RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER — JOSHUA R. ZEIGLER — No. 85413 — CIVIL — STATE OF CALIFORNIA

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

PLOT DATE: 11/27/2018 6:55 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160DA.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 ARN

POC

S88°49'20"E 546.39'

SELF MITIGATING

A
0.53 acres

SOIL TYPE C

C-LID 1

B
2.14 acres

C
1.18 acres
SELF MITIGATING

SELF MITIGATING

E
0.28 acres

SOIL TYPE B

SELF MITIGATING

SOIL TYPE D

D
0.91 acres

LID 1

LID 2

A0
0.08 acres

O
0.21 acres

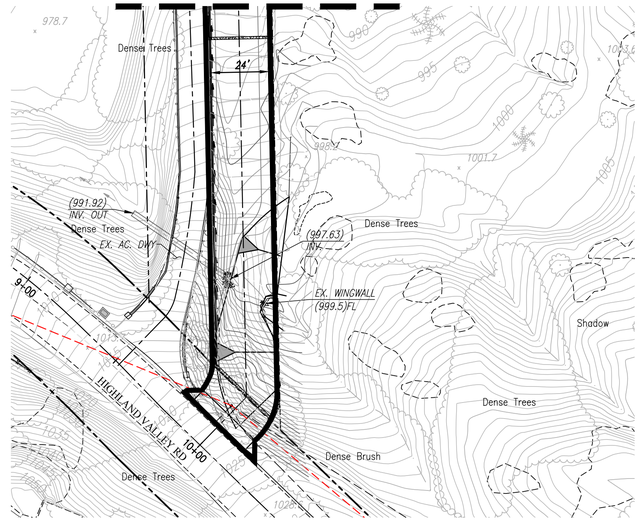
N88°48'05"W 558.80'

N 32°50'53"W 404.27'

S 32°50'53"E 405.17'

MATCH LINE ~ SEE UPPER RIGHT

MATCH LINE ~ SEE LOWER LEFT



LEGEND

- PROJECT BOUNDARY
- PROP. CONCENTRATED FLOW
- PROP. SHEET FLOW
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA DESIGNATION (E)
- SOIL TYPE DELINEATION
- CCSY AREA
- BROWDITCHES (TYPE B)
- FILL SLOPE (CONTRIBUTES CRITICAL COURSE SEDIMENT)
- CUT SLOPE (CONTRIBUTES CRITICAL COURSE SEDIMENT)
- NATURAL 20%–40% (CRITICAL)
- NATURAL GREAT THAN 40% (CRITICAL)

TOTAL PARCEL AREA

223,264 SQUARE FEET

SITE ADDRESS:

HIGHLAND VALLEY ROAD
ESCONDIDO, CA 92025

OWNER/APPLICANT:

4030 GOLDFINCH INVESTMENT, LLC
C/O PHILS PACE
15635 PASEO PENASCO
ESCONDIDO CA 92025
(619) 814–0050

APN:

276–030–48 & 49

PRIVATE CONTRACT

SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

POST DEVELOPMENT CCSY AREA PLAN FOR:

RESQUE RANCH

HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX .

APPROVED FOR:
SIROUS DEYLAMIAN
COUNTY ENGINEER

BY: _____ DATE

ENGINEER OF WORK:
DANNY ABADA R.C.E. NO. 45381 EXP. 9–30–16

GRADING PERMIT NO. PDS2016–

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736–2040 FAX (760) 736–4866
WWW.SPEARINC.NET

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1–760–736–2040

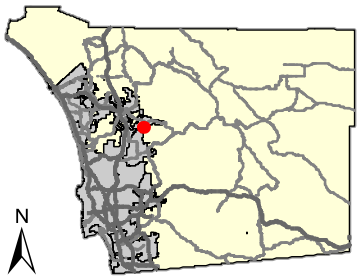
PLOT DATE: 4/25/2017 10:56 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160CCSY Exhibit.dwg

SPEAR & ASSOCIATES PROJECT NO. 14–160 ARN

APPENDIX 2

- GIS Information
- Geology Map
- Tables H.6.2-1 and H.6.2-2 from Appendix H of the BMP Manual

LUIS 01 2014 ORTHOPHOTO



Legend:

PROJECT AREA

Notes:

0 0.02 0.04 0.06 0.08 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

Planning and Development Services

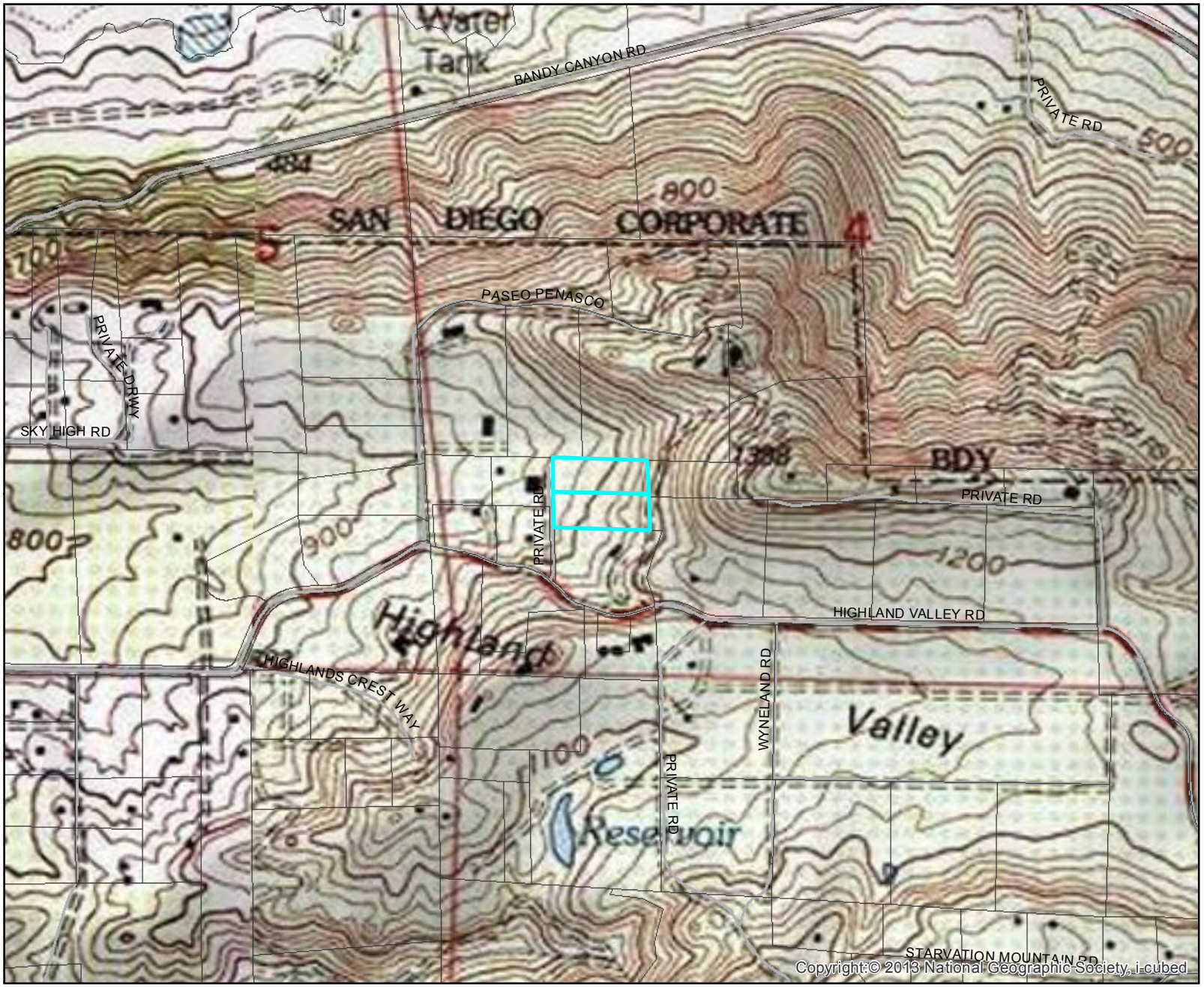
N

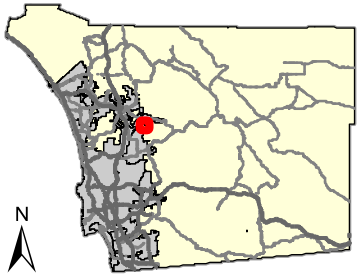
This map is generated automatically from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

LUEG GIS

Land Use & Environment Group
Geographic Information Services

LUIS 01 TOPO MAP





Legend:

PROJECT AREA

Notes:

0 0.1 0.2 0.3 0.4 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

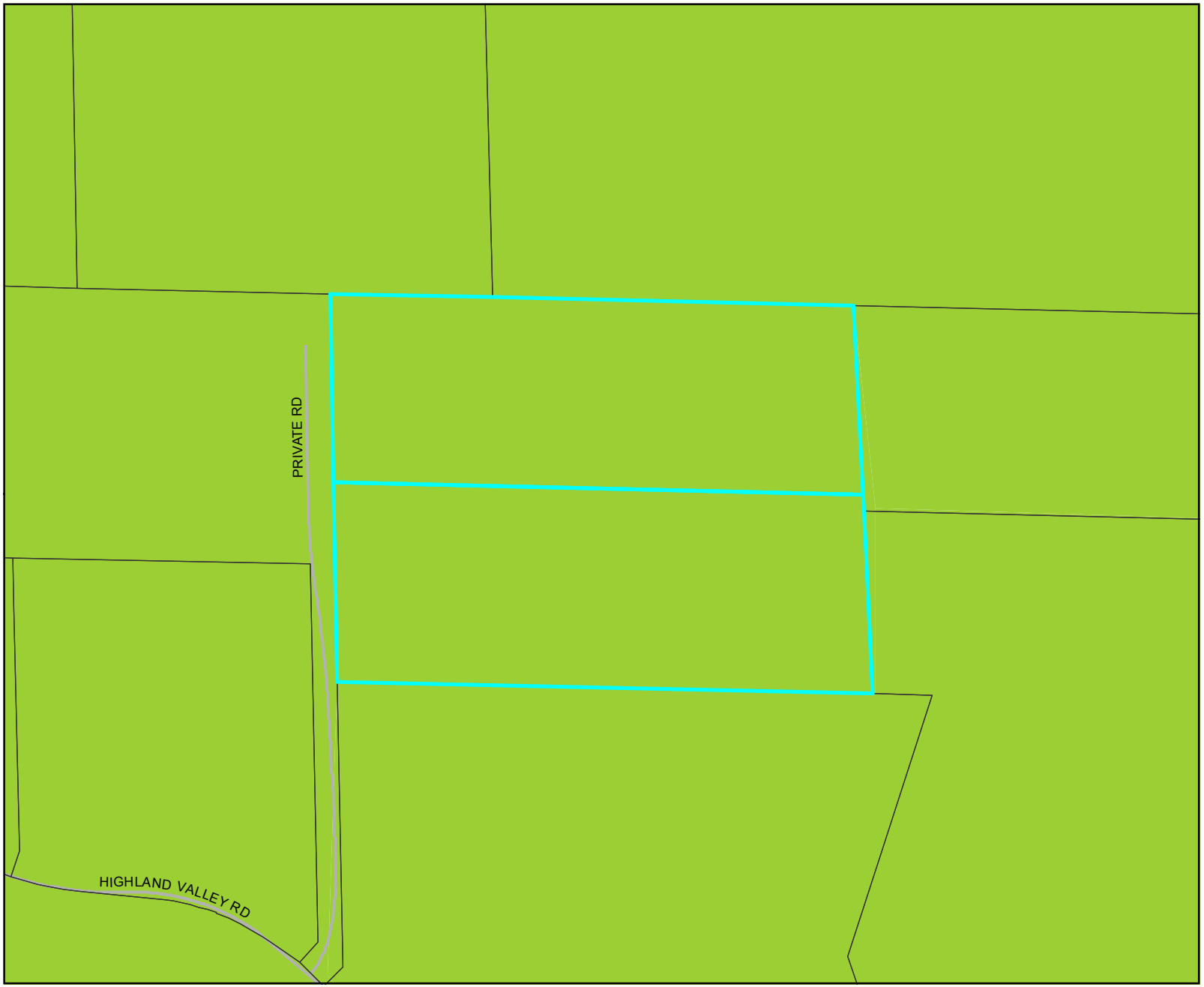
Planning and Development Services

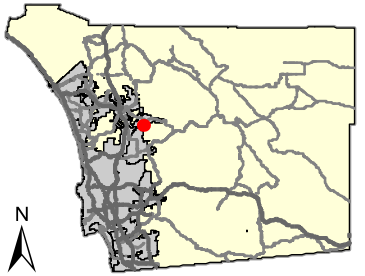
N

This map is generated automatically from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

LUEG GIS
Land Use & Environment Group
Geographic Information Services

LUIS 01 ZONING - USE





Legend:

- PROJECT AREA

USE REGULATION

- Agriculture
- Commerical and Office
- Industrial
- Multi-Family Residential
- Residential Mobile Home
- Rural Residential
- Residential - Single
- Residential - Urban
- Residential - Variable
- Fallbrook Revitalization Area
- Open Space
- Extractive Use
- Transportation and Utility
- Limited Control
- Specific Plan
- Holding Area
- General Rural
- City of San Diego/No Zone
- Indian Reservation

Notes:

0 0.02 0.04 0.06 0.08 Miles

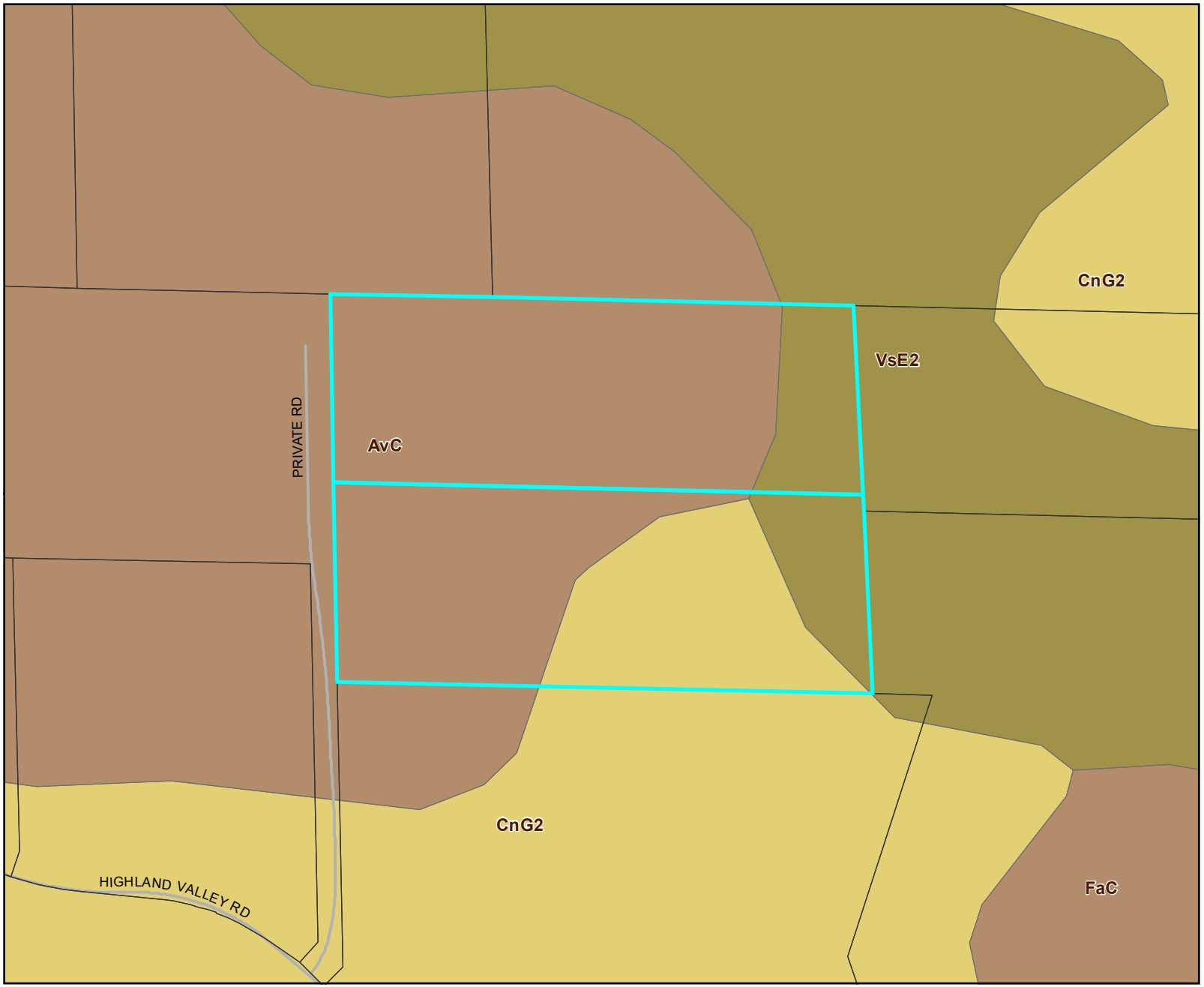
NAD 1983 StatePlane California VI FIPS 0406 Feet

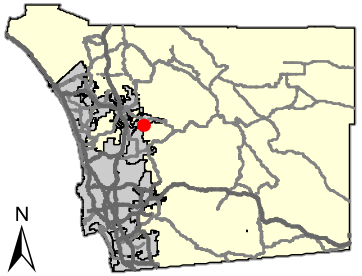
Planning and Development Services

N

This map is generated automatically from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

LUIS 01 SOIL





Legend:

- PROJECT AREA

SOILS

- ALFISOLS
- ENTISOLS
- INCEPTISOLS
- MOLLISOLS
- VERTISOLS
- OTHER
- URBAN
- WATER
- UNKNOWN

Notes:

0 0.02 0.04 0.06 0.08 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

Planning and Development Services

N

This map is generated automatically from an internet mapping site and is for reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
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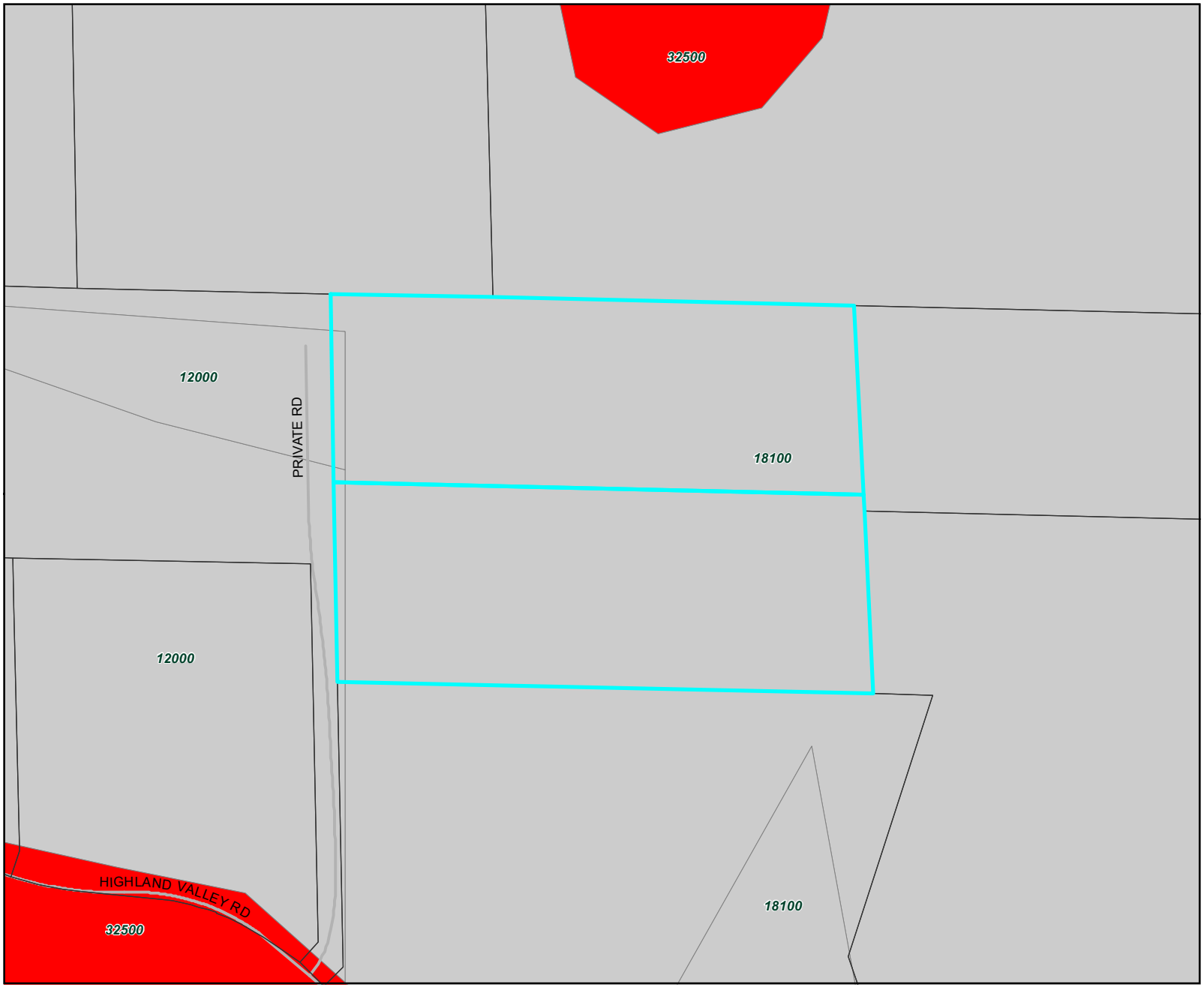
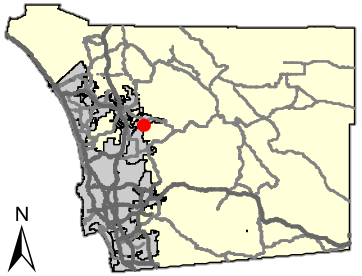
SOIL	DESCRIPTION	CAP CLASS	STORIE INDEX	SHRINK/SWELL	EROSION INDEX
AvC	Arlington coarse sandy loam, 2 to 9 percent slopes	3e-8(19)	47	Low	Severe 16
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded	6e-1(19)	33	Low	Moderate 2
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded	7e-7(19), 8s-1(19)	7, X	Low	Severe 1

LUIS 01 VEGETATION





Legend:

- PROJECT AREA

VEGETATION CATEGORY

- Southern Foredunes, Beach, Saltpan Mudflats
- Coastal Sage Scrub
- Chaparral
- Grassland
- Riparian Scrub
- Riparian Woodland
- Riparian Forest
- Pinyon Juniper Woodlands
- Other Woodlands
- Oak Forest
- Vernal Pool, Meadow and Seep
- Marsh
- Coniferous Forest
- Desert Dunes (22100, 22300, 24000)
- Playas/Badlands/Mudhill Forbs
- Desert Scrub
- Desert Chaparral
- Dry Wash Woodland
- Water (including 11200, 13200)
- Urban, Disturbed Habitat, Agriculture. Eucalyptus Woodland

Notes:

0 0.02 0.04 0.06 0.08 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

Planning and Development Services

N

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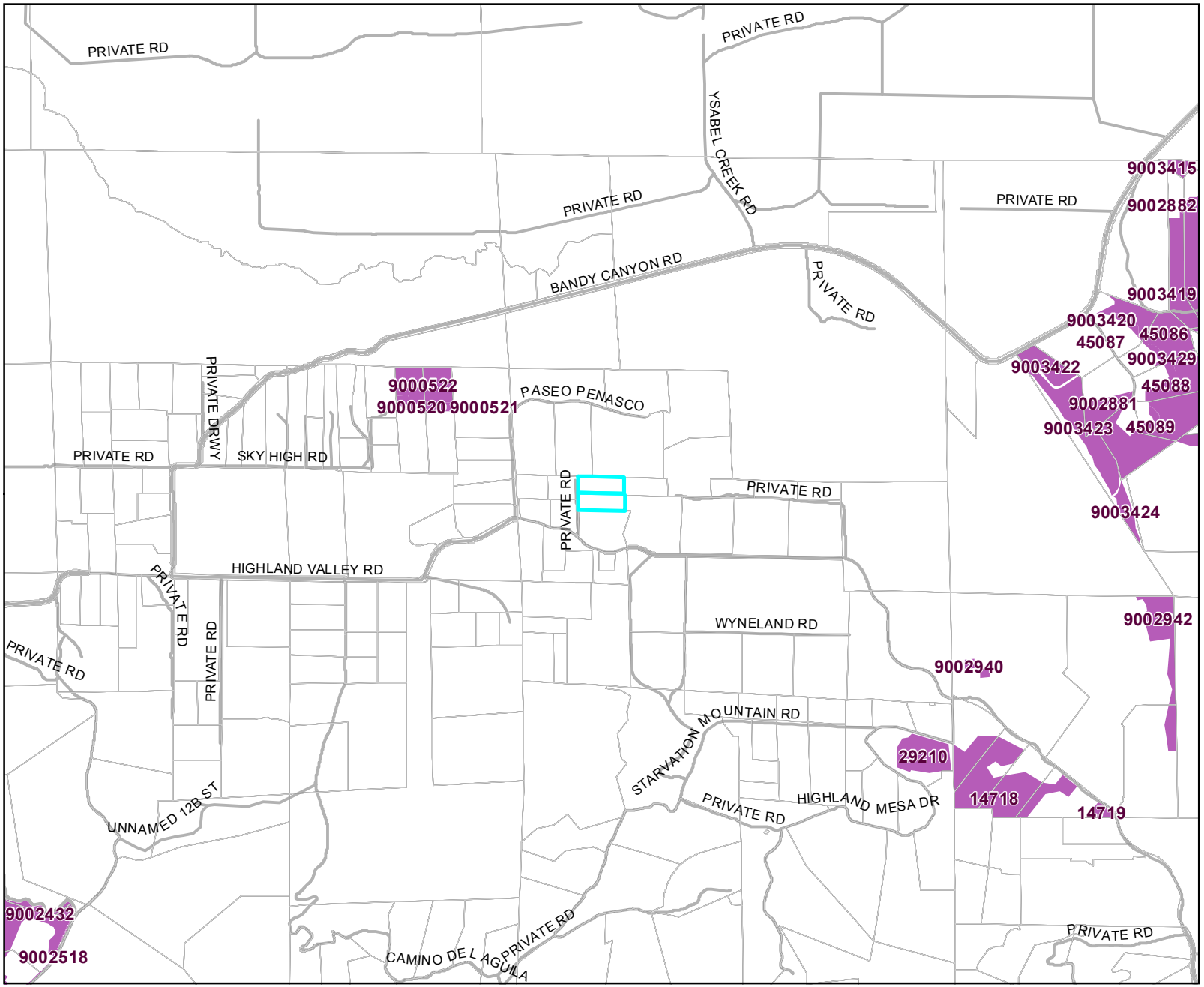
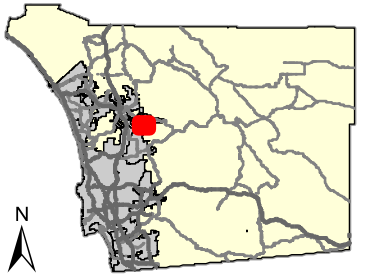
LUIS 01 OPEN SPACE EASEMENTS





Legend:

- PROJECT AREA

OPEN SPACE EASEMENT

- Biological
- Conservation
- Open Space
- Private Open Space
- Recreational

Notes:

0 0.2 0.4 0.6 0.8 Miles

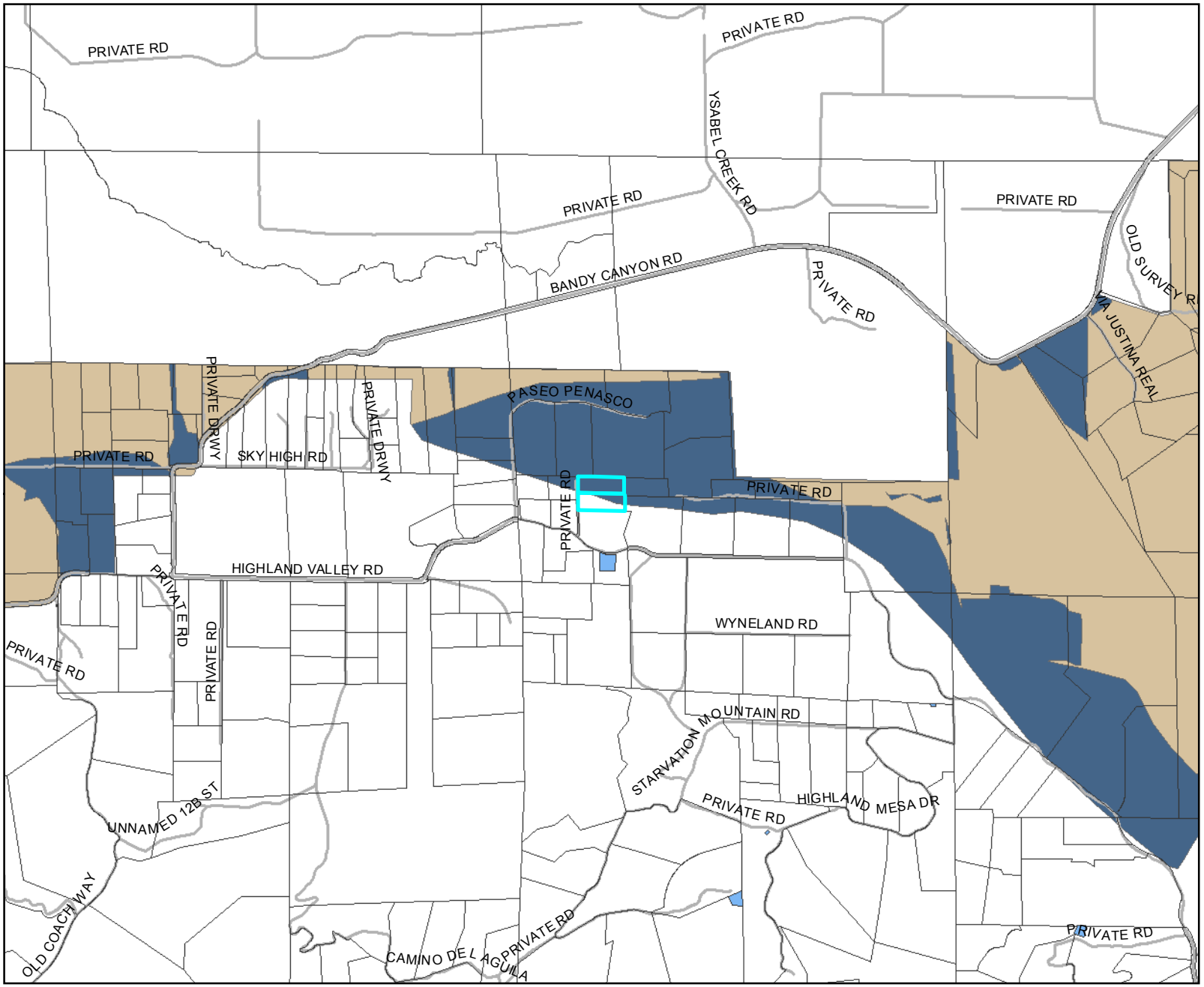
NAD 1983 StatePlane California VI FIPS 0406 Feet

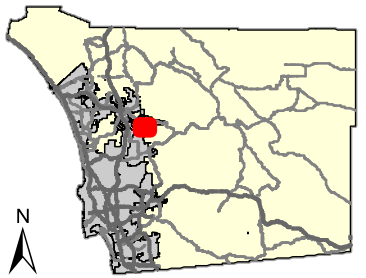
Planning and Development Services

N

This map is generated automatically from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

LUIS 01 MSCP





Legend:

- PROJECT AREA

MSCP DESCRIPTION

- State and Federal Pre-Approved Mitigation Area (PAMA)
- Hardline Preserve
- Take Authorized Area
- Conserved Subject to Agreement with Wildlife Agencies
- Otay Ranch Areas Where no Take Permits will be Issued
- Major Amendment Area
- Minor Amendment Area
- Minor Amendment Area Subject to Special Considerations
- Santa Fe Valley Sensitive Biological Habitat 'D' Designator Areas
- Golf Course Related Development Allowed in Santa Fe Valley Open Space II Areas
- Unincorporated Land in Metro-Lakeside-Jamul Segment

NMSCP (DRAFT) DESCRIPTION

- Preserve Areas
- Pre-Approved Mitigation Area (PAMA)
- Outside PAMA
- Pre-negotiated (Hardlined) Take Authorized Areas
- Special Districts
- Tribal Lands/Out of Plan
- US Forest Service

0 0.2 0.4 0.6 0.8 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

Planning and Development Services

N

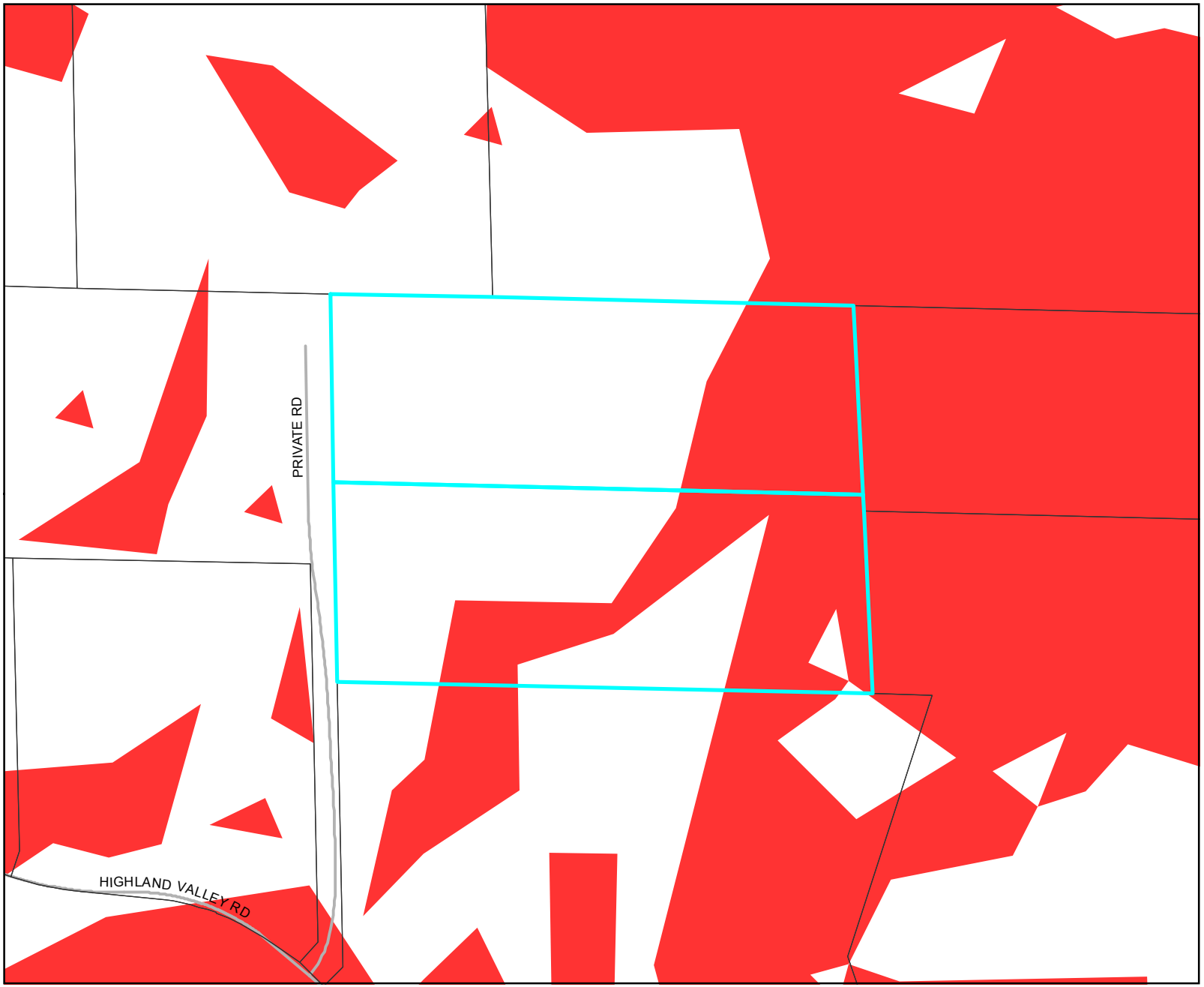
This map is generated automatically from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

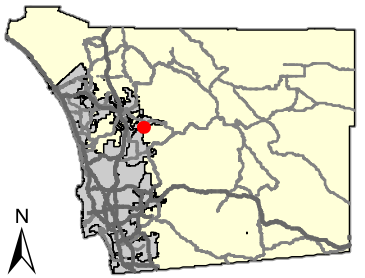
Notes:

MSCP = Multiple Species Conservation Program

LUEG GIS
Land Use & Environment Group
Geographic Information Services

LUIS 01 STEEP SLOPES





Legend:

- PROJECT AREA
- STEEP SLOPE (> 25%)

Notes:

0 0.02 0.04 0.06 0.08 Miles

NAD 1983 StatePlane California VI FIPS 0406 Feet

Planning and Development Services

N

This map is generated automatically from an internet mapping site and is for reference only.
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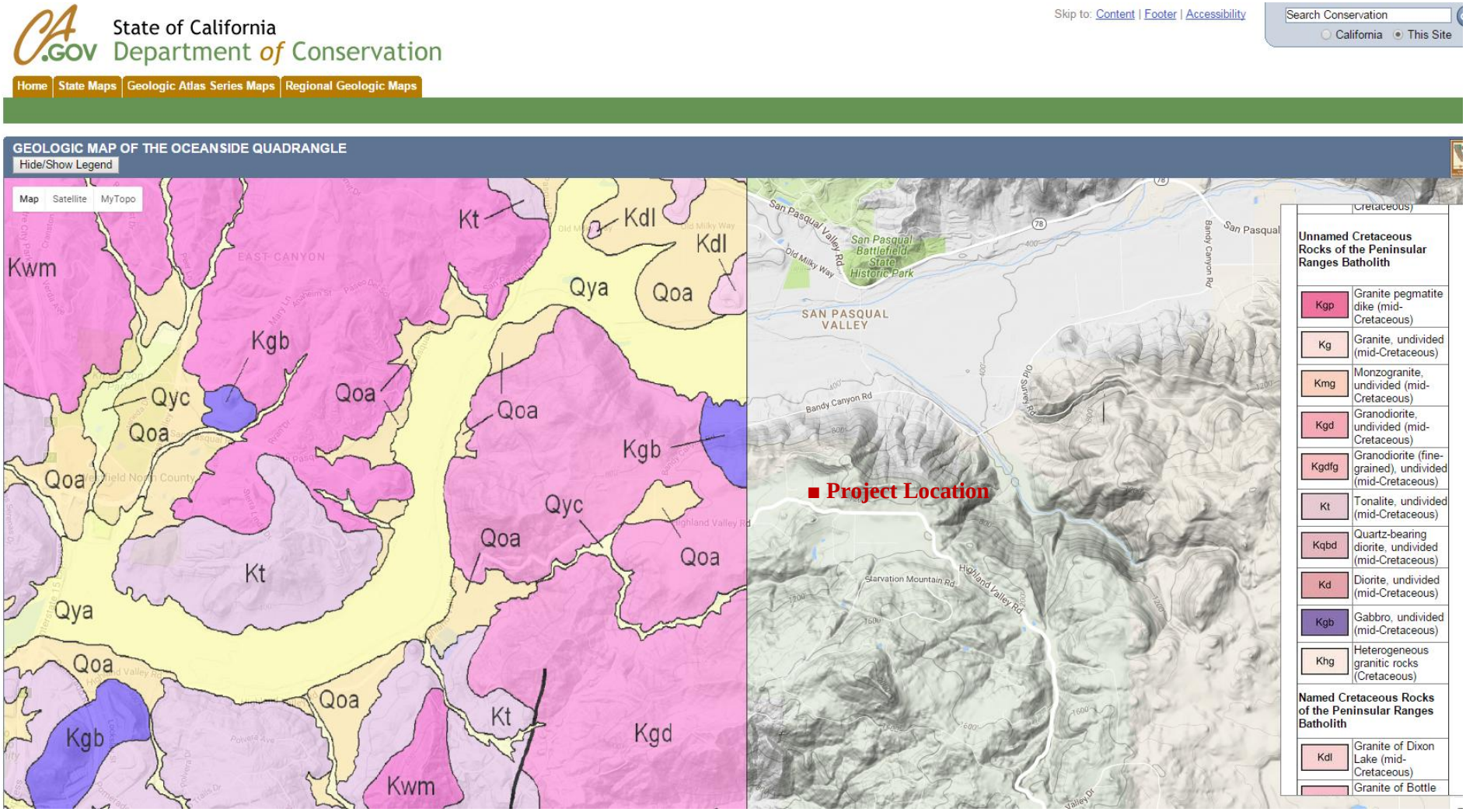

Geology Map. Notice that project is just outside Map boundaries but Kgd and Kgb are the geologic types adjacent to the project area. Both qualify as CB.

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable / Permeable	Geology Grouping
Tmo	Oceanside 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
Qmo	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
QTso	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
af	San Diego & Oceanside 30' x 60'	Variable, dependent on source material	Sedimentary		Other

Table H.6.2-2: Land Cover Grouping for SanGIS Ecology-Vegetation Data Set

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
1	42000 Valley and Foothill Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass
2	42100 Native Grassland		Agricultural/Grass
3	42110 Valley Needlegrass Grassland		Agricultural/Grass
4	42120 Valley Sacaton Grassland		Agricultural/Grass
5	42200 Non-Native Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass
6	42300 Wildflower Field		Agriculture/Grass
7	42400 Foothill/Mountain Perennial Grassland		Agriculture/Grass
8	42470 Transmontane Dropseed Grassland		Agriculture/Grass
9	45000 Meadow and Seep		Agriculture/Grass
10	45100 Montane Meadow		Agriculture/Grass
11	45110 Wet Montane Meadow		Agriculture/Grass
12	45120 Dry Montane Meadows		Agriculture/Grass
13	45300 Alkali Meadows and Seeps		Agriculture/Grass
14	45320 Alkali Seep		Agriculture/Grass
15	45400 Freshwater Seep		Agriculture/Grass
16	46000 Alkali Playa Community		Agriculture/Grass
17	46100 Badlands/Mudhill Forbs		Agriculture/Grass
18	Non-Native Grassland		Agriculture/Grass
19	18000 General Agriculture	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Agriculture/Grass
20	18100 Orchards and Vineyards		Agriculture/Grass
21	18200 Intensive Agriculture		Agriculture/Grass
22	18200 Intensive Agriculture - Dairies, Nurseries, Chicken Ranches		Agriculture/Grass
23	18300 Extensive Agriculture - Field/Pasture, Row Crops		Agriculture/Grass
24	18310 Field/Pasture		Agriculture/Grass
25	18310 Pasture		Agriculture/Grass
26	18320 Row Crops		Agriculture/Grass
27	12000 Urban/Developed		Developed
28	12000 Urban/Develpoed		Developed
29	81100 Mixed Evergreen Forest	Forest	Forest
30	81300 Oak Forest		Forest
31	81310 Coast Live Oak Forest		Forest
32	81320 Canyon Live Oak Forest		Forest
33	81340 Black Oak Forest		Forest
34	83140 Torrey Pine Forest		Forest

Note the GLU nomenclature is presented in the following format: Geology – Land Cover – Slope Category (e.g., "CB-Agricultural/Grass-3" for a GLU consisting of coarse bedrock geology, agricultural/grass land cover, and 20% to 40% slope).

GLUs are created by intersecting the geologic categories, land cover categories, and slope categories. This is a similar procedure to intersecting land uses with soil types to determine runoff coefficients or runoff curve numbers for hydrologic studies, but there are three categories to consider for the GLU analysis (slope, geology, and land cover), and the GLUs are not to be composited into a single GLU. When GLUs have been created, determine whether any of the GLUs listed in Table H.6-3 are found within the project boundary. The GLUs listed in Table H.6-3 are considered to be PCCSYAs.

If none of the GLUs listed in Table H.6-3 are present within the project boundary and area draining through the project boundary, no measures for protection of critical coarse sediment yield areas are necessary. If one or more GLUs listed in Table H.6-3 are present within the project boundary, they shall be considered critical coarse sediment yield areas. Complete Worksheet H.6-1 to document verification of GLUs.

Table H.6.2-1: Geologic Grouping for Different Map Units

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable / Permeable	Geology Grouping
gr-m	Jennings; CA	Coarse	Bedrock	Impermeable	CB
grMz	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Jcr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jhc	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jsp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ka	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcc	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kdl	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgbf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgdf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgh	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm1	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm2	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm3	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm4	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgu	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB

APPENDIX 3

Table A.4.2 from Regional WMAA Attachment

Table A.4.2 Relative Sediment Production for different Geomorphic Landscape Units

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
CB-Agricultural/Grass-1	52883	0.20	4.67	0.14	50	6.5	Medium	No
CB-Agricultural/Grass-2	40633	0.21	5.19	0.14	56	8.3	Medium	No
CB-Agricultural/Grass-3	32617	0.22	6.04	0.14	57	10.6	High	Yes
CB-Agricultural/Grass-4	11066	0.23	7.38	0.14	57	13.5	High	Yes
CB-Developed-1	39746	0.22	3.77	0	49	0	Low	No
CB-Developed-2	32614	0.22	4.28	0	50	0	Low	No
CB-Developed-3	15841	0.22	4.86	0	49	0	Low	No
CB-Developed-4	1805	0.22	5.63	0	48	0	Low	No
CB-Forest-1	32231	0.20	6.38	0.14	39	6.8	Medium	No
CB-Forest-2	38507	0.20	7.20	0.13	45	8.8	High	Yes
CB-Forest-3	55303	0.20	8.14	0.13	48	10.6	High	Yes
CB-Forest-4	38217	0.20	9.95	0.14	50	13.6	High	Yes
CB-Other-1	1036	0.20	5.52	0.13	45	6.5	Medium	No
CB-Other-2	317	0.20	6.46	0.13	45	7.9	Medium	No
CB-Other-3	296	0.20	6.96	0.14	43	8.3	Medium	No
CB-Other-4	111	0.21	6.84	0.14	41	8.2	Medium	No
CB-Scrub/Shrub-1	88135	0.20	5.66	0.14	33	5.3	Low	No
CB-Scrub/Shrub-2	143694	0.20	6.51	0.14	37	6.8	Medium	No
CB-Scrub/Shrub-3	246703	0.21	7.33	0.14	41	8.4	Medium	No
CB-Scrub/Shrub-4	191150	0.21	8.28	0.14	42	9.8	High	Yes
CB-Unknown-1	1727	0.21	5.32	0.13	44	6.3	Medium	No
CB-Unknown-2	1935	0.21	5.95	0.13	44	7.1	Medium	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
O-Scrub/Shrub-3	209	0.22	6.47	0.13	41	7.5	Medium	No
O-Scrub/Shrub-4	96	0.22	6.62	0.13	44	8.2	Medium	No
O-Unknown-1	1236	0.28	1.60	0.12	26	1.5	Low	No
O-Unknown-2	62	0.27	1.48	0.13	36	1.8	Low	No
O-Unknown-3	15	0.29	3.52	0.13	38	4.9	Low	No
O-Unknown-4	7	0.34	3.87	0.12	40	6.6	Medium	No

GLU Nomenclature: Geology – Land Cover – Slope Category

Geology Categories:

CB Coarse Bedrock

CSI Coarse Sedimentary Impermeable

CSP Coarse Sedimentary Permeable

FB Fine Bedrock

FSI Fine Sedimentary Impermeable

FSP Fine Sedimentary Permeable

O Other

Slope Categories:

1 0%-10%

2 10% - 20%

3 20% - 40%

4 > 40%

APPENDIX 4

E_p Calculations (Including all Peaks Larger than 10% of Q_2)

E_P Calculation (Based on all Pre & Post Dev. Flows > than 10% Pre-Dev. Q_2)

Note: Calculations based on the simplified equation H.8.1 applied for each peak larger than 10% of Q_2.

10%-Q_2	0.211 (pre-development 10% of Q_2)	Total Pre-Dev. Dimensionless Work:	**213.78**
m:	0.308 (intermediate creeks)	Total Post-Dev. Dimensionless Work:	**125.26**
		Ep:	**58.6%**

Table - Node Total Inflow

	Date	Time	POC-pre flow (cfs)	Dimensionless Work
1	2/1/1993	17:00:00	5.805	4.025
2	2/10/1963	7:00:00	4.473	2.938
3	2/4/1994	9:00:00	4.078	2.622
4	10/20/2004	11:00:00	3.901	2.482
5	3/4/1978	15:00:00	3.699	2.322
6	1/4/1995	21:00:00	3.493	2.161
7	2/14/1998	17:00:00	3.322	2.028
8	1/29/1980	5:00:00	3.167	1.908
9	1/11/1980	6:00:00	3.127	1.878
10	12/25/1983	11:00:00	3.101	1.858
11	1/9/2005	18:00:00	3.060	1.826
12	2/15/1986	2:00:00	2.794	1.624
13	2/8/1993	3:00:00	2.792	1.622
14	12/6/1966	20:00:00	2.639	1.507
15	1/16/1978	22:00:00	2.639	1.507
16	1/29/1980	4:00:00	2.630	1.500
17	12/5/1966	8:00:00	2.627	1.498
18	12/5/1966	7:00:00	2.626	1.497
19	8/26/2007	9:00:00	2.616	1.490
20	11/9/2002	17:00:00	2.610	1.485
21	3/17/1982	18:00:00	2.607	1.483
22	9/10/1976	11:00:00	2.579	1.462
23	11/8/2002	17:00:00	2.522	1.419
24	8/26/2007	8:00:00	2.511	1.411
25	2/13/1992	6:00:00	2.482	1.389
26	2/16/1980	18:00:00	2.465	1.377
27	1/4/1995	20:00:00	2.421	1.344
28	11/30/1982	13:00:00	2.420	1.343
29	1/11/2005	3:00:00	2.384	1.317
30	2/8/1993	2:00:00	2.307	1.261
31	2/3/1998	17:00:00	2.290	1.248
32	2/14/1980	8:00:00	2.248	1.217
33	10/18/2004	9:00:00	2.118	1.122
34	1/23/1969	12:00:00	2.112	1.118
35	1/23/1969	11:00:00	2.112	1.118
36	12/19/1984	19:00:00	2.107	1.115
37	12/5/1966	9:00:00	2.094	1.105
38	12/5/1966	10:00:00	2.093	1.105
39	12/6/1966	19:00:00	2.085	1.099
40	1/9/1998	17:00:00	2.075	1.091
41	3/8/1975	10:00:00	2.061	1.081
42	12/29/2004	1:00:00	2.010	1.045
43	3/27/1991	3:00:00	1.989	1.029
44	1/7/1993	3:00:00	1.978	1.022
45	3/1/1983	17:00:00	1.965	1.013
46	1/3/1977	5:00:00	1.909	0.972
47	2/27/1983	17:00:00	1.881	0.953
48	12/9/1982	17:00:00	1.873	0.947
49	2/15/1986	5:00:00	1.870	0.945
50	3/1/1983	16:00:00	1.868	0.944
51	4/14/2003	17:00:00	1.862	0.939
52	3/1/1991	0:00:00	1.852	0.932
53	2/12/1992	18:00:00	1.818	0.908

Table - Node Total Inflow

Date	Time	POC-post flow (cfs)	Dimensionless Work
1/4/1995	21:00:00	3.638	2.275
2/1/1993	17:00:00	3.305	2.015
1/29/1980	5:00:00	3.201	1.934
12/6/1966	20:00:00	2.747	1.588
12/5/1966	8:00:00	2.695	1.549
2/10/1963	7:00:00	2.685	1.541
12/5/1966	7:00:00	2.650	1.515
2/4/1994	9:00:00	2.374	1.309
10/20/2004	11:00:00	2.245	1.215
3/4/1978	15:00:00	2.209	1.189
12/5/1966	9:00:00	2.184	1.170
12/5/1966	10:00:00	2.169	1.159
12/6/1966	19:00:00	2.153	1.148
2/15/1986	5:00:00	2.147	1.143
1/23/1969	12:00:00	2.025	1.055
2/14/1998	17:00:00	2.010	1.045
12/25/1983	11:00:00	1.978	1.022
3/5/1995	20:00:00	1.896	0.964
1/11/1980	6:00:00	1.896	0.963
11/22/1965	23:00:00	1.840	0.924
2/15/1986	2:00:00	1.836	0.921
1/9/2005	18:00:00	1.797	0.894
1/11/1980	7:00:00	1.764	0.870
1/23/1969	13:00:00	1.760	0.868
3/5/1995	21:00:00	1.747	0.859
8/26/2007	9:00:00	1.723	0.842
3/5/1995	16:00:00	1.709	0.832
2/20/1980	22:00:00	1.675	0.809
2/8/1993	3:00:00	1.665	0.802
11/9/2002	17:00:00	1.604	0.760
1/16/1978	22:00:00	1.602	0.759
3/17/1982	18:00:00	1.596	0.754
8/26/2007	8:00:00	1.587	0.748
1/29/1980	4:00:00	1.569	0.736
1/11/2005	3:00:00	1.546	0.720
1/4/1995	20:00:00	1.543	0.718
3/5/1995	22:00:00	1.534	0.712
3/5/1995	17:00:00	1.533	0.711
2/10/1963	14:00:00	1.530	0.710
11/8/2002	17:00:00	1.526	0.707
11/30/1982	13:00:00	1.508	0.695
2/13/1992	6:00:00	1.505	0.692
2/3/1998	17:00:00	1.408	0.627
2/16/1980	18:00:00	1.390	0.615
2/14/1980	8:00:00	1.373	0.604
1/23/1969	11:00:00	1.358	0.594
12/29/2004	1:00:00	1.351	0.590
9/10/1976	11:00:00	1.344	0.585
12/19/1984	19:00:00	1.307	0.561
3/1/1983	17:00:00	1.294	0.552
2/8/1993	2:00:00	1.287	0.548
1/9/1998	17:00:00	1.285	0.546
3/27/1991	3:00:00	1.271	0.537

54	1/4/1995	19:00:00	1.777	0.880
55	3/5/1995	20:00:00	1.763	0.870
56	4/3/1958	11:00:00	1.759	0.867
57	2/11/1962	23:00:00	1.726	0.844
58	1/14/1993	4:00:00	1.718	0.839
59	2/15/1986	3:00:00	1.681	0.813
60	11/11/1972	8:00:00	1.662	0.800
61	11/21/1963	5:00:00	1.653	0.794
62	1/18/1952	5:00:00	1.634	0.780
63	11/22/1965	23:00:00	1.633	0.780
64	12/17/1957	6:00:00	1.587	0.748
65	1/18/1952	4:00:00	1.585	0.747
66	1/23/1969	13:00:00	1.579	0.742
67	10/18/2005	10:00:00	1.563	0.732
68	2/18/1980	7:00:00	1.560	0.730
69	2/18/1980	5:00:00	1.559	0.729
70	12/5/1966	6:00:00	1.555	0.726
71	12/5/1966	5:00:00	1.554	0.725
72	3/5/1995	21:00:00	1.553	0.725
73	2/20/1980	22:00:00	1.551	0.724
74	3/5/1995	16:00:00	1.548	0.722
75	12/5/1966	4:00:00	1.548	0.722
76	11/15/1952	14:00:00	1.544	0.719
77	1/11/1980	7:00:00	1.536	0.713
78	2/11/1959	12:00:00	1.535	0.712
79	12/30/1951	7:00:00	1.529	0.709
80	9/10/1976	12:00:00	1.527	0.708
81	12/29/2004	2:00:00	1.519	0.702
82	11/16/1972	15:00:00	1.500	0.689
83	2/16/1980	19:00:00	1.497	0.687
84	3/21/1979	8:00:00	1.490	0.682
85	1/23/1969	10:00:00	1.483	0.677
86	3/15/1952	21:00:00	1.477	0.673
87	1/15/1978	0:00:00	1.475	0.672
88	12/18/1967	16:00:00	1.468	0.668
89	3/21/1979	7:00:00	1.466	0.666
90	2/26/2004	8:00:00	1.465	0.665
91	11/16/1972	13:00:00	1.464	0.665
92	3/2/1983	17:00:00	1.460	0.662
93	11/11/1985	10:00:00	1.459	0.661
94	2/20/1980	18:00:00	1.457	0.660
95	3/16/1958	8:00:00	1.453	0.658
96	1/10/1978	7:00:00	1.445	0.652
97	4/1/1982	12:00:00	1.436	0.646
98	3/4/1978	20:00:00	1.427	0.640
99	11/20/1983	11:00:00	1.425	0.639
100	11/25/1985	4:00:00	1.420	0.635
101	2/19/1980	21:00:00	1.411	0.630
102	1/12/1960	4:00:00	1.406	0.626
103	12/2/1961	9:00:00	1.404	0.625
104	1/16/1973	22:00:00	1.402	0.624
105	2/15/1992	14:00:00	1.399	0.621
106	11/14/1972	14:00:00	1.391	0.616
107	11/22/1965	18:00:00	1.383	0.611
108	1/11/2005	2:00:00	1.377	0.607
109	3/13/1967	16:00:00	1.369	0.602
110	2/6/1978	9:00:00	1.367	0.600
111	3/10/2006	17:00:00	1.363	0.597
112	2/27/1983	18:00:00	1.359	0.595
113	11/30/2007	22:00:00	1.359	0.595
114	1/5/1992	16:00:00	1.353	0.591
115	1/4/1974	19:00:00	1.352	0.590
116	11/29/1985	14:00:00	1.348	0.588
117	1/9/2005	20:00:00	1.348	0.588
118	12/22/1982	19:00:00	1.344	0.585

2/27/1983	17:00:00	1.262	0.532
1/7/1993	3:00:00	1.256	0.527
2/15/1986	3:00:00	1.254	0.526
1/23/1969	14:00:00	1.229	0.510
1/3/1977	5:00:00	1.226	0.508
3/8/1975	10:00:00	1.203	0.493
2/19/1980	22:00:00	1.178	0.477
1/29/1980	6:00:00	1.174	0.475
1/4/1995	19:00:00	1.169	0.472
3/1/1991	0:00:00	1.163	0.468
3/1/1983	16:00:00	1.157	0.464
4/14/2003	17:00:00	1.154	0.462
12/29/2004	2:00:00	1.151	0.460
12/5/1966	11:00:00	1.150	0.460
11/21/1963	5:00:00	1.148	0.458
1/11/1980	9:00:00	1.145	0.456
11/22/1965	22:00:00	1.135	0.450
12/5/1966	20:00:00	1.127	0.445
3/5/1995	18:00:00	1.116	0.438
12/9/1982	17:00:00	1.114	0.437
1/14/1993	4:00:00	1.114	0.437
3/5/1995	13:00:00	1.113	0.436
12/5/1966	13:00:00	1.109	0.434
12/5/1966	12:00:00	1.106	0.432
3/5/1995	15:00:00	1.094	0.424
3/5/1995	14:00:00	1.094	0.424
1/18/1952	5:00:00	1.088	0.420
12/5/1966	16:00:00	1.087	0.420
4/3/1958	11:00:00	1.072	0.411
1/23/1969	18:00:00	1.058	0.402
12/5/1966	19:00:00	1.047	0.395
12/2/1961	9:00:00	1.045	0.394
3/21/1979	8:00:00	1.019	0.378
3/16/1958	8:00:00	1.017	0.377
2/20/1980	21:00:00	1.016	0.376
1/18/1952	4:00:00	1.012	0.374
11/30/2007	22:00:00	1.009	0.372
12/30/1951	7:00:00	1.005	0.369
2/18/1980	7:00:00	0.993	0.362
1/23/1969	10:00:00	0.993	0.362
2/18/1980	5:00:00	0.992	0.361
2/12/1992	18:00:00	0.991	0.361
2/20/1980	18:00:00	0.991	0.361
11/22/1965	18:00:00	0.988	0.359
12/5/1966	6:00:00	0.987	0.359
2/27/1983	18:00:00	0.986	0.358
2/16/1980	19:00:00	0.984	0.357
12/5/1966	5:00:00	0.984	0.356
2/6/1969	10:00:00	0.983	0.356
3/2/1980	22:00:00	0.977	0.353
11/16/1972	15:00:00	0.969	0.348
11/15/1952	14:00:00	0.966	0.346
3/2/1983	17:00:00	0.963	0.344
11/11/1985	10:00:00	0.962	0.343
10/18/2004	9:00:00	0.962	0.343
1/15/1978	0:00:00	0.960	0.342
2/10/1963	18:00:00	0.957	0.341
11/25/1985	4:00:00	0.956	0.340
12/5/1966	4:00:00	0.955	0.339
3/21/1979	7:00:00	0.950	0.336
2/19/1980	21:00:00	0.942	0.332
2/11/1962	23:00:00	0.931	0.325
1/5/1992	16:00:00	0.924	0.321
12/2/1952	1:00:00	0.923	0.320
2/11/1959	12:00:00	0.919	0.318

119	1/4/1995	18:00:00	1.344	0.585
120	2/19/1980	7:00:00	1.343	0.584
121	3/5/1995	22:00:00	1.340	0.582
122	3/5/1995	17:00:00	1.337	0.581
123	12/2/1952	1:00:00	1.332	0.577
124	3/5/1995	12:00:00	1.331	0.577
125	2/4/1958	20:00:00	1.318	0.568
126	3/22/1958	5:00:00	1.314	0.565
127	1/11/1980	0:00:00	1.310	0.563
128	2/6/1969	10:00:00	1.297	0.554
129	10/29/1974	5:00:00	1.294	0.552
130	2/14/1995	10:00:00	1.291	0.550
131	3/15/1952	22:00:00	1.287	0.548
132	3/28/1998	17:00:00	1.282	0.544
133	2/10/1963	14:00:00	1.271	0.537
134	3/2/1980	22:00:00	1.255	0.527
135	11/22/1965	22:00:00	1.251	0.524
136	2/1/1996	3:00:00	1.236	0.514
137	12/25/2003	19:00:00	1.226	0.508
138	2/15/1980	9:00:00	1.221	0.505
139	2/8/1993	12:00:00	1.217	0.502
140	1/16/1952	15:00:00	1.189	0.485
141	2/4/1958	13:00:00	1.186	0.483
142	2/27/1983	16:00:00	1.180	0.479
143	6/1/1996	8:00:00	1.172	0.473
144	11/30/1982	10:00:00	1.168	0.471
145	3/24/1983	3:00:00	1.154	0.462
146	1/26/1956	21:00:00	1.152	0.461
147	12/9/1996	18:00:00	1.134	0.449
148	2/25/2003	17:00:00	1.122	0.442
149	1/13/1997	5:00:00	1.115	0.437
150	12/27/1984	18:00:00	1.103	0.430
151	1/18/1952	6:00:00	1.101	0.429
152	2/23/1998	17:00:00	1.099	0.427
153	2/15/1992	15:00:00	1.097	0.426
154	3/15/2003	17:00:00	1.091	0.423
155	3/23/1964	0:00:00	1.086	0.419
156	3/20/1991	8:00:00	1.071	0.410
157	11/22/1996	2:00:00	1.070	0.409
158	12/27/1984	3:00:00	1.065	0.407
159	12/29/1992	21:00:00	1.061	0.404
160	2/28/1991	16:00:00	1.053	0.399
161	10/27/2004	5:00:00	1.051	0.398
162	11/29/1985	13:00:00	1.047	0.395
163	3/22/1962	23:00:00	1.045	0.394
164	1/23/1969	14:00:00	1.045	0.394
165	12/4/1974	10:00:00	1.043	0.393
166	1/16/1978	23:00:00	1.042	0.392
167	12/25/1988	0:00:00	1.042	0.392
168	1/29/1980	6:00:00	1.034	0.387
169	1/15/1978	1:00:00	1.034	0.387
170	12/18/1967	17:00:00	1.034	0.387
171	1/15/1978	3:00:00	1.033	0.387
172	1/15/1978	2:00:00	1.032	0.386
173	12/5/1966	11:00:00	1.028	0.384
174	3/27/1991	2:00:00	1.028	0.384
175	12/29/1991	16:00:00	1.028	0.383
176	3/1/1991	1:00:00	1.027	0.383
177	12/5/1966	20:00:00	1.026	0.382
178	11/29/1970	16:00:00	1.026	0.382
179	12/30/1951	6:00:00	1.025	0.382
180	12/5/1966	13:00:00	1.025	0.381
181	12/5/1966	12:00:00	1.024	0.381
182	1/29/1980	3:00:00	1.022	0.380
183	12/5/1966	16:00:00	1.022	0.380

1/11/2005	2:00:00	0.916	0.316
3/5/1995	12:00:00	0.913	0.314
1/10/1978	7:00:00	0.911	0.313
1/9/2005	20:00:00	0.907	0.311
2/26/2004	8:00:00	0.907	0.311
11/29/1985	14:00:00	0.906	0.310
11/23/1965	2:00:00	0.897	0.305
3/22/1958	5:00:00	0.895	0.304
9/10/1976	12:00:00	0.889	0.300
11/30/1982	10:00:00	0.880	0.295
1/4/1995	18:00:00	0.877	0.293
2/19/1980	7:00:00	0.875	0.292
3/6/1995	0:00:00	0.870	0.289
2/11/1963	0:00:00	0.865	0.286
1/11/1980	0:00:00	0.857	0.281
3/15/1952	22:00:00	0.857	0.281
2/27/1983	16:00:00	0.855	0.281
11/16/1972	13:00:00	0.854	0.280
3/4/1978	20:00:00	0.850	0.277
2/4/1958	20:00:00	0.849	0.277
1/27/1956	4:00:00	0.841	0.272
12/22/1982	19:00:00	0.837	0.270
12/30/1951	10:00:00	0.835	0.269
11/22/1996	2:00:00	0.835	0.269
12/18/1967	16:00:00	0.831	0.267
1/16/1973	22:00:00	0.826	0.263
12/17/1957	6:00:00	0.823	0.262
11/23/1965	1:00:00	0.820	0.260
12/30/1951	11:00:00	0.819	0.260
1/26/1956	21:00:00	0.814	0.257
2/15/1986	4:00:00	0.813	0.256
10/29/1974	5:00:00	0.810	0.255
2/4/1958	13:00:00	0.809	0.254
11/23/1965	3:00:00	0.802	0.250
2/19/1993	19:00:00	0.801	0.249
2/15/1986	6:00:00	0.799	0.248
2/10/1963	15:00:00	0.797	0.247
2/1/1996	3:00:00	0.791	0.244
1/18/1952	6:00:00	0.789	0.243
2/14/1995	10:00:00	0.788	0.242
1/12/1960	4:00:00	0.780	0.238
2/15/1992	14:00:00	0.776	0.235
10/18/2005	10:00:00	0.774	0.234
3/15/1952	21:00:00	0.771	0.233
2/3/1958	21:00:00	0.770	0.232
2/15/1980	9:00:00	0.763	0.228
2/8/1993	12:00:00	0.763	0.228
1/16/1978	23:00:00	0.763	0.228
2/15/1992	15:00:00	0.754	0.223
1/13/1997	5:00:00	0.753	0.223
3/28/1998	17:00:00	0.752	0.222
3/10/2006	17:00:00	0.750	0.221
11/29/1985	13:00:00	0.748	0.220
12/30/1951	6:00:00	0.747	0.219
1/16/1952	15:00:00	0.745	0.218
1/13/1957	7:00:00	0.742	0.217
3/1/1991	1:00:00	0.738	0.215
6/1/1996	8:00:00	0.737	0.214
12/6/1966	21:00:00	0.728	0.209
12/25/2003	19:00:00	0.723	0.206
1/8/1974	1:00:00	0.719	0.204
3/1/1983	18:00:00	0.717	0.203
3/1/1970	2:00:00	0.716	0.202
3/5/1995	23:00:00	0.715	0.202
2/23/1998	17:00:00	0.714	0.201

184	9/25/1986	6:00:00	1.018	0.378
185	1/13/1957	7:00:00	1.016	0.376
186	1/12/1969	8:00:00	1.011	0.373
187	1/1/1982	11:00:00	1.009	0.372
188	2/19/1980	22:00:00	1.004	0.369
189	3/8/1975	11:00:00	1.000	0.366
190	1/11/1980	9:00:00	0.999	0.366
191	1/16/1993	7:00:00	0.993	0.362
192	2/11/1959	13:00:00	0.990	0.360
193	3/1/1970	2:00:00	0.987	0.359
194	1/10/1998	17:00:00	0.985	0.357
195	2/6/1998	17:00:00	0.980	0.354
196	1/8/1974	1:00:00	0.971	0.349
197	1/2/2006	14:00:00	0.968	0.347
198	1/19/1969	10:00:00	0.968	0.347
199	1/13/1993	21:00:00	0.968	0.347
200	1/23/1969	18:00:00	0.965	0.345
201	1/26/1956	20:00:00	0.964	0.345
202	2/24/1969	3:00:00	0.964	0.344
203	1/25/1967	0:00:00	0.960	0.342
204	1/22/1969	20:00:00	0.959	0.341
205	2/19/1993	19:00:00	0.954	0.339
206	1/16/1978	20:00:00	0.953	0.338
207	1/29/1980	2:00:00	0.952	0.338
208	12/5/1966	19:00:00	0.952	0.337
209	3/16/2003	17:00:00	0.952	0.337
210	1/9/1978	21:00:00	0.951	0.337
211	1/24/1967	19:00:00	0.951	0.337
212	2/10/1982	17:00:00	0.950	0.336
213	11/29/1970	15:00:00	0.950	0.336
214	2/15/1986	4:00:00	0.948	0.335
215	3/8/1974	12:00:00	0.947	0.335
216	3/13/1967	23:00:00	0.947	0.334
217	1/4/1974	21:00:00	0.944	0.333
218	3/13/1967	18:00:00	0.943	0.332
219	2/20/1980	21:00:00	0.941	0.331
220	2/21/2005	11:00:00	0.940	0.330
221	1/28/1980	21:00:00	0.939	0.329
222	3/5/1970	1:00:00	0.935	0.327
223	1/9/2005	21:00:00	0.935	0.327
224	11/16/1965	21:00:00	0.933	0.326
225	2/19/2007	16:00:00	0.933	0.326
226	1/12/1969	7:00:00	0.932	0.326
227	1/13/1957	6:00:00	0.931	0.325
228	2/10/1982	13:00:00	0.929	0.324
229	3/1/1983	18:00:00	0.927	0.323
230	3/27/1991	4:00:00	0.923	0.320
231	3/5/1995	18:00:00	0.912	0.313
232	2/19/1980	17:00:00	0.909	0.312
233	3/5/1995	13:00:00	0.908	0.311
234	3/5/1995	15:00:00	0.907	0.311
235	3/5/1995	14:00:00	0.906	0.310
236	3/5/1995	11:00:00	0.898	0.305
237	3/23/1964	1:00:00	0.894	0.303
238	3/8/1968	11:00:00	0.890	0.301
239	3/5/1995	8:00:00	0.888	0.299
240	3/16/1958	7:00:00	0.881	0.295
241	2/22/1998	17:00:00	0.874	0.291
242	1/5/1992	15:00:00	0.872	0.290
243	1/7/1993	10:00:00	0.871	0.290
244	11/24/1984	18:00:00	0.870	0.289
245	12/22/1971	20:00:00	0.867	0.287
246	11/29/1970	23:00:00	0.867	0.287
247	2/18/1980	3:00:00	0.864	0.286
248	2/4/1958	14:00:00	0.863	0.285

11/20/1983	11:00:00	0.712	0.200
1/15/1978	1:00:00	0.711	0.199
2/24/1969	3:00:00	0.709	0.199
1/19/1969	10:00:00	0.709	0.199
12/27/1984	18:00:00	0.708	0.198
1/15/1978	3:00:00	0.707	0.198
2/10/1963	13:00:00	0.704	0.196
1/9/2005	21:00:00	0.701	0.194
3/20/1991	8:00:00	0.701	0.194
1/15/1978	2:00:00	0.700	0.194
2/11/1959	13:00:00	0.700	0.194
11/23/1965	4:00:00	0.698	0.193
3/27/1991	4:00:00	0.698	0.193
1/11/1980	8:00:00	0.694	0.190
3/5/1995	19:00:00	0.693	0.190
2/4/1958	14:00:00	0.693	0.190
3/8/1975	11:00:00	0.691	0.189
2/20/1980	23:00:00	0.691	0.189
1/11/2005	5:00:00	0.689	0.188
2/15/1986	8:00:00	0.688	0.187
1/1/1982	11:00:00	0.686	0.186
12/18/1967	17:00:00	0.685	0.186
10/27/2004	5:00:00	0.683	0.185
11/29/1970	16:00:00	0.681	0.184
3/8/1974	12:00:00	0.680	0.183
12/4/1974	10:00:00	0.677	0.182
1/16/1993	7:00:00	0.674	0.180
1/13/1957	6:00:00	0.672	0.179
1/11/1980	10:00:00	0.671	0.179
1/10/1998	17:00:00	0.668	0.177
3/24/1983	3:00:00	0.668	0.177
2/28/1991	16:00:00	0.667	0.176
3/16/1958	7:00:00	0.666	0.176
2/18/1980	8:00:00	0.665	0.175
11/22/1996	3:00:00	0.662	0.174
1/29/1980	3:00:00	0.662	0.173
3/5/1995	8:00:00	0.660	0.173
3/5/1995	11:00:00	0.659	0.172
1/26/1956	20:00:00	0.658	0.172
3/23/1964	1:00:00	0.658	0.171
2/21/2005	11:00:00	0.655	0.170
2/15/1980	10:00:00	0.654	0.170
2/19/1980	23:00:00	0.654	0.170
3/27/1991	2:00:00	0.650	0.167
12/27/1984	3:00:00	0.648	0.166
1/11/2005	7:00:00	0.644	0.164
1/11/1980	11:00:00	0.642	0.163
1/5/1992	15:00:00	0.642	0.163
12/29/1992	21:00:00	0.639	0.162
12/25/1988	0:00:00	0.634	0.159
1/29/1980	2:00:00	0.632	0.158
11/22/1965	21:00:00	0.631	0.158
12/6/1966	22:00:00	0.629	0.156
12/5/1966	21:00:00	0.628	0.156
12/6/1966	23:00:00	0.628	0.156
4/1/1982	12:00:00	0.626	0.155
3/16/2003	17:00:00	0.626	0.155
3/13/1996	7:00:00	0.625	0.154
12/29/1991	16:00:00	0.620	0.152
12/5/1966	17:00:00	0.619	0.151
12/6/1966	18:00:00	0.617	0.151
2/4/1958	5:00:00	0.616	0.150
1/25/1967	0:00:00	0.616	0.150
3/23/1964	0:00:00	0.615	0.149
3/22/1962	23:00:00	0.615	0.149

249	2/8/1983	1:00:00	0.858	0.282
250	2/10/1963	13:00:00	0.857	0.281
251	3/4/1978	14:00:00	0.856	0.281
252	2/15/1980	10:00:00	0.850	0.278
253	2/19/1969	14:00:00	0.850	0.277
254	3/28/1979	0:00:00	0.848	0.276
255	8/17/1977	3:00:00	0.847	0.276
256	12/5/1966	3:00:00	0.846	0.275
257	1/29/1980	17:00:00	0.844	0.274
258	3/5/1995	7:00:00	0.839	0.271
259	2/9/1981	6:00:00	0.838	0.271
260	1/1/1982	10:00:00	0.838	0.270
261	3/14/1982	17:00:00	0.837	0.270
262	3/23/1973	22:00:00	0.837	0.270
263	11/13/1978	22:00:00	0.824	0.262
264	1/9/1980	12:00:00	0.822	0.262
265	3/15/1986	23:00:00	0.820	0.260
266	3/1/1991	4:00:00	0.816	0.258
267	1/29/1957	5:00:00	0.812	0.256
268	12/16/2002	17:00:00	0.810	0.254
269	1/2/2006	17:00:00	0.809	0.254
270	2/8/1998	17:00:00	0.808	0.253
271	3/1/1981	12:00:00	0.806	0.252
272	12/4/1972	16:00:00	0.806	0.252
273	2/12/2003	17:00:00	0.803	0.251
274	2/18/1969	11:00:00	0.801	0.249
275	2/21/1979	6:00:00	0.796	0.246
276	1/6/1993	14:00:00	0.792	0.244
277	1/12/1993	23:00:00	0.791	0.244
278	3/8/1975	9:00:00	0.790	0.243
279	2/3/1958	21:00:00	0.789	0.243
280	5/12/1998	17:00:00	0.785	0.241
281	11/22/1996	3:00:00	0.782	0.239
282	1/16/1973	21:00:00	0.780	0.238
283	1/9/2005	5:00:00	0.780	0.237
284	1/11/1980	3:00:00	0.777	0.236
285	3/1/1957	0:00:00	0.777	0.236
286	12/13/1965	17:00:00	0.777	0.236
287	4/30/1983	4:00:00	0.775	0.235
288	2/22/1969	3:00:00	0.766	0.230
289	3/11/1995	23:00:00	0.764	0.229
290	12/25/1968	18:00:00	0.761	0.227
291	11/22/1965	21:00:00	0.759	0.226
292	2/10/1963	18:00:00	0.758	0.225
293	12/3/1966	18:00:00	0.756	0.225
294	1/18/1955	17:00:00	0.752	0.222
295	3/13/1996	7:00:00	0.743	0.217
296	1/7/1957	15:00:00	0.729	0.210
297	2/8/1966	0:00:00	0.726	0.208
298	1/4/1995	17:00:00	0.726	0.208
299	1/29/1981	18:00:00	0.726	0.208
300	12/3/1966	17:00:00	0.723	0.206
301	1/5/1992	17:00:00	0.723	0.206
302	3/22/1954	14:00:00	0.722	0.206
303	3/16/1952	1:00:00	0.716	0.203
304	10/2/1983	2:00:00	0.713	0.201
305	10/20/2004	12:00:00	0.709	0.199
306	2/4/1958	5:00:00	0.709	0.199
307	2/26/2004	9:00:00	0.708	0.198
308	11/17/1964	18:00:00	0.707	0.197
309	11/19/1982	5:00:00	0.703	0.196
310	12/5/1951	5:00:00	0.700	0.194
311	12/17/1978	21:00:00	0.700	0.194
312	1/6/1979	4:00:00	0.697	0.192
313	3/21/1979	6:00:00	0.697	0.192

12/6/1966	15:00:00	0.613	0.148
1/4/1995	22:00:00	0.612	0.148
12/5/1966	14:00:00	0.611	0.147
1/15/1978	5:00:00	0.610	0.147
1/22/1969	20:00:00	0.609	0.147
11/11/1972	8:00:00	0.609	0.146
11/14/1972	14:00:00	0.608	0.146
2/25/2003	17:00:00	0.608	0.146
12/30/1951	8:00:00	0.606	0.145
2/19/1980	17:00:00	0.606	0.145
12/6/1966	0:00:00	0.595	0.139
2/28/1970	18:00:00	0.595	0.139
1/9/1978	21:00:00	0.594	0.139
2/6/1978	9:00:00	0.593	0.139
3/11/1995	23:00:00	0.593	0.138
1/7/1993	10:00:00	0.593	0.138
1/4/1974	21:00:00	0.592	0.138
3/1/1991	4:00:00	0.592	0.138
3/11/1995	9:00:00	0.590	0.137
11/29/1970	23:00:00	0.589	0.136
12/17/1978	21:00:00	0.587	0.136
9/25/1986	6:00:00	0.587	0.135
1/16/1978	20:00:00	0.586	0.135
1/2/2006	14:00:00	0.585	0.134
2/18/1980	3:00:00	0.583	0.133
2/6/1998	17:00:00	0.583	0.133
2/10/1963	20:00:00	0.582	0.133
1/11/1980	3:00:00	0.582	0.133
1/11/1980	13:00:00	0.581	0.133
12/5/1966	15:00:00	0.581	0.132
1/5/1992	17:00:00	0.578	0.131
3/13/1967	23:00:00	0.576	0.130
1/27/1956	3:00:00	0.576	0.130
2/10/1982	17:00:00	0.576	0.130
10/20/2004	12:00:00	0.571	0.127
3/1/1970	4:00:00	0.567	0.126
3/1/1970	3:00:00	0.566	0.125
1/6/1979	4:00:00	0.564	0.124
2/20/1980	4:00:00	0.564	0.124
2/2/1960	1:00:00	0.564	0.124
1/6/1993	14:00:00	0.561	0.123
3/5/1995	7:00:00	0.560	0.122
1/2/2006	17:00:00	0.558	0.121
1/20/1962	18:00:00	0.555	0.120
11/29/1970	15:00:00	0.555	0.120
12/3/1966	18:00:00	0.555	0.120
1/7/1957	15:00:00	0.554	0.119
12/6/1966	17:00:00	0.554	0.119
2/17/1994	13:00:00	0.553	0.119
1/16/1993	9:00:00	0.553	0.119
12/6/1966	14:00:00	0.550	0.117
1/24/1967	19:00:00	0.548	0.116
11/23/1965	0:00:00	0.546	0.115
1/4/1974	19:00:00	0.544	0.114
1/13/1993	21:00:00	0.541	0.113
12/22/1971	20:00:00	0.540	0.113
5/8/1977	21:00:00	0.537	0.111
3/22/1954	14:00:00	0.537	0.111
1/18/1955	17:00:00	0.536	0.111
3/13/1967	16:00:00	0.536	0.110
2/21/2005	14:00:00	0.534	0.110
11/16/1965	21:00:00	0.533	0.109
2/22/1998	17:00:00	0.532	0.109
3/16/1952	1:00:00	0.530	0.108
12/5/1966	23:00:00	0.528	0.107

314	12/30/1951	2:00:00	0.697	0.192
315	12/30/1951	10:00:00	0.697	0.192
316	1/16/1952	14:00:00	0.694	0.190
317	2/11/1963	0:00:00	0.693	0.190
318	1/16/1993	9:00:00	0.693	0.190
319	3/6/1995	0:00:00	0.693	0.190
320	2/3/2008	12:00:00	0.689	0.188
321	2/28/1970	18:00:00	0.685	0.186
322	11/23/1965	2:00:00	0.684	0.185
323	12/6/1998	6:00:00	0.681	0.184
324	3/1/1970	4:00:00	0.679	0.183
325	1/5/2008	6:00:00	0.675	0.180
326	1/7/1995	19:00:00	0.671	0.178
327	10/18/2004	10:00:00	0.670	0.178
328	5/8/1977	21:00:00	0.669	0.177
329	12/9/1996	19:00:00	0.668	0.177
330	11/21/1978	18:00:00	0.666	0.176
331	10/18/2004	11:00:00	0.661	0.173
332	2/21/2005	14:00:00	0.660	0.173
333	12/30/1951	11:00:00	0.655	0.170
334	1/27/1956	4:00:00	0.651	0.168
335	3/1/1970	3:00:00	0.651	0.168
336	1/31/1996	17:00:00	0.650	0.167
337	3/12/1986	14:00:00	0.649	0.167
338	1/28/1980	8:00:00	0.649	0.167
339	12/3/1966	16:00:00	0.645	0.165
340	10/20/2004	15:00:00	0.640	0.162
341	9/18/1965	16:00:00	0.640	0.162
342	12/30/1951	0:00:00	0.636	0.160
343	3/11/1995	9:00:00	0.627	0.156
344	11/23/1973	0:00:00	0.626	0.155
345	12/29/1965	20:00:00	0.624	0.154
346	10/20/1979	11:00:00	0.624	0.154
347	1/31/1996	21:00:00	0.622	0.153
348	4/1/1958	18:00:00	0.622	0.153
349	4/1/1958	16:00:00	0.621	0.153
350	12/18/1978	16:00:00	0.613	0.149
351	9/25/1986	5:00:00	0.613	0.148
352	12/30/1951	5:00:00	0.605	0.144
353	11/23/1965	1:00:00	0.598	0.141
354	12/27/1964	15:00:00	0.598	0.141
355	11/25/2001	17:00:00	0.596	0.140
356	11/21/1963	4:00:00	0.593	0.138
357	2/11/1973	6:00:00	0.593	0.138
358	2/14/1995	9:00:00	0.587	0.135
359	11/23/1965	3:00:00	0.584	0.134
360	1/21/1964	12:00:00	0.579	0.131
361	3/1/1991	3:00:00	0.573	0.128
362	1/18/1952	7:00:00	0.571	0.128
363	11/16/1952	3:00:00	0.570	0.127
364	12/5/1951	4:00:00	0.569	0.126
365	3/21/1958	23:00:00	0.567	0.125
366	3/1/1953	22:00:00	0.563	0.123
367	1/26/1956	23:00:00	0.558	0.121
368	12/30/1951	19:00:00	0.544	0.114
369	3/25/1998	17:00:00	0.535	0.110
370	1/19/1954	19:00:00	0.530	0.108
371	1/20/1962	19:00:00	0.530	0.108
372	1/14/1993	5:00:00	0.524	0.105
373	12/6/1966	21:00:00	0.522	0.104
374	12/30/1951	3:00:00	0.517	0.102
375	12/24/1988	23:00:00	0.517	0.102
376	1/27/1956	3:00:00	0.513	0.100
377	1/16/1993	12:00:00	0.511	0.099
378	1/27/1956	1:00:00	0.510	0.099

12/29/1965	20:00:00	0.527	0.107
1/12/1993	23:00:00	0.527	0.106
3/1/1991	8:00:00	0.526	0.106
2/3/2008	12:00:00	0.524	0.105
12/3/1966	17:00:00	0.523	0.104
1/20/1962	19:00:00	0.523	0.104
2/8/1998	17:00:00	0.522	0.104
12/4/1987	23:00:00	0.522	0.104
3/5/1970	1:00:00	0.522	0.104
3/15/2003	17:00:00	0.521	0.104
3/1/1981	12:00:00	0.519	0.103
3/4/1978	14:00:00	0.516	0.101
2/26/2004	9:00:00	0.511	0.099
11/30/2007	15:00:00	0.511	0.099
12/30/1951	2:00:00	0.509	0.098
1/9/2005	5:00:00	0.506	0.097
1/29/1980	17:00:00	0.506	0.096
4/1/1958	18:00:00	0.505	0.096
11/21/1963	4:00:00	0.504	0.096
1/12/1969	8:00:00	0.504	0.096
3/13/1967	18:00:00	0.502	0.095
1/5/2008	6:00:00	0.499	0.094
1/15/1978	4:00:00	0.494	0.091
1/1/1982	10:00:00	0.492	0.090
12/5/1951	5:00:00	0.492	0.090
1/11/2005	4:00:00	0.491	0.090
1/6/1979	2:00:00	0.490	0.089
1/28/1980	21:00:00	0.486	0.087
1/29/1957	5:00:00	0.485	0.087
11/24/1984	18:00:00	0.477	0.084
4/1/1958	16:00:00	0.477	0.083
3/12/1986	14:00:00	0.477	0.083
1/18/1952	7:00:00	0.476	0.083
1/31/1996	21:00:00	0.476	0.083
1/4/1995	17:00:00	0.472	0.082
3/17/1982	19:00:00	0.471	0.081
1/14/1993	5:00:00	0.471	0.081
12/30/1951	5:00:00	0.467	0.079
3/21/1979	6:00:00	0.466	0.079
1/26/1956	23:00:00	0.465	0.079
1/9/1980	12:00:00	0.465	0.078
2/19/1969	14:00:00	0.462	0.077
1/6/1979	0:00:00	0.462	0.077
2/12/2003	17:00:00	0.458	0.075
3/1/1991	3:00:00	0.457	0.075
12/30/1951	19:00:00	0.456	0.074
3/28/1979	0:00:00	0.454	0.074
2/4/1958	4:00:00	0.452	0.073
2/8/1983	1:00:00	0.451	0.072
2/27/1983	13:00:00	0.450	0.072
2/2/1960	0:00:00	0.449	0.072
2/1/1996	4:00:00	0.446	0.070
12/3/1966	16:00:00	0.444	0.070
1/19/1969	11:00:00	0.442	0.069
1/16/1993	12:00:00	0.442	0.068
12/29/2004	3:00:00	0.441	0.068
1/7/1957	16:00:00	0.438	0.067
11/29/1985	15:00:00	0.437	0.067
5/8/1977	20:00:00	0.436	0.066
12/5/1966	3:00:00	0.435	0.066
11/22/1965	17:00:00	0.434	0.065
1/27/1956	1:00:00	0.434	0.065
1/16/1993	11:00:00	0.434	0.065
3/5/1995	9:00:00	0.433	0.065
2/11/1973	6:00:00	0.432	0.064

379	1/19/1969	11:00:00	0.510	0.099
380	2/18/1980	8:00:00	0.510	0.098
381	2/18/1980	6:00:00	0.510	0.098
382	12/18/1967	18:00:00	0.510	0.098
383	1/15/1978	4:00:00	0.509	0.098
384	11/29/1985	15:00:00	0.509	0.098
385	1/16/1993	11:00:00	0.508	0.098
386	2/24/1969	4:00:00	0.506	0.097
387	3/17/1982	19:00:00	0.506	0.097
388	2/1/1996	4:00:00	0.505	0.096
389	11/29/1970	17:00:00	0.505	0.096
390	2/25/1969	21:00:00	0.505	0.096
391	2/25/1969	17:00:00	0.504	0.096
392	2/25/1969	20:00:00	0.504	0.096
393	1/16/1978	21:00:00	0.504	0.096
394	2/25/1969	16:00:00	0.504	0.096
395	12/5/1966	21:00:00	0.504	0.096
396	1/7/1957	16:00:00	0.503	0.096
397	12/18/1967	19:00:00	0.503	0.095
398	12/5/1966	17:00:00	0.502	0.095
399	1/9/1978	22:00:00	0.502	0.095
400	1/15/1978	5:00:00	0.501	0.094
401	12/5/1966	14:00:00	0.501	0.094
402	2/10/1963	15:00:00	0.501	0.094
403	3/20/1991	9:00:00	0.501	0.094
404	12/6/1966	22:00:00	0.501	0.094
405	2/24/1969	2:00:00	0.501	0.094
406	2/20/1980	23:00:00	0.501	0.094
407	12/6/1966	23:00:00	0.501	0.094
408	2/24/1969	1:00:00	0.500	0.094
409	12/6/1966	18:00:00	0.500	0.094
410	12/6/1966	15:00:00	0.499	0.094
411	2/18/1980	4:00:00	0.499	0.093
412	3/5/1995	23:00:00	0.499	0.093
413	1/8/1974	3:00:00	0.499	0.093
414	11/29/1970	18:00:00	0.497	0.093
415	2/10/1982	20:00:00	0.497	0.093
416	2/7/1978	19:00:00	0.496	0.092
417	12/6/1966	0:00:00	0.496	0.092
418	1/7/1993	2:00:00	0.495	0.092
419	2/25/1969	19:00:00	0.494	0.091
420	1/29/1983	4:00:00	0.494	0.091
421	12/27/1971	18:00:00	0.494	0.091
422	1/8/1974	0:00:00	0.493	0.091
423	1/7/1974	16:00:00	0.493	0.091
424	12/5/1966	15:00:00	0.493	0.091
425	1/12/1969	9:00:00	0.492	0.091
426	1/11/2005	4:00:00	0.492	0.090
427	3/5/1995	19:00:00	0.492	0.090
428	1/19/1969	9:00:00	0.490	0.090
429	1/12/1969	13:00:00	0.490	0.089
430	1/24/1967	21:00:00	0.490	0.089
431	1/28/1980	22:00:00	0.489	0.089
432	12/6/1966	17:00:00	0.489	0.089
433	12/6/1966	14:00:00	0.488	0.089
434	2/24/1969	7:00:00	0.488	0.088
435	3/8/1974	10:00:00	0.488	0.088
436	3/2/1983	20:00:00	0.488	0.088
437	3/28/1979	1:00:00	0.487	0.088
438	3/5/1970	2:00:00	0.487	0.088
439	12/25/1971	21:00:00	0.487	0.088
440	12/21/1970	8:00:00	0.487	0.088
441	12/27/1971	16:00:00	0.487	0.088
442	1/28/1980	23:00:00	0.486	0.088
443	1/31/1996	18:00:00	0.486	0.088

11/22/1965	15:00:00	0.432	0.064
2/24/1969	4:00:00	0.431	0.064
2/25/1969	21:00:00	0.431	0.064
11/19/1982	5:00:00	0.426	0.062
2/25/1969	20:00:00	0.426	0.062
3/15/1984	6:00:00	0.425	0.062
2/15/1992	16:00:00	0.424	0.061
2/18/1980	6:00:00	0.424	0.061
2/25/1969	17:00:00	0.423	0.061
12/18/1978	16:00:00	0.422	0.060
3/23/1973	22:00:00	0.421	0.060
1/2/2006	15:00:00	0.421	0.060
3/5/1995	10:00:00	0.420	0.060
5/12/1998	17:00:00	0.420	0.059
12/6/1966	12:00:00	0.419	0.059
3/11/1995	4:00:00	0.417	0.058
3/16/1958	6:00:00	0.417	0.058
12/30/1951	3:00:00	0.415	0.058
3/17/1982	20:00:00	0.413	0.057
3/2/1983	20:00:00	0.412	0.056
1/27/1956	2:00:00	0.412	0.056
1/23/1967	1:00:00	0.412	0.056
1/27/1956	5:00:00	0.412	0.056
10/20/2004	15:00:00	0.411	0.056
3/22/1954	18:00:00	0.409	0.055
1/19/1954	19:00:00	0.408	0.055
3/20/1991	9:00:00	0.408	0.055
12/18/1967	18:00:00	0.408	0.055
3/28/2006	23:00:00	0.407	0.054
2/24/1969	2:00:00	0.406	0.054
2/12/1992	19:00:00	0.405	0.054
2/18/1980	4:00:00	0.403	0.053
11/29/1970	17:00:00	0.402	0.052
12/30/1951	9:00:00	0.401	0.052
1/16/1978	21:00:00	0.401	0.052
12/18/1967	19:00:00	0.400	0.052
2/25/1969	16:00:00	0.396	0.050
2/6/1969	9:00:00	0.396	0.050
11/30/1982	14:00:00	0.394	0.049
1/16/1952	14:00:00	0.393	0.049
2/25/1969	19:00:00	0.393	0.049
3/22/2005	22:00:00	0.393	0.049
2/25/1969	15:00:00	0.392	0.049
1/3/2005	10:00:00	0.392	0.049
11/29/1970	18:00:00	0.391	0.048
11/23/1973	0:00:00	0.391	0.048
1/8/1974	3:00:00	0.391	0.048
2/16/1980	20:00:00	0.390	0.048
1/7/1993	2:00:00	0.390	0.048
2/21/2005	13:00:00	0.390	0.048
11/16/1952	3:00:00	0.390	0.048
1/9/2005	19:00:00	0.389	0.047
1/8/1974	0:00:00	0.388	0.047
4/8/1965	19:00:00	0.385	0.046
3/8/1974	10:00:00	0.384	0.046
1/9/2005	10:00:00	0.383	0.045
3/21/1958	23:00:00	0.383	0.045
2/24/1969	7:00:00	0.382	0.045
1/9/1978	22:00:00	0.381	0.044
3/1/1991	5:00:00	0.381	0.044
1/6/1993	17:00:00	0.380	0.044
12/16/2002	17:00:00	0.380	0.044
10/18/2004	10:00:00	0.380	0.044
10/18/2004	11:00:00	0.379	0.044
3/2/1983	19:00:00	0.379	0.044

444	4/9/1965	23:00:00	0.486	0.088
445	2/10/1982	19:00:00	0.486	0.088
446	4/9/1965	22:00:00	0.485	0.087
447	1/14/1978	23:00:00	0.485	0.087
448	2/24/1969	0:00:00	0.485	0.087
449	3/17/1982	20:00:00	0.485	0.087
450	12/5/1966	23:00:00	0.485	0.087
451	12/6/1966	12:00:00	0.484	0.087
452	2/10/1982	23:00:00	0.484	0.087
453	3/5/1995	9:00:00	0.484	0.087
454	2/19/1980	23:00:00	0.484	0.087
455	1/11/1980	8:00:00	0.483	0.086
456	2/25/1969	15:00:00	0.482	0.086
457	1/11/1980	10:00:00	0.482	0.086
458	11/23/1965	4:00:00	0.482	0.086
459	2/7/1978	18:00:00	0.481	0.085
460	4/8/1965	19:00:00	0.479	0.085
461	3/5/1995	10:00:00	0.478	0.084
462	3/24/1977	20:00:00	0.478	0.084
463	3/2/1983	19:00:00	0.478	0.084
464	1/29/1980	1:00:00	0.478	0.084
465	2/8/1976	0:00:00	0.477	0.084
466	1/11/2005	5:00:00	0.477	0.084
467	1/11/2005	7:00:00	0.477	0.084
468	2/15/1992	16:00:00	0.477	0.084
469	1/20/1962	18:00:00	0.476	0.083
470	1/12/1969	12:00:00	0.475	0.083
471	4/8/1965	18:00:00	0.475	0.083
472	1/11/1980	11:00:00	0.475	0.083
473	2/8/1976	4:00:00	0.474	0.082
474	11/17/1964	19:00:00	0.472	0.081
475	2/8/1976	2:00:00	0.472	0.081
476	2/9/1981	8:00:00	0.471	0.081
477	11/29/1985	10:00:00	0.470	0.081
478	3/8/1974	9:00:00	0.470	0.081
479	1/14/1978	21:00:00	0.469	0.080
480	3/2/1978	8:00:00	0.469	0.080
481	2/16/1980	22:00:00	0.468	0.080
482	2/16/1980	20:00:00	0.468	0.080
483	1/27/1956	2:00:00	0.468	0.080
484	4/9/1965	21:00:00	0.467	0.079
485	2/21/2005	13:00:00	0.466	0.079
486	1/2/2006	15:00:00	0.466	0.079
487	2/5/1976	13:00:00	0.466	0.079
488	1/11/1980	13:00:00	0.466	0.079
489	11/14/1972	15:00:00	0.465	0.078
490	2/16/1980	21:00:00	0.463	0.078
491	11/14/1972	16:00:00	0.462	0.077
492	2/20/1980	4:00:00	0.461	0.077
493	12/4/1987	23:00:00	0.461	0.077
494	1/9/1980	6:00:00	0.460	0.076
495	2/19/1962	20:00:00	0.458	0.076
496	3/10/1975	15:00:00	0.458	0.075
497	1/6/1979	0:00:00	0.457	0.075
498	1/6/2008	23:00:00	0.457	0.075
499	1/6/1993	8:00:00	0.455	0.074
500	3/24/1977	19:00:00	0.454	0.074
501	3/1/1981	17:00:00	0.450	0.072
502	3/1/1978	4:00:00	0.446	0.070
503	5/8/1977	20:00:00	0.445	0.070
504	2/15/1986	8:00:00	0.445	0.070
505	2/15/1986	6:00:00	0.444	0.069
506	2/29/1960	9:00:00	0.442	0.069
507	1/26/1999	13:00:00	0.441	0.068
508	1/7/1957	14:00:00	0.441	0.068

11/21/1996	21:00:00	0.379	0.043
1/7/1974	16:00:00	0.377	0.043
2/14/1998	16:00:00	0.376	0.043
4/9/1965	23:00:00	0.375	0.042
2/9/1981	6:00:00	0.374	0.042
1/26/1956	22:00:00	0.372	0.041
12/4/1972	16:00:00	0.372	0.041
3/19/1991	4:00:00	0.371	0.040
10/27/2004	7:00:00	0.370	0.040
2/16/1980	22:00:00	0.370	0.040
12/25/1971	21:00:00	0.369	0.040
2/19/1980	2:00:00	0.368	0.040
2/16/1980	21:00:00	0.366	0.039
1/7/1993	0:00:00	0.364	0.038
3/1/1981	17:00:00	0.364	0.038
1/27/1956	8:00:00	0.363	0.038
3/1/1991	9:00:00	0.361	0.037
2/24/1969	1:00:00	0.359	0.036
12/13/1965	17:00:00	0.359	0.036
3/22/1958	3:00:00	0.356	0.035
3/5/1970	2:00:00	0.354	0.035
12/27/1971	18:00:00	0.352	0.034
3/1/1957	0:00:00	0.351	0.033
2/19/1962	20:00:00	0.350	0.033
1/16/1952	16:00:00	0.349	0.033
1/24/1967	21:00:00	0.349	0.033
3/28/1979	1:00:00	0.348	0.032
1/29/1957	9:00:00	0.347	0.032
2/13/1954	20:00:00	0.347	0.032
2/29/1960	9:00:00	0.346	0.032
11/25/2001	17:00:00	0.345	0.032
11/21/1978	18:00:00	0.344	0.031
2/10/1982	20:00:00	0.344	0.031
1/7/2008	0:00:00	0.343	0.031
2/8/1976	4:00:00	0.343	0.031
3/1/1991	7:00:00	0.341	0.030
1/16/1993	8:00:00	0.341	0.030
3/1/1991	6:00:00	0.341	0.030
2/19/1993	18:00:00	0.340	0.030
3/8/1974	9:00:00	0.340	0.030
2/8/1976	2:00:00	0.339	0.029
12/21/1970	8:00:00	0.339	0.029
1/6/2008	7:00:00	0.338	0.029
12/4/1974	9:00:00	0.338	0.029
2/19/1980	3:00:00	0.338	0.029
3/22/1954	12:00:00	0.337	0.029
11/14/1972	16:00:00	0.334	0.028
3/25/1998	17:00:00	0.332	0.027
12/24/1988	23:00:00	0.331	0.027
1/16/1993	10:00:00	0.330	0.027
3/5/1978	7:00:00	0.330	0.026
9/18/1965	16:00:00	0.330	0.026
1/19/1969	9:00:00	0.329	0.026
2/7/1978	19:00:00	0.328	0.026
2/4/1994	11:00:00	0.327	0.026
4/9/1965	22:00:00	0.327	0.025
1/27/1956	0:00:00	0.326	0.025
12/6/1998	6:00:00	0.325	0.025
4/1/1958	17:00:00	0.325	0.025
1/12/1969	7:00:00	0.324	0.025
1/16/1993	13:00:00	0.324	0.025
2/27/1983	14:00:00	0.323	0.024
10/27/2004	6:00:00	0.323	0.024
3/2/1978	8:00:00	0.322	0.024
3/15/1986	23:00:00	0.321	0.024

509	12/30/1951	8:00:00	0.438	0.067
510	2/27/1983	13:00:00	0.437	0.066
511	11/24/1984	17:00:00	0.437	0.066
512	1/5/1992	14:00:00	0.436	0.066
513	1/3/2005	10:00:00	0.435	0.066
514	2/7/1976	23:00:00	0.433	0.065
515	3/16/1958	6:00:00	0.431	0.064
516	1/9/1980	5:00:00	0.430	0.064
517	1/16/1952	16:00:00	0.428	0.063
518	4/8/1965	17:00:00	0.427	0.062
519	11/22/1965	17:00:00	0.422	0.060
520	11/11/1978	15:00:00	0.421	0.060
521	8/17/1977	4:00:00	0.421	0.060
522	2/12/1992	19:00:00	0.420	0.059
523	3/22/1958	3:00:00	0.419	0.059
524	3/20/1991	7:00:00	0.417	0.058
525	3/17/1982	12:00:00	0.416	0.058
526	3/22/1954	12:00:00	0.415	0.058
527	12/31/2004	16:00:00	0.415	0.057
528	8/17/1977	7:00:00	0.410	0.056
529	2/26/2004	7:00:00	0.409	0.055
530	5/3/2003	17:00:00	0.407	0.054
531	1/6/1993	17:00:00	0.406	0.054
532	12/20/2002	17:00:00	0.402	0.052
533	3/1/1991	8:00:00	0.402	0.052
534	10/27/2004	7:00:00	0.402	0.052
535	3/10/1973	15:00:00	0.401	0.052
536	10/20/1979	12:00:00	0.393	0.049
537	1/26/1956	22:00:00	0.387	0.047
538	3/14/1982	15:00:00	0.386	0.046
539	2/17/1994	13:00:00	0.383	0.045
540	2/10/1963	20:00:00	0.381	0.044
541	2/4/1994	11:00:00	0.379	0.044
542	12/4/1974	9:00:00	0.376	0.043
543	3/31/1978	3:00:00	0.375	0.042
544	1/6/1979	2:00:00	0.371	0.040
545	1/12/1960	5:00:00	0.370	0.040
546	1/7/2008	0:00:00	0.368	0.039
547	2/14/1998	16:00:00	0.363	0.038
548	2/19/2005	14:00:00	0.356	0.035
549	1/9/2005	19:00:00	0.353	0.034
550	11/7/1969	2:00:00	0.351	0.034
551	4/1/1958	17:00:00	0.350	0.033
552	11/30/1982	14:00:00	0.350	0.033
553	4/19/1995	14:00:00	0.349	0.033
554	1/4/1995	22:00:00	0.349	0.033
555	3/22/2005	23:00:00	0.349	0.033
556	11/30/2007	15:00:00	0.349	0.033
557	4/10/1952	21:00:00	0.346	0.032
558	3/22/2005	22:00:00	0.344	0.031
559	11/22/1965	15:00:00	0.343	0.031
560	2/2/1960	1:00:00	0.341	0.030
561	10/27/2004	6:00:00	0.341	0.030
562	1/16/1993	8:00:00	0.338	0.029
563	11/15/1952	13:00:00	0.338	0.029
564	2/18/1994	20:00:00	0.335	0.028
565	1/13/1993	22:00:00	0.335	0.028
566	12/30/1951	4:00:00	0.334	0.028
567	1/16/1993	10:00:00	0.333	0.027
568	1/27/1956	0:00:00	0.332	0.027
569	11/3/1957	1:00:00	0.331	0.027
570	3/1/1953	23:00:00	0.330	0.027
571	2/3/2008	11:00:00	0.330	0.026
572	1/16/1993	13:00:00	0.329	0.026
573	12/29/2004	3:00:00	0.325	0.025

1/12/1960	5:00:00	0.321	0.024
3/22/2005	23:00:00	0.320	0.023
1/31/1996	18:00:00	0.320	0.023
3/8/1968	11:00:00	0.319	0.023
12/30/1951	0:00:00	0.319	0.023
1/13/1993	22:00:00	0.318	0.023
2/8/1966	0:00:00	0.318	0.023
3/22/1954	15:00:00	0.317	0.022
1/5/1992	14:00:00	0.317	0.022
1/25/1995	18:00:00	0.317	0.022
1/28/1980	23:00:00	0.316	0.022
4/4/2006	23:00:00	0.315	0.022
3/1/1953	22:00:00	0.315	0.022
1/7/1957	17:00:00	0.315	0.022
1/7/1974	15:00:00	0.313	0.021
4/8/1965	18:00:00	0.313	0.021
1/11/2005	6:00:00	0.312	0.021
2/24/1998	17:00:00	0.312	0.021
11/14/1972	15:00:00	0.310	0.020
11/22/1996	4:00:00	0.308	0.020
11/22/1965	19:00:00	0.308	0.020
3/17/1982	12:00:00	0.308	0.020
1/31/1996	17:00:00	0.307	0.019
1/29/1983	4:00:00	0.306	0.019
1/28/1980	22:00:00	0.306	0.019
2/4/1994	10:00:00	0.306	0.019
4/11/1967	10:00:00	0.305	0.019
12/9/1996	19:00:00	0.305	0.019
4/9/1965	21:00:00	0.303	0.018
12/29/2004	4:00:00	0.302	0.018
1/7/1993	8:00:00	0.302	0.018
11/22/1965	20:00:00	0.301	0.018
2/8/1976	0:00:00	0.299	0.017
1/29/1980	1:00:00	0.299	0.017
11/29/1985	16:00:00	0.297	0.017
2/1/1996	0:00:00	0.297	0.016
1/23/1969	8:00:00	0.296	0.016
12/30/1951	4:00:00	0.295	0.016
12/31/2004	16:00:00	0.295	0.016
1/7/1957	14:00:00	0.294	0.016
1/2/1982	9:00:00	0.293	0.015
2/1/1996	2:00:00	0.293	0.015
3/15/1952	23:00:00	0.293	0.015
1/20/1962	20:00:00	0.292	0.015
1/6/1993	8:00:00	0.292	0.015
3/16/1952	2:00:00	0.291	0.015
10/27/2004	8:00:00	0.291	0.015
2/5/1976	13:00:00	0.290	0.015
2/14/1980	9:00:00	0.290	0.015
2/24/1969	0:00:00	0.290	0.014
1/5/2008	11:00:00	0.287	0.014
3/19/1991	3:00:00	0.286	0.013
3/8/1986	19:00:00	0.285	0.013
2/19/2007	16:00:00	0.285	0.013
1/3/2005	8:00:00	0.285	0.013
3/22/1958	6:00:00	0.284	0.013
3/17/1982	17:00:00	0.284	0.013
12/27/1964	15:00:00	0.284	0.013
2/14/1998	18:00:00	0.284	0.013
1/12/1969	9:00:00	0.283	0.013
12/27/1971	16:00:00	0.283	0.013
3/10/1973	15:00:00	0.282	0.012
1/11/1980	5:00:00	0.282	0.012
12/29/1991	17:00:00	0.282	0.012
3/8/1975	9:00:00	0.282	0.012

574	3/19/1991	4:00:00	0.323	0.024
575	1/7/1957	17:00:00	0.320	0.023
576	3/15/1984	6:00:00	0.317	0.022
577	3/22/1954	15:00:00	0.317	0.022
578	11/29/1985	16:00:00	0.316	0.022
579	2/24/1998	17:00:00	0.315	0.022
580	3/22/1954	18:00:00	0.310	0.020
581	2/8/1993	1:00:00	0.310	0.020
582	11/29/1985	11:00:00	0.308	0.020
583	12/9/1996	20:00:00	0.307	0.019
584	12/29/1991	17:00:00	0.306	0.019
585	2/1/1996	0:00:00	0.305	0.019
586	3/13/1986	19:00:00	0.305	0.019
587	2/2/1960	0:00:00	0.304	0.019
588	10/20/2004	16:00:00	0.303	0.018
589	3/28/2006	23:00:00	0.299	0.017
590	4/2/1974	5:00:00	0.299	0.017
591	2/18/1994	21:00:00	0.299	0.017
592	11/23/1965	0:00:00	0.298	0.017
593	2/4/1958	4:00:00	0.295	0.016
594	3/21/1958	19:00:00	0.294	0.016
595	3/11/1995	4:00:00	0.291	0.015
596	12/30/1951	1:00:00	0.290	0.015
597	12/30/1951	9:00:00	0.287	0.014
598	10/19/2004	16:00:00	0.286	0.013
599	3/8/1986	19:00:00	0.285	0.013
600	2/1/1996	2:00:00	0.285	0.013
601	2/19/1980	3:00:00	0.284	0.013
602	1/7/1995	23:00:00	0.282	0.012
603	3/22/1958	6:00:00	0.282	0.012
604	1/9/2005	10:00:00	0.281	0.012
605	3/15/1952	23:00:00	0.279	0.012
606	3/26/1991	3:00:00	0.279	0.012
607	1/25/1995	18:00:00	0.278	0.011
608	1/6/2008	7:00:00	0.277	0.011
609	11/23/1973	1:00:00	0.273	0.010
610	12/21/1968	7:00:00	0.272	0.010
611	2/12/1962	0:00:00	0.272	0.010
612	3/16/1952	2:00:00	0.271	0.010
613	1/23/1967	1:00:00	0.266	0.009
614	10/27/2004	8:00:00	0.266	0.009
615	3/22/1954	13:00:00	0.266	0.008
616	11/22/1973	23:00:00	0.265	0.008
617	10/19/2004	15:00:00	0.265	0.008
618	2/9/1985	12:00:00	0.263	0.008
619	3/1/1976	14:00:00	0.260	0.007
620	4/11/1967	10:00:00	0.259	0.007
621	1/25/1954	10:00:00	0.257	0.006
622	3/2/2004	4:00:00	0.255	0.006
623	1/11/2001	7:00:00	0.253	0.006
624	3/13/1986	18:00:00	0.252	0.006
625	1/7/1974	15:00:00	0.250	0.005
626	12/2/1955	0:00:00	0.247	0.004
627	1/27/1956	5:00:00	0.246	0.004
628	11/22/1965	20:00:00	0.245	0.004
629	12/30/1951	20:00:00	0.244	0.004
630	2/27/1983	14:00:00	0.243	0.004
631	5/8/1977	17:00:00	0.242	0.004
632	12/6/1966	11:00:00	0.240	0.003
633	3/19/1991	3:00:00	0.240	0.003
634	4/8/1975	15:00:00	0.239	0.003
635	3/19/1979	5:00:00	0.238	0.003
636	2/4/1994	10:00:00	0.237	0.003
637	3/1/1991	5:00:00	0.231	0.002
638	11/22/1996	4:00:00	0.230	0.002

11/9/2002	16:00:00	0.281	0.012
12/20/2002	17:00:00	0.281	0.012
1/14/1978	23:00:00	0.280	0.012
2/10/1982	19:00:00	0.280	0.012
2/11/1959	23:00:00	0.278	0.011
1/13/1957	5:00:00	0.278	0.011
4/2/1974	5:00:00	0.277	0.011
3/19/1981	21:00:00	0.276	0.011
3/11/1995	6:00:00	0.275	0.011
4/10/1952	21:00:00	0.275	0.011
2/10/1982	23:00:00	0.275	0.011
2/12/1962	0:00:00	0.274	0.010
1/24/1969	19:00:00	0.273	0.010
3/14/1982	17:00:00	0.272	0.010
1/6/2008	23:00:00	0.272	0.010
3/16/1952	5:00:00	0.271	0.010
3/13/1986	18:00:00	0.271	0.010
3/22/1954	13:00:00	0.271	0.010
11/17/1964	19:00:00	0.270	0.010
1/21/1964	12:00:00	0.270	0.009
1/6/1979	3:00:00	0.268	0.009
1/27/1983	10:00:00	0.267	0.009
3/7/1952	16:00:00	0.266	0.009
3/1/1952	8:00:00	0.265	0.008
2/19/1993	16:00:00	0.264	0.008
12/18/1967	23:00:00	0.264	0.008
2/3/2008	11:00:00	0.264	0.008
2/4/1989	17:00:00	0.261	0.007
2/21/1980	2:00:00	0.261	0.007
1/3/2005	9:00:00	0.261	0.007
12/5/1951	4:00:00	0.260	0.007
2/7/1976	23:00:00	0.259	0.007
3/18/1982	3:00:00	0.258	0.007
12/9/1996	18:00:00	0.258	0.007
11/3/1957	1:00:00	0.258	0.007
2/10/1963	16:00:00	0.257	0.007
1/20/1962	17:00:00	0.257	0.007
4/8/1965	17:00:00	0.256	0.006
3/1/1953	23:00:00	0.256	0.006
1/7/1995	23:00:00	0.255	0.006
12/21/1970	7:00:00	0.255	0.006
2/23/2005	4:00:00	0.255	0.006
1/27/1983	20:00:00	0.254	0.006
3/7/1952	19:00:00	0.253	0.006
12/30/1951	20:00:00	0.252	0.006
2/10/1982	13:00:00	0.251	0.005
11/29/1985	10:00:00	0.251	0.005
2/20/1994	15:00:00	0.250	0.005
3/1/1991	2:00:00	0.250	0.005
2/2/1960	2:00:00	0.249	0.005
2/19/1993	15:00:00	0.249	0.005
1/15/1993	16:00:00	0.248	0.005
2/12/2005	1:00:00	0.246	0.004
1/7/1957	13:00:00	0.245	0.004
10/20/2004	16:00:00	0.245	0.004
1/7/2008	1:00:00	0.243	0.004
1/23/1969	15:00:00	0.243	0.004
3/7/1952	18:00:00	0.243	0.004
3/13/1986	19:00:00	0.243	0.004
1/25/1954	10:00:00	0.242	0.004
11/13/1978	22:00:00	0.242	0.004
5/8/1977	17:00:00	0.242	0.004
1/8/1993	0:00:00	0.241	0.004
2/10/1963	19:00:00	0.240	0.003
1/7/1995	19:00:00	0.240	0.003

639	3/1/1991	9:00:00	0.230	0.002
640	3/25/1977	3:00:00	0.229	0.002
641	1/7/1993	0:00:00	0.229	0.002
642	3/21/1958	18:00:00	0.228	0.001
643	2/14/1980	9:00:00	0.228	0.001
644	1/29/1983	3:00:00	0.227	0.001
645	3/1/1991	2:00:00	0.226	0.001
646	1/22/1969	18:00:00	0.226	0.001
647	3/5/1978	7:00:00	0.225	0.001
648	2/11/1959	23:00:00	0.224	0.001
649	2/13/1954	20:00:00	0.224	0.001
650	11/22/1965	19:00:00	0.222	0.001
651	1/10/1978	20:00:00	0.221	0.001
652	3/16/1952	5:00:00	0.220	0.001
653	1/5/2008	11:00:00	0.220	0.001
654	3/1/1978	17:00:00	0.219	0.001
655	3/13/1973	14:00:00	0.218	0.000
656	3/1/1991	7:00:00	0.218	0.000
657	3/22/1958	4:00:00	0.217	0.000
658	1/23/1969	8:00:00	0.217	0.000
659	3/1/1991	6:00:00	0.217	0.000
660	3/13/1967	22:00:00	0.216	0.000
661	4/3/1965	9:00:00	0.215	0.000
662	2/4/1989	17:00:00	0.215	0.000
663	3/2/1978	17:00:00	0.215	0.000
664	4/4/2006	23:00:00	0.214	0.000
665	1/7/1993	8:00:00	0.213	0.000
666	2/13/1973	2:00:00	0.213	0.000
667	3/8/1974	8:00:00	0.213	0.000
668	1/20/1962	17:00:00	0.211	0.000
669	12/21/1970	7:00:00	0.211	0.000
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1/5/1979	23:00:00	0.239	0.003
1/26/1997	2:00:00	0.239	0.003
2/14/1995	9:00:00	0.238	0.003
11/23/1973	1:00:00	0.238	0.003
12/2/1955	0:00:00	0.237	0.003
2/20/1962	9:00:00	0.237	0.003
12/21/1968	7:00:00	0.236	0.003
2/21/2005	8:00:00	0.236	0.003
11/15/1952	13:00:00	0.236	0.003
2/20/1980	3:00:00	0.234	0.002
2/13/1954	21:00:00	0.233	0.002
2/29/1960	7:00:00	0.233	0.002
5/3/2003	17:00:00	0.232	0.002
2/7/1978	18:00:00	0.230	0.002
3/1/1976	14:00:00	0.230	0.002
12/3/1966	14:00:00	0.230	0.002
1/12/1969	13:00:00	0.228	0.001
12/25/1971	19:00:00	0.228	0.001
2/28/2006	7:00:00	0.227	0.001
2/22/2005	18:00:00	0.225	0.001
3/4/1978	16:00:00	0.225	0.001
3/24/1977	20:00:00	0.225	0.001
2/19/1980	14:00:00	0.224	0.001
3/5/1995	6:00:00	0.224	0.001
2/10/1963	12:00:00	0.223	0.001
1/26/1997	0:00:00	0.223	0.001
11/22/1996	1:00:00	0.223	0.001
1/12/1997	16:00:00	0.223	0.001
1/12/1969	12:00:00	0.223	0.001
3/22/1958	4:00:00	0.222	0.001
1/5/1992	18:00:00	0.222	0.001
3/13/1967	22:00:00	0.221	0.001
12/6/1966	11:00:00	0.220	0.001
2/25/1969	12:00:00	0.220	0.001
4/30/1983	4:00:00	0.220	0.001
1/25/1956	23:00:00	0.218	0.000
2/13/1954	22:00:00	0.218	0.000
4/8/1975	15:00:00	0.218	0.000
1/6/1993	10:00:00	0.217	0.000
1/12/1960	8:00:00	0.217	0.000
12/25/1988	2:00:00	0.216	0.000
3/22/1954	11:00:00	0.215	0.000
2/26/1983	14:00:00	0.215	0.000
11/29/1985	11:00:00	0.214	0.000
4/2/1974	6:00:00	0.214	0.000
3/7/1952	17:00:00	0.213	0.000
1/10/1955	10:00:00	0.213	0.000
3/2/1976	22:00:00	0.213	0.000
2/21/2005	12:00:00	0.213	0.000
11/19/1967	7:00:00	0.212	0.000
2/15/1986	9:00:00	0.212	0.000
3/7/1952	15:00:00	0.212	0.000

APPENDIX 5

S_P Calculations (Including Overall E_P/S_P value)

S_P Calculation (Based on all Pre & Post Dev. Sub-areas defined as CCSYA)

Pre-Development Sp

Areas at each slope Range

Range	fraction	Area at each range	Sediment Yield	TOTAL (green are CCSYA)
0-10%	0.068	0.347 acres	6.5 ton/acre/yr	2.26 ton/yr
10-20%	0.467	2.393 acres	8.3 ton/acre/yr	19.86 ton/yr
20-40%	0.395	2.024 acres	10.6 ton/acre/yr	21.46 ton/yr
> 40%	0.071	0.362 acres	13.5 ton/acre/yr	4.88 ton/yr

ALL: 5.126 acres — **26.34 ton/yr**

Critical: 2.386 acres → (from entire project area)

Post-Development Sp

Remaining Natural Areas at each slope Range

Range	fraction	Area at each range	Sediment Yield	TOTAL (green are CCSYA)
0-10%	0.048	0.026 acres	6.5 ton/acre/yr	0.17 ton/yr
10-20%	0.285	0.155 acres	8.3 ton/acre/yr	1.29 ton/yr
20-40%	0.530	0.288 acres	10.6 ton/acre/yr	3.06 ton/yr
> 40%	0.137	0.075 acres	13.5 ton/acre/yr	1.01 ton/yr

All: 0.544 acres — 4.06 ton/yr

Critical: 0.363 acres → (from 10, 11, 12a, 12b, 13 & 14)

Additional Sediment Production by By-Passed Slope Areas

Description	Area of each portion	Sediment Yield[(1)]	TOTAL
Sub-areas 8, 9 and 9a (cut)	0.276 acres	9.40 ton/acre/yr (with P = 0.5)	2.59 ton/yr
Sub-area 2 and 7 (cut)	0.379 acres	9.40 ton/acre/yr (with P = 0.5)	3.57 ton/yr
Sub-area 1 (fill)	0.477 acres	3.77 ton/acre/yr (with P = 0.25)	1.80 ton/yr
Sub-areas 3, 5a, 5b & 6 (fill)	0.769 acres	3.77 ton/acre/yr (with P = 0.25)	2.90 ton/yr
Sub-areas 3b, 4 & 5c (fill)	0.232 acres	3.77 ton/acre/yr (with P = 0.25)	0.88 ton/yr

(1) : Sediment Yield based upon modification of K, LS, C, R and P parameters from Table A.4.2, as explained below.

all slopes: 2.134 acres — 11.73 ton/yr

RUSLE Total (slopes and natural) **15.80 ton/yr**

SY_{RUSLE} : 0.600 (proportional to preserved load or (15.80/26.34))

$SY_{channel}$: $CCSYA_{pre}/CCSYA_{post}$: N/A

S_P : 0.600 ($1 \cdot SY_{RUSLE} + 0 \cdot SY_{NHD}$)

E_P (from E_P calcs) : 0.586

E_P / S_P : **0.98** (it must be less or equal than 1.1)

Modification of K, LS, C, R and P Parameters for Cut and Slope areas

CUT: K, LS, C, R, P are 0.24, 9.82, 0.14, 57, 0.5 respectively. **A = K·LS·C·R·P =**	**9.40**
FILL: K, LS, C, R, P are 0.24, 7.87, 0.14, 57, 0.25 respectively. **A = K·LS·C·R·P =**	**3.77**

K : Assumed as 0.20, 0.21, 0.22 and 0.23 for agricultural/grass with slopes of (0%-10%), (10%-20%), (20%-40%) and > 40% respectively in Table A.4.2. Extrapolated to K = 0.24 for cut slopes (67%) and K = 0.24 for fill slopes (50%).

LS : Assumed as 4.67, 5.19, 6.04 and 7.38 for agricultural/grass with interval average slope of 5%, 15%, 30% and about 45% respectively in Table A.4.2. Extrapolated to LS = 9.82 for cut slopes (67%) and 7.87 for fill slopes (50%).

C : C is independent of slope and assumed 0.14 for the landscape unit. Same value assumed for cut and fill slopes

R : It's 50 for 0%-10% slopes, and changes little afterwards (56 for 10% - 20% and 57 for 20-40% and > 40%). No change

P: Assumed P=1 for natural soils, P=0.50 for Cut slopes and P=0.25 for fill slopes (recommended safety factors in Appendix H)

APPENDIX 6

Response to Comments

ATTACHMENT A
PROJECT ISSUE CHECKLIST

PROJECT NAME:	**ResQue Ranch**	**Project Number:**	**PDS2015-LDGRMJ-30067**
Specialist Name:	**Charles Mohrlock**	**Project Manager Name:**	**Sean McLean**

PDS (Planning & Development Services) Planning and CEQA Comments

Item No.	Subject Area	Issue, Revision or Information Required	Issue Resolution Summary (Include Conditions)	Date Identified	Date Resolved
1	Critical Coarse Sediment Study	REQUIREMENT - [VERIFICATION OF GLUs, APPENDICES 1 & 2]: Provide a GLU map depicting all onsite and upstream critical coarse sediment GLUs in the **pre-project condition**. These maps must represent all applicable GLU types taken from Table A.4.2 of the WMAA document.	A new pre-project map has been included.		
2	Critical Coarse Sediment Study	REQUIREMENT - [VERIFICATION OF GLUs, APPENDICES 1 & 2]: Provide a GLU map depicting all onsite and upstream critical coarse sediment GLUs in the **post-project condition**. These maps must represent all applicable GLU types taken from Table A.4.2 of the WMAA document. If soil loss credit for cut/fill slopes is utilized for Post-Project condition, include appropriate additional GLU types.	A new post-project map has been included.		
3	Critical Coarse Sediment Study	REQUIREMENT - [SP TEXT/CALCS, PAGE 4 & APPENDIX 5]: Page H-64 of the County BMPDM indicates that projects without onsite NHDPlus channels shall omit consideration of channel sediment yield. Since this project does not have NHD streams, all text and calculations associated with NHD soil loss must be removed.	New calculations no longer include NHD streams and other small streams, and 100% of S_P is based upon soil loss equation. Refer to new report.		
4	Critical Coarse Sediment Study	REQUIREMENT - [POST DEVELOPMENT CCSYA EXHIBIT, APPENDIX 3]: Provide a single exhibit depicting all onsite and upstream CCSYAs that are effectively avoided AND allowed to pass through/around the project site in order to meet the no net impact standard.	A new exhibit has been included. All off-site areas do not drain to the project area as the project is surrounded by brow ditches with enough slope to convey flows and CCSY.		
5	Critical Coarse Sediment Study	REQUIREMENT - [AVOID AND BYPASS TEXT/CALCS/EXHIBITS]: Provide information/calculations/exhibits demonstrating how flows from preserved CCSYAs are routed through/around the project site at a minimum cleansing velocity. This can be performed by satisfying standard design criteria referenced in Appendix H.3.1 of the BMPDM or by demonstrating flows from coarse areas are routed through conveyances maintaining a peak 2 year storm velocity of 3 feet per second or more.	See new section in the updated report before the conclusion, where it is demonstrated that the slopes proposed for the brow-ditches are sufficient to guarantee a velocity larger than 3 ft/sec for the 2 year peak flow.		

ATTACHMENT A
PROJECT ISSUE CHECKLIST

PROJECT NAME:	**ResQue Ranch**	**Project Number:**	**PDS2015-LDGRMJ-30067**
Specialist Name:	**Charles Mohrlock**	**Project Manager Name:**	**Sean McLean**

PDS (Planning & Development Services) Planning and CEQA Comments

Item No.	Subject Area	Issue, Revision or Information Required	Issue Resolution Summary (Include Conditions)	Date Identified	Date Resolved
6	Critical Coarse Sediment Study	SUGGESTION - [EP CALCULATION, APPENDIX 4]: Value for 0.1Q2 represented in these calculations (0.1989 cfs) does not match what is presented in the continuous simulation modeling results (0.207 cfs), but this does not affect the results in this case. It would be helpful if a note was added to the Ep tables indicating that Ep calculations have been performed using the Simplified Ep Method presented in Equation H.8.1 of the County BMPDM. It is noted that the applicant has elected to perform additional analysis of flows outside the range of 0.1Q2 to Q10. This is acceptable but not required.	There was a minor error because the CCSYA report was not updated. In new version of the report 10% of Q2 in the HMP Model = 10% Q2 in the CCSYA report. A note explaining that the simplified method has been added in the calculations will be included.		
7	Critical Coarse Sediment Study	SUGGESTION - [PDP SWQMP, Step 3.7.1]: Remove checkmark indicating project identified and is in compliance through "Scenario 1" requirements as it does not utilize the RPO Method. Instead add a checkmark indicating that a No Net Impact analysis has been performed.	Checkmark will be updated as it corresponds, according to this suggestion.		
8	Critical Coarse Sediment Study	SUGGESTION - [INTRODUCTION, PAGE 1] The No Net Impact equation at the end of the paragraph is incorrectly represented, it should be Ep/Sp≤1.1. This is simply a typo and is not carried through the rest of the report.	Typo has been corrected.		
9	Critical Coarse Sediment Study	SUGGESTION - [INTRODUCTION, PAGE 1]: Include reference to that No Net Impact Analysis has been performed per guidelines set forth in Appendix H of the February 2016 County BMPDM.	Reference has been included in Introduction.		

Review of CCSYA Comments made by Rick Engineering (Third Party Reviewer)

REC has provided responses to the comments prepared by the County expert in this CCSY issue, Charles Mohrlock, which are included in this attachment. It is customary that only comments provided by him (or another expert assigned by the County in regards to CCSY) are responded by REC in detail, to avoid (a) responding to comments already addressed by him and (b) responding to comments from which an agreement has already been reached or comments that the County does not consider significant. However, a brief response to Rick Engineering's comments is included for the sake of completeness.

Second Review Submittal, New Comment: Demonstration of No Net Impact: Runoff from Area 2 is directed into Basin B where sediment will settle out. Either revise the Sp calculations to exclude Area 2 or demonstrate that runoff from Area 2 will be bypassed through the project.

Response: For the purpose of CCSY calculation, Area 2 is only the slope area, and it will be by-passed as it drains to a brow-ditch that does not drain into LID-1. Therefore, comment does not apply.

Second Review Submittal, New Comment: Equation H.8.11, with both the SYRUSLE and SYNHD included, is used to calculate the Sediment Supply Potential (Sp) parameter. In accordance with the BMP DM (Section H.8.2), projects that do not have onsite NHDPlus channels shall omit consideration of SYNHD and weighting factors depicted in Equation H.8.11. This simply results in Sp = SYRUSLE. Revise the calculation of Sp accordingly.

Response: Same comment made by County. Calculations have been reviewed.

Second Review Submittal, New Comment: Page 2 of the CCSYA memo states that the work equation will be applied to "ALL peak flows larger than the pre-development 0.1Q2 flow". The Ep analysis should only consider the geomorphically significant range between 0.1Q2 and Q10. This review acknowledges the difference is small, however the next submittal should only consider the range between 0.1Q2 and Q10.

Response: County expert already agreed with author that the inclusion of all peak flows is a valid option which is not mandatory but it is acceptable. There is no need to change calculations.

Second Review Submittal, New Comment: Please utilize Worksheet H.8.2-1 for the Sp calculation.

Response: County expert already agreed that the calculations as presented are valid. No need to change calculations for this reason.

Second Review Submittal, New Comment: To receive credit for bed sediment yield from engineered slopes, four conditions listed on page H-63 of the BMP DM must be met. The selected cover factor and practice factor met the criteria. Please provide the grain size analysis and the geotechnical engineer's statement.

Response: County expert already agreed with the expert opinion of the author of this study in terms of the sediment production assigned for slopes, as (a) geotechnical engineers are not experts on sediment transport; and (b) the grain size analysis will not provide any additional insight in terms of the sediment production according to USLE equation, and cannot be performed a priori, before slopes are fully constructed. In addition, P factor has an embedded safety factor penalizing the sediment production of cut and fill slopes so there is no need to further complicate calculations by requesting a statement and a grain size analysis that will not change the results. No need to change calculations per this comment.

Second Review Submittal, New Comment: Please provide calculations to demonstrate that coarse sediment from bypass areas will be effectively bypassed to the POC pursuant to Appendix H.3.

Response: Same comment that the County Expert. Slope table that links contributing area, geometry of the brow-ditch and slope required has been provided in the new report before the conclusions.

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☒ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

RECORDING REQUESTED BY:

WHEN RECORDED MAIL TO:

(property owner)

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAINTENANCE NOTIFICATION AGREEMENT FOR CATEGORY 1 STORMWATER STRUCTURAL BMP's

THIS AGREEMENT is made on the _____ day of _____, 20 18 .
Phil Pace ~ 4030 Goldfinch Investments, LLC., the Owner(s) of the hereinafter described real property:
Address 15635 Paseo Penasco Post Office Escondido Zip Code 92025
Assessor Parcel No.(s) 276-030-48 & 49

List, identify, locate (plan/drawing number) and describe the Structural

PDS2016-LDGRMJ-30067 - RESQUE RANCH HIGHLAND VALLEY ROAD "VIOLATION"

BIOFILTRATION & BIORETENTION BASINS

Owner(s) of the above property acknowledge the existence of the storm water Structural Best Management Practice on the said property. Perpetual maintenance of the Structural BMP(s) is the requirement of the State NPDES Permit, Order No. R9-2015-0001, Section E.3.e.(1)(c) and the County of San Diego Watershed Protection Ordinance (WPO) Ordinance No. 10385 Section 67.812 through Section 67.814, and County BMP Design Manual (BMP DM) Chapters 7 & 8. In consideration of the requirement to construct and maintain Structural BMP(s), as conditioned by Discretionary Permit, Grading Permit, and/or Building Permit (as may be applicable), I/we hereby covenant and agree that:

1. I/We are the owner(s) of the existing (or to be constructed concurrently) premises located on the above described property.
2. I/We shall take the responsibility for the perpetual maintenance of the Structural BMP(s) as listed above in accordance with the maintenance plan and in compliance with County's self-inspection reporting and verification for as long as I/we have ownership of said property(ies).
3. I/We shall cooperate with and allow the County staff to come onto said property(ies) and perform inspection duties as prescribed by local and state regulators.
4. I/We shall inform future buyer(s) or successors of said property(ies) of the existence and perpetual maintenance requirement responsibilities for Structural BMP(s) as listed above and to ensure that such responsibility shall transfer to the future owner(s).
5. I/We will abide by all of the requirements and standards of Section 67.812 through Section 67.814 of the WPO (or renumbering thereof) as it exists on the date of this Agreement, and which hereby is incorporated herein by reference.

This Agreement shall run with the land. If the subject property is conveyed to any other person, firm, or corporation, the instrument that conveys title or any interest in or to said property, or any portion thereof, shall contain a provision transferring maintenance responsibility for Structural BMP(s) to the successive owner according to the terms of this Agreement. Any violation of this Agreement is grounds for the County to impose penalties upon the property owner as prescribed in County Code of Regulatory Ordinances, Title 1, Division 8, Chapter 1 Administrative Citations §§18.101-18.116.

_____ _____
Owner(s) Signature(s)

Phil Pace _____
Print Owner(s) Name(s) and Title

STATE OF CALIFORNIA)
COUNTY OF _____)

On _____ before me, _____Notary Public,
personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

OPERATION & MAINTENANCE (O&M) PLAN

1. Contents

ATTACHMENTS

1. PROJECT DESCRIPTION

The project will disturb most of the site and consists developing a horse stable, with a driveway and hardscape surfaces. Construction will include associated utilities, landscaping and an onsite bioretention facility for stormwater treatment.

2. OPERATION & MAINTENANCE (O&M) PLAN

This document has been prepared in compliance with the San Diego Regional Water Quality Control Board requirements and in accordance with requirements set by the County. A Storm Water Quality Management Plan (SWQMP) has been prepared for the project. It identifies the specific Best Management Practices (BMPs) required for the project. Refer to this project's SWQMP for additional information on BMPs. Proper maintenance of the project BMP's is required for their intended and effective function. This O&M Plan provides operation and maintenance procedures for the BMPs designated in the SWQMP. It includes procedures to be followed for inspection and maintenance of the BMPs, instructions for documenting the work performed, record keeping, and outlining the requirement and procedures for training of personnel involved in the process.

3. Operation & Maintenance of BMP'S

It shall be the responsibility of the "Owner or Designated Responsible Party" to maintain and to train all employees for the maintenance and operation of all BMPs, to achieve the maximum pollutant reduction they are designed for, as addressed in the approved Project's SWQMP. The following schedule of O&M's must be followed to satisfy the Conditions of Approval and the Pollutants of Concern as addressed in the approved Project's SWQMP. This schedule shall include periodic inspections of all Source Control and Treatment Control BMP's. All maintenance records for training, inspection and maintenance shall be retained and provided to the county upon request.

All BMPs shall be inspected prior to August 31st each year and certified to the County Engineering Department as to their readiness to receive runoff from the annual rainfall season (See enclosed attachment for a more detailed schedule of maintenance)

Access for maintenance of the structural BMPs shall be through the parking lot

The owner will also, provide the County as part of the maintenance and operation agreement an executed access easement that shall be binding on the land throughout the life of the project.

Owner/Responsible Party for O&M Maintenance and For Training

4030 Goldfinch Investment, LLC
c/o Phil Pace
15635 Paseo Penasco, Escondido CA 92025
(619) 814-0050
phil@Philsbbq.net

The Designated Responsible Party will be responsible for ensuring that individuals involved in O&M activities, including but not limited to contractors and new owners, will be trained according to the training program herein, Additionally, upon any future sale of the property, the Owner will be responsible for ensuring that the new Designated Responsible Party is familiar with the contents of the plan and the requirements for the routine inspection, routine and non-routine maintenance and record keeping tasks as described herein. All parties involved in the O&M activities will be required to read this plan.

A. Training

Personnel training is an important component of the Implementation of this O&M Plan. The employee training program may consist of a meeting with any new owners, Designated Responsible Party or contractor/employees Involved in the O&M activities to review the contents of this plan and to physically tour the facility to observe the BMPs and describe O&M requirements for each BMP. The Designated Responsible Party will implement the training program. All new contractors involved in landscape and/or facility maintenance at the site shall receive training within 30-days of hire and shall receive updated annual training. Maintenance contractor shall verify staff training annually.

The Designated Responsible Party shall be responsible for documenting all training activities and for maintaining records related to training. Forms for documentation of training are included in Attachment C1 of this plan. Training records must be shall be retained and provided to the county upon request.

B. Landscaping

Operational and maintenance needs include:

- Vegetation management to maintain adequate infiltration and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.
- Trash, debris, tree pruning, and leaf collection and removal to prevent obstruction of a landscape areas so as not to prohibit their use as a BMP.
- Monitoring the irrigation equipment.
- Removal of standing water, which may contribute to the development of aquatic plant communities or mosquito breeding areas.
- Erosion and structural maintenance to prevent the loss of soil and maintain the performance of all landscaping.
- Maintain a mulch layer over all exposed soil.

<u>Inspection Frequency</u>

All facilities will be inspected and inspection visits will be completely documented:

- Once a month at a minimum.

- After every large storm (after every storm monitored or these storms with more than 0.50 inch of precipitation.)
- On a weekly basis during extended periods of wet weather.

Inspect for proper irrigation and fertilizer use, and ensure that all landscaped areas have minimum of 80% coverage.

Visual Inspection as part of landscape maintenance

- Inspect before and after the rainy season (Oct. 1 to April 30).

Aesthetic Maintenance

The following activities will be included in the aesthetic maintenance program:

Weed Control. Weeds will be removed through mechanical means. Herbicide shall not be used because these chemicals will impact the water quality monitoring.

Functional Maintenance

Functional maintenance has two components:

- Preventive maintenance
- Corrective maintenance

Preventive Maintenance

Preventive maintenance activities to be instituted for landscaped areas are:

- Vegetation seed, mix within the landscaped areas, are to be designed to be kept short to maintain adequate drainage and to limit the development of faunal habitats.
- Prohibitive dumping placards.
- Trash and Debris: During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.
- Sediment Removal: Sediment accumulation, as part of the operation and maintenance program at of landscaped areas, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment reaches a level at or near plant height, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the landscaped areas to design performance standards. Actions will include using additional fill and vegetation and/or removing accumulated sediment to correct channeling or ponding. Characterization and Appropriate disposal of sediment will comply with applicable local, county, state, or federal requirements. The landscaped areas will be re-graded, if the flow gradient has changed, and then replanted with in kind plant material.
- Removal of Standing Water: Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas. Standing water may remain a maximum of 72 hours.

- Fertilization and Irrigation: The vegetation seed mix is to been designed so that fertilization and irrigation is to be kept at a minimum.
- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats. All mosquitoes require a water source to lay their eggs, which in the hottest part of summer can hatch into larvae within a week..

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of all landscaped areas.

Corrective maintenance activities include:

- Removal of Debris and Sediment: Sediment, debris, and trash, which impede the hydraulic functioning of landscaping and prevent vegetative growth, will be removed and properly disposed. Temporary arrangements will be made for handling the sediments until a permanent arrangement is made. Vegetation will be re-established after sediment removal.
- Structural Repairs: Once deemed necessary, repairs to structural components of landscaping will be done within 10 working days. Qualified individuals (i.e., the designers or contractors) will conduct repairs where structural damage has occurred.
- Embankment and Slope Repairs: Once deemed necessary, damage to the embankments and slopes of landscaped areas will be repaired as soon as possible, and within 10 working days maximum.
- Erosion Repair: Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance and use of landscaped areas as BMPs. There are a number of corrective actions than can be taken.
- These include erosion control blankets, riprap, sodding, or reduced flow through the area. Designers or contractors will be consulted to address erosion problems if the solution is not evident.
- Elimination of Animal Burrows: Animal burrows will be filled and steps taken to remove the animals if burrowing problems continue to occur (filling and compacting). If the problem persists, vector control specialists will be consulted regarding removal steps. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated.
- General Facility Maintenance: In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

Maintenance Frequency

The Inspection & Maintenance Schedule included in enclosed Attachment A1 for all BMPs lists the schedule of maintenance activities to be implemented.

Debris and Sediment Disposal

Waste generated onsite is ultimately the responsibility of the Owner. Disposal of sediments, debris, and trash will comply with applicable local, county, state, and federal waste control programs.

Hazardous Waste
Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria listed in the CCR, Title 22, Article 11.

C. Irrigation System

Inspection Frequency and Procedure

The Irrigation system shall be checked each week as a minimum. The following items shall be checked to insure that they are functioning properly:
The Irrigation system shall be checked each week as a minimum. The following items shall be checked to insure that they are functioning properly:

- Shut-off devices
- Pressure drop sensors
- Moisture sensors
- All piping and sprinkler heads to insure there are no leaks and that proper water spread is maintained.
- All flow reducers.
- Irrigation controls, make scheduling & timing adjustment to accommodate the weather.
- Check for overspray/runoff

D. Roof Drains

All roof drains shall be inspected prior to August 31st of each year to ensure that they are clean and free from trash and in good repair. They shall be flushed and any leaks or damages piping shall be either replaced or repaired. Where roof drains flow onto landscaped areas splash structures and or rock rip-rap shall be maintained so the flow from the roof drains do not cause erosion or damage to the landscaped area.

- It is not permissible to directly connect roof drains into a drain system.
- Roof drain downspouts shall discharge runoff to a landscaped area, and to allow the runoff to flow through landscape, prior to entering a private yard drain system.

E. Trash Storage Areas

- All trash storage areas shall be inspected daily to insure that they are clean from trash. Also the following shall be inspected annually before and after the rainy season (Oct. 1 to April 30).
    - Pavement is in good repair.
    - Drainage will not run-off onto adjacent areas.
    - That they remain screened or walled to prevent off-site transport of trash.
    - That all lids are closed and/or awnings are in good repair to minimize direct precipitation.

F. Storm Water Conveyance System Stenciling and Signing

- Signage/stenciling are to be inspected for legibility and visual obstruction and shall be Repaired and cleared of any obstruction within 5 working day of inspection.
- Inspection Frequency: Semi-annually, and monthly during rainy season.

G. Structural BMP: Biofiltration & Bioretention

Vegetated Infiltration or Filtration BMP
Maintenance Indicators and Actions for Vegetated BMPs

Typical Maintenance Indicator(s) for Vegetated BMPs	Maintenance Actions
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.
Overgrown vegetation	Mow or trim as appropriate, but not less than the design height of the vegetation per original plans when applicable (e.g. a vegetated swale may require a minimum vegetation height).
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, The County must be contacted prior to any additional repairs or reconstruction..
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, The County must be contacted prior to any additional repairs or reconstruction.
Standing water in vegetated swales	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, County staff in the Watershed Protection Program must be contacted prior to any additional repairs or reconstruction.
Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
Obstructed inlet or outlet structure	Clear obstructions.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.
*These BMPs typically include a surface ponding layer as part of their function which may take 96 hours to drain following a storm event.	

Inspection Frequency

The facility will be inspected and inspection visits will be completely documented:

- Once a month at a minimum.
- After every large storm (after every storm monitored or these storms with more than 0.50 inch of precipitation.)
- On a weekly basis during extended periods of wet weather.

Maintenance is needed if vegetation height is greater than 5" (height shall be kept between 2" and 5"); if there is standing water; if debris are present or if sedimentation is occurring at the vegetation height; ensure that all landscaped areas have minimum of 80% coverage and that no animal burrows are present.

Visual Inspection as part of landscape maintenance

- Inspect before and after the rainy season (Oct. 1 to April 30).

H. Outlet Structures

All outlet structures shall be kept functional at all times. Routine inspection and corrective maintenance shall include removal of trash sediment and debris and repair of any structural damage or clogging of orifice outlets. The minimum maintenance frequency shall be weekly during rainy season or within 24 hours prior to rain forecasts.

I. Vector Control Owner Responsibilities

VECTOR MANAGEMENT CONTROL REQUIREMENTS

Any method to limit or eradicate the mammals, birds, insects or other arthropods which transmit disease pathogens. Management of mosquitoes and other vectors in stormwater management structures, such as Bioretention Facilities and Best Management Practices, is critical for protecting public health.

In order to implement vector controls including minimizing the risk for mosquito-borne disease transmission, It is the responsibility of the Owner to regularly maintain the outlet structures and monitor the site after every storm event to ensure that the system (comprising of above and below ground storage facilities) is dewatered in less than 72 hours. Otherwise the owner will be required to implement a vector control plan in accordance with the county's Department of Public Health.

- Maintain all drainage inlets and outlets trash free; remove silt; make sure to clear any standing water after 72-hours of ponding.

Vector Control Resources:

1. For County of San Diego vector educational brochures please reference the following website: http://www.sdcounty.ca.gov/deh/pests/vector_disease.html

2. Please contact the Department of Environmental Health Vector Control Program Department of Environmental Health Phone number: 858-694-2888

Maintenance Category 1

Structural BMPs that are minor in nature, have minimal maintenance responsibilities, and are typical for residential land uses. The proposed BMPs inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property. The owner will perform ongoing maintenance with County's reduced oversight. A "Maintenance Notification" that records with the property is required for all Category 1 BMPs. At a minimum, the responsible party provides annual documentation to the County verifying that the BMPs are maintained and functioning properly..

Category 1 Mechanisms to Assure Maintenance

1. Watershed Protection Ordinance Requirement: WPO Section 67.812 requires ongoing maintenance of BMPs. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.

2. Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.

3. Notice to Purchasers: Section 67.812(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.

4. Conditions in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.810(a)) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the maintenance plan. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.

5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider must provide evidence to the County , that the subdivider to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to specific subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

6. BMP Maintenance Agreement with Easement and Covenant: WPO Section 67.812(f) requires that an agreement will be entered into with the County, which will function in three ways:
It will commit the land to being used only for purposes of the BMP;

It will include an agreement by the landowner to maintain the BMPs in accordance with the maintenance plan (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and
It will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs. This would be required of all applications listed in WPO Section 67.810 with Category 2 BMPs. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

Funding:

None Required.

ATTACHMENT "A1" (INSPECTION & MAINTENANCE SCHEDULE)

PREVENTATIVE MAINTENANCE AND ROUTINE INSPECTION					
TYPE BMP	Routine Action	Maintenance Indicator	Maintenance Frequency	MAINTENANCE ACTIVITY	SITE-SPECIFIC REQUIREMENTS
Landscaping & irrigation	Proper irrigation & Fertilizer.	Less than 80% coverage	Each year as needed and once during rainy season (Oct. 1 to April 30)	Re-plant. Repair Irrigation system within 5-days.	All slopes and landscaped areas are to have a minimum coverage of 80%
Trash storage areas	Trash free and removal of silt	Visual Inspection	Daily inspection	Remove trash and silt Daily.	All trash storage areas to be free from trash and silt at all times
Roof drain	Trash free and removal of silt, sedimentation & Debris	Silt build up of more than 1", no trash	Each year routinely as needed.	Remove all trash and silt and repair any damage to roof drains,	All Roof to be free from trash and silt and in good repair
Bioretention/ Biofiltration Facilities	Trash free and removal of silt. Clear Clogged outlets and Standing Water.	Silt build up of more than 2" no trash, Exposed soils, dead vegetation, ponded water, and excessive vegetation (see TC-30)	Monthly during rainy season, and after Storm Event	Remove trash and silt –repair and reseed exposed areas, maintain plant height so as not be shorter than 2" or higher than 5" remove all ponded water weekly inspections, (See TC-30)	All bio-filters to be free from trash and silt at all times, landscaped area to be free from exposed soil and maintained to proper height, removal of any ponding of water for more than 72 hours.
Storm Water Conveyance system Stenciling & Signing	Must be legible at all times and have a clear view.	Fading of paint or illegible letters or	Semi-annually each year & monthly during rainy season	Repaint stenciling and/or replace signs.	Appies to all stenciling and signs
Outlet Structures	Must be kept functional at all times. Clear Clogged outlets and Standing Water.	Silt, debris, trash accumulation, Ponding Water	Weekly during rainy season or within 24 hours prior to rain forecasts.	Silt, debris, trash accumulation and repair any structural damage to the outlet structures.	All outlet structures shall be kept functional at all times.

ATTACHMENT "B1"			
Annual Estimate to Maintain all BMPs	**Annual**	**10-Year**	
Landscaping & Bioretention/ Biofiltration			
Maintenance of landscaping and bio-filters is already included in the			
property management responsibilities. Additional cost:	$400	$4,000	
Irrigation System:			
Inspection and maintenance of the irrigation system is already included			
in the property management responsibilities, Additional cost:	$100	$1,000	
Roof Drains:			
Roof drain inspection and maintenance is already included in the			
property management responsibilities.			
Training:			
Once a year & training of new employees within their first			
week of employment.	$100	$1,000	
Stormdrain Signage (As needed or every 2 years)	$100	$1,000	
Trash Storage Areas:			
Inspection of trash storage area & maintenance to those areas is already			
included in the property management responsibilities. Additional c	$50	$500	
Total Estimated Annual Cost to Maintain BMPs	$750	$7,500	

ATTACHMENT "C1"

BMP TRAINING LOG			
Date MO/Day/Yr	**Type of Training**	**Personnel Trained**	**Trainer**

ATTACHMENT "D1"

INSPECTION AND MAINTENANCE LOG				
BMP TYP & LOCATION	DATE M/D/Y	Name of Person Inspecting	Description of BMP Condition/ Description repair required if any	Date Repair made and Description repair made and by whom

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego PDP-IVF:

Installation Verification Form for Priority Development Projects (PDPs)

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Applicants are responsible for providing all requested information. Do not leave any fields blank; indicate *N/A* for any requested item that is not applicable.

PART 1 General Project and Applicant Information

Table 1: Project and Applicant Information

A. Project Summary Information	**ID No. IVF-20__-____ To be assigned by DPW-WPP**
Project Name	RESQUE RANCH
Record ID (e.g., grading/improvement plan number, building permit)	PDS2016-LDGRMJ-30067
Project Address	North of Highland Valley Road, Escondido, CA 92025
Assessor's Parcel Number(s) APN(s))	276-030-48 & 49
Project Watershed (complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	San Dieguito HU, Highland HSU 905.31
B. Owner Information	
Name	4030 Goldfinch Investment, LLC c/o Phil Pace
Address	15635 Paseo Penasco, Escondido CA 92025
Email Address	phil@Philsbbq.net
Phone Number	(619) 814-0050

Document previously verified BMPs for the PDP in **Table 2**. Include the Verification Form ID No. from **Page 1** if one was issued.

****** DO NOT INCLUDE THIS PAGE UNLESS THIS IS A PARTIAL RECORD PLAN VERIFICATION ******

Table 2: Information on Verifications for Partial Record Plans Only

A: Previous Submittals

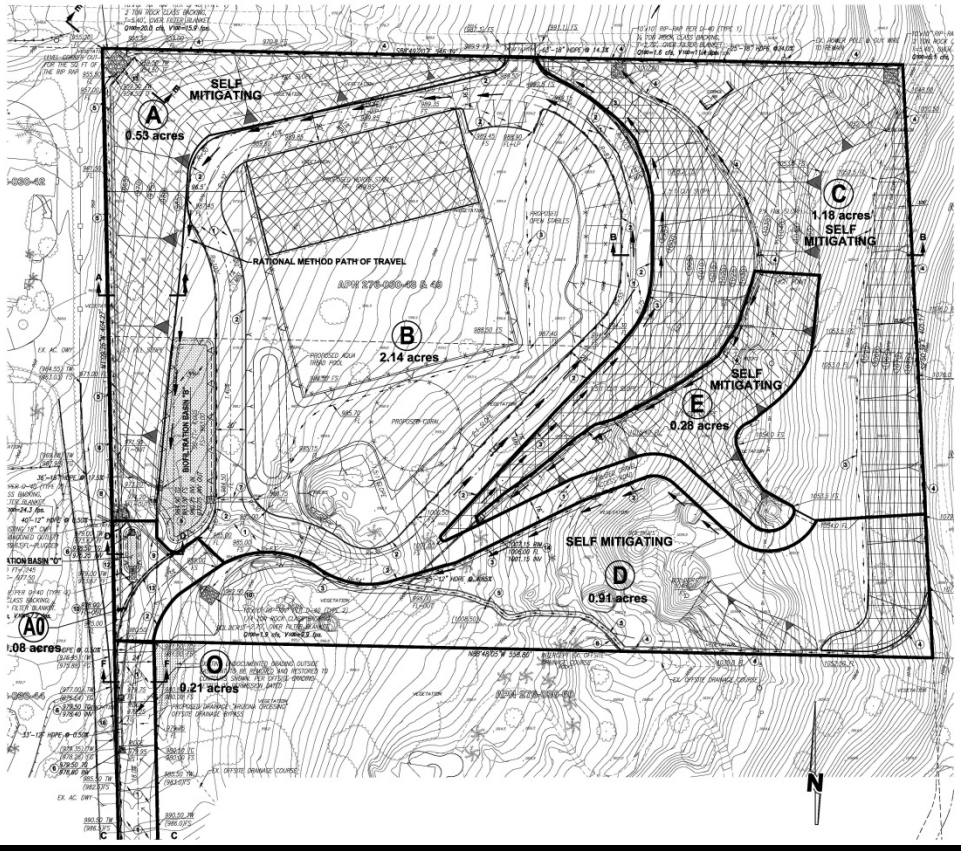
Previous Submittals	Submittal Date	Installation Verification Form ID No. if applicable (e.g., 2016-001)
1	Enter date.	Click here to enter text.
2	Enter date.	Click here to enter text.
3	Enter date.	Click here to enter text.
4	Enter date.	Click here to enter text.
5	Enter date.	Click here to enter text.

Add rows as needed

B: DMA and BMP Map

Please attach a map showing (1) all DMAs for the project site, (2) the DMAs and/or lots accepted under previous Verification Forms, and (3) the locations of Structural BMPs and Significant Site Design BMPs previously accepted OR listed in **Table 3** of this Verification Form.

SAMPLE DMA MAP



PART 2 DMA and BMP Inventory Information

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs are required to have at least one Structural BMP or Significant Site Design BMP.

- In **Part A**, list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs credited in **Worksheet B-1.1** of the BMP Design Manual for Design Capture Volume (DCV) reductions. Only Tree Wells and Dispersion Areas should be included in this inventory.
- For any DMA that contains both S-BMPs and SD-BMPs, document only the S-BMPs; you do not need to include the SD-BMPs.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

Table 3: Required Information for Structural BMPs and Significant Site Design BMPs

DMA #	BMP Information			Maintenance Category	Maintenance Agreement or Maintenance Notification Recorded Doc. #	Construction Plan Sheet #	Landscape Plan # & Sheet # (For Vegetated BMPs Only)	FOR DPW-WPP USE ONLY *Reviewer concurs that the BMP(s) may be accepted into inventory (date and initial)*
	Quantity	Description/Type of Structural BMP	BMP ID #(s)					
Part A Structural BMPs								
Add rows as needed								
Part B Significant Site Design BMPs								
		Choose an item.						
		Choose an item.						
		Choose an item.						
Add rows as needed								

PART 3 Required Attachments for All BMPs Listed in Table 3

For ALL projects, submit the following to the County inspector (check all that are attached):

☐ Photographs: A photograph of each fully constructed S-BMP or SSD-BMP (or group of BMPs).

☐ Maintenance Agreements: Copies of all approved and recorded Storm Water Maintenance Agreements (SWMAs) or Maintenance Notifications (MNs) for all S-BMPs.

Note: All BMPs proposed for County ownership will remain the responsibility of the owner listed on **Page 1** until a signed Letter of Acceptance of Completion is received by the DPW Watershed Protection Program.

For Grading and Improvement projects only, ALSO submit:

☐ Landscape Plans: An 11" X 17" copy of the most current applicable Landscape Plan sheets where the BMPs are required to be vegetated, including:

- ☐ The Certification of Completion (Form 407), AND
- ☐ The Certificate of Approval from PDS Landscape Architect

Note: For each Landscape Plan, the sheets submitted must show the location of each verified as-built BMP.

☐ Construction Plans: An 11" X 17" copy of the most current applicable approved Construction Plan sheets:

- ☐ Grading Plans, AND/OR
- ☐ Improvement Plans, AND/OR
- ☐ Precise Grading Plan(s) (only for residential subdivisions with tract homes), AND/OR
- ☐ Other (Please specify) Click here to enter text.

Note: For each Construction Plan, the sheets submitted must incorporate all of the following:

- ☐ A BMP Table, AND
- ☐ A plan/cross-section of each verified as-built BMP, AND
- ☐ The location of each verified as-built BMP

Required only for Verifications for Partial Record Plans

☐ If this is a partial record plan verification, please include the following:

- ☐ A list of previously submitted Verification Forms (**Table 2, part A**)
- ☐ A map of DMAs and BMPs (**Table 2, part B**)

PART 4 Engineer of Work Certification

By signing below, I certify that the BMP(s) listed in Table 3 of this Verification Form have been constructed and all are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign and provide your seal below.

[SEAL]

Professional Engineer's Printed Name:

____Click here to enter text._____

Email: _Click here to enter text._____

Phone Number: _Click here to enter text._____

Professional Engineer's Signed Name:

_____

Date: _Click here to enter text._____

COUNTY - OFFICIAL USE ONLY:

For County Inspectors

County Department: _____

Date verification received from EOW: _____

By signing below, County Inspector concurs that every noted BMP has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

For Building Division Only

Inspection Supervisor Name: _____

Inspector Supervisor's Signature: _____ Date: _____

PDCI & Building, along with the rest of this package, please provide to DPW WPP:

☐ A copy of the final accepted SWQMP and any accepted addendum

For Watershed Protection Program Only

Date Received: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into inventory.

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by County staff
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
- ☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

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SILTATION AND SEDIMENT CONTROL MEASURES NOTES:

1. THE SEDIMENT BASINS SHALL BE PROVIDED AT THE LOWER END OF EVERY DRAINAGE AREA PRODUCING SEDIMENT RUNOFF. THE BASINS SHALL BE MAINTAINED AND CLEANED TO DESIGN CONTOURS AFTER EVERY RUNOFF PRODUCING STORM. THE BASINS SHOULD BE SEMI-PERMANENT STRUCTURES THAT WOULD REMAIN UNTIL SOIL STABILIZING VEGETATION HAS BECOME WELL ESTABLISHED ON ALL ERODIBLE SLOPES.
2. SEDIMENT BASINS MAY NOT BE REMOVED OR MADE INOPERATIVE WITHOUT PRIOR APPROVAL OF THE COUNTY ENGINEER.
3. UTILITY TRENCHES THAT ARE CUT THROUGH BASIN DIKES OR BASIN INLET DIKES SHALL BE PLUGGED WITH GRAVEL BAGS FROM TOP OF PIPE TO TOP OF DIKE.
4. ALL UTILITY TRENCHES SHALL BE BLOCKED AT THE PRESCRIBED INTERVALS WITH A DOUBLE ROW OF GRAVEL BAGS WITH A TOP ELEVATION LEVEL WITH, AND TWO GRAVEL BAGS BELOW, THE GRADED SURFACE OF THE STREET. GRAVEL BAGS ARE TO BE PLACED WITH LAPPED COURSES. THE INTERVALS PRESCRIBED BETWEEN GRAVEL BAG BLOCKING SHALL DEPEND ON THE SLOPE OF THE GROUND SURFACE, BUT NOT EXCEED THE FOLLOWING:

GRADE OF THE STREET	INTERVAL
LESS THAN 2%	AS REQUIRED, 200 FEET MAX.
2% TO 4%	100 FEET
4% TO 10%	50 FEET
OVER 10%	25 FEET

5. AFTER UTILITY TRENCHES ARE BACKFILLED AND COMPACTED, THE SURFACE OVER SUCH TRENCHES SHALL BE MOUNDED SLIGHTLY TO PREVENT CHANNELING OF WATER IN THE TRENCH AREA. CARE SHOULD BE EXERCISED TO PROVIDE FOR CROSS FLOW AT FREQUENT INTERVALS WHERE TRENCHES ARE NOT ON THE CENTERLINE OF A CROWNED STREET.
6. ALL BUILDING PADS SHOULD BE SLOPED TOWARDS THE DRIVEWAYS AND VELOCITY CHECK DAMS PROVIDED AT THE BASE OF ALL DRIVEWAYS DRAINING INTO THE STREET.
7. PROVIDE VELOCITY CHECK DAMS IN ALL UNPAVED GRADED CHANNELS AT THE INTERVALS INDICATED BELOW:

GRADE OF CHANNEL	INTERVALS BETWEEN CHECK DAMS
LESS THAN 3%	100 FEET
3% TO 6%	50 FEET
OVER 6%	25 FEET

8. PROVIDE VELOCITY CHECK DAMS IN ALL STREET AREAS ACCORDING TO INTERVALS INDICATED BELOW. VELOCITY CHECK BAGS MAY BE CONSTRUCTED OF GRAVEL BAGS, TIMBER, OR OTHER EROSION RESISTANT MATERIALS APPROVED BY THE COUNTY ENGINEER, AND SHALL EXTEND COMPLETELY ACROSS THE STREET OR CHANNEL AT RIGHT ANGLES TO THE CENTERLINE. VELOCITY CHECK DAMS MAY ALSO SERVE AS SEDIMENT TRAPS.

GRADE OF STREET	INTERVAL	NUMBER OF BAGS HIGH
LESS THAN 2%	AS REQUIRED, 200 FEET MAX.	1
2% TO 4%	100 FEET	1
4% TO 6%	50 FEET	1
6% TO 10%	50 FEET	2
OVER 10%	25 FEET	2

9. PROVIDE A GRAVEL BAG SILT BASIN OR TRAP BY EVERY STORM DRAIN INLET TO PREVENT SEDIMENT FROM ENTERING DRAIN SYSTEM.
10. GRAVEL BAGS AND FILL MATERIAL SHALL BE STOCKPILED AT INTERVALS, READY FOR USE WHEN REQUIRED.
11. ALL EROSION CONTROL DEVICES WITHIN THE DEVELOPMENT SHOULD BE MAINTAINED DURING AND AFTER EVERY RUNOFF PRODUCING STORM, IF POSSIBLE. MAINTENANCE CREWS WOULD BE REQUIRED TO HAVE ACCESS TO ALL AREAS.
12. PROVIDE ROCK RIPRAP ON CURVES AND STEEP DROPS IN ALL EROSION PRONE DRAINAGE CHANNELS DOWNSTREAM FROM THE DEVELOPMENT. THIS PROTECTION WOULD REDUCE EROSION CAUSED BY THE INCREASED FLOWS THAT MAY BE ANTICIPATED FROM DENUDED SLOPES, OR IMPERVIOUS SURFACES.
13. ANY PROPOSED ALTERNATE CONTROL MEASURES MUST BE APPROVED IN ADVANCE BY ALL RESPONSIBLE AGENCIES; I.E.,COUNTY ENGINEER, DEPARTMENT OF ENVIRONMENTAL HEALTH, FLOOD CONTROL, OFFICE OF ENVIRONMENTAL MANAGEMENT, ETC.

EMERGENCY EROSION CONTROL MEASURES NOTES:

1. ALL BUILDING PADS TO BE DIKED AND THE DIKES MAINTAINED TO PREVENT WATER FROM FLOWING FROM THE PAD UNTIL THE STREETS AND DRIVEWAYS ARE PAVED AND WATER CAN FLOW FROM THE PADS WITHOUT CAUSING EROSION, OR CONSTRUCT DRAINAGE FACILITIES TO THE SATISFACTION OF THE COUNTY DEPARTMENT OF PUBLIC WORKS THAT WILL ALLOW WATER TO DRAIN FROM THE PAD WITHOUT CAUSING EROSION.
2. TOPS OF ALL SLOPES TO BE DIKED OR TRENCHED TO PREVENT WATER FROM FLOWING OVER THE CREST OF THE SLOPES.
3. MANUFACTURED SLOPES AND PADS SHALL BE ROUNDED VERTICALLY AND HORIZONTALLY AS APPROPRIATE TO BLEND WITH THE SURROUNDING TOPOGRAPHY.
4. AS SOON AS CUTS OR EMBANKMENTS ARE COMPLETED, BUT NOT LATER THAN OCTOBER 1, ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITH A HYDROMULCH MIXTURE OR AN EQUAL TREATMENT APPROVED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. BETWEEN OCTOBER 1 AND APRIL 30, APPROVED SLOPE PROTECTION MEASURES SHALL PROCEED IMMEDIATELY BEHIND THE EXPOSURE OF CUT SLOPES AND/OR THE CREATION OF EMBANKMENT SLOPES.
5. CATCH BASINS, DESILTING BASINS AND STORM DRAIN SYSTEMS SHALL BE INSTALLED TO THE SATISFACTION OF THE COUNTY DEPARTMENT OF PUBLIC WORKS.
6. GRAVEL BAG CHECK DAMS TO BE PLACED IN A MANNER APPROVED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS IN UNPAVED STREETS WITH GRADIENTS IN EXCESS OF 2% AND ON OR IN OTHER GRADED OR EXCAVATED AREAS AS REQUIRED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.
7. THE DEVELOPER TO MAINTAIN THE PLANTING AND EROSION CONTROL MEASURES DESCRIBED ABOVE UNTIL RELIEVED OF SAME BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. THE DEVELOPER TO REMOVE ALL SOIL INTERCEPTED BY THE GRAVEL BAGS, CATCH BASINS AND DESILTING BASINS AND KEEP THESE FACILITIES CLEAN AND FREE OF SILT AND SAND AS DIRECTED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. THE DEVELOPER SHALL REPAIR AND ERODED SLOPES AS DIRECTED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

STORMWATER MANAGEMENT NOTES:

1. DURING THE RAINY SEASON THE AMOUNT OF EXPOSED SOIL ALLOWED AT ONE TIME SHALL NOT EXCEED THAT WHICH CAN BE ADEQUATELY PROTECTED BY THE PROPERTY OWNER IN THE EVENT OF A RAINSTORM. 125% OF ALL SUPPLIES NEEDED FOR BMP MEASURES SHALL BE MAINTAINED ON THE JOB SITE IN A MANNER THAT ALLOWS FULL DEPLOYMENT AND COMPLETE INSTALLATION IN 48 HOURS OR LESS OF A FORECAST RAIN.
2. NO AREA BEING DISTURBED SHALL EXCEED 50 ACRES AT ANY GIVEN TIME WITHOUT DEMONSTRATING TO THE SAN DIEGO COUNTY DPW DIRECTOR'S SATISFACTION THAT ADEQUATE SEDIMENT AND EROSION CONTROL CAN BE MAINTAINED. ANY DISTURBED AREA THAT IS NOT ACTIVELY GRADED FOR 10 DAYS MUST BE FULLY PROTECTED FROM EROSION. UNTIL ADEQUATE LONG-TERM PROTECTIONS ARE INSTALLED, THE DISTURBED AREA SHALL BE INCLUDED WHEN CALCULATING THE ACTIVE DISTURBANCE AREA. ALL EROSION CONTROL MEASURES SHALL REMAIN INSTALLED AND MAINTAINED DURING ANY INACTIVE PERIOD.
3. THE PROPERTY OWNER IS OBLIGATED TO INSURE COMPLIANCE WITH ALL APPLICABLE STORM WATER REGULATIONS AT ALL TIMES. THE BMPs (BEST MANAGEMENT PRACTICES) THAT HAVE BEEN INCORPORATED INTO THIS PLAN SHALL BE IMPLEMENTED AND MAINTAINED TO EFFECTIVELY PREVENT THE POTENTIALLY NEGATIVE IMPACTS OF THIS PROJECT'S CONSTRUCTION ACTIVITIES ON STORM WATER QUALITY. THE MAINTENANCE OF THE BMPs IS THE PERMITTEE'S RESPONSIBILITY, AND FAILURE TO PROPERLY INSTALL OR MAINTAIN THE BMPs MAY RESULT IN ENFORCEMENT ACTION BY THE COUNTY OF SAN DIEGO OR OTHERS. IF INSTALLED BMPs FAIL THEY MUST BE REPAIRED OR REPLACED WITH AN ACCEPTABLE ALTERNATIVE WITHIN 24 HOURS, OR AS SOON AS SAFE TO DO SO.
4. ON PROJECTS OF GREATER THAN 1 ACRE, A NOTICE OF INTENT (NOI) MUST BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MUST BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF CALIFORNIA GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (PERMIT NO. CAS000002) FOR ALL OPERATIONS ASSOCIATED WITH THESE PLANS. IF APPLICABLE, THE NOI NUMBER ASSIGNED BY SWRCB FOR THIS PROJECT IS 937C375197 AND THE PERMITTEE SHALL KEEP A COPY OF THE SWPPP ON SITE AND AVAILABLE FOR REVIEW BY THE COUNTY.

STABILIZED FIBER MATRIX (SFM)

THE USE OF SFM's IS SUBJECT TO THE FOLLOWING LIMITATIONS AND RESTRICTIONS:

- SFM MAY BE USED FOR TEMPORARY EROSION CONTROL FOR DISTURBED AREAS WITH A SLOPE RATIO OF 1 VERTICAL TO 2 HORIZONTAL OR SHALLOWER, INCLUDING PAD AND SEPTIC FIELD AREAS.
- THE SFM SHALL BE APPLIED AT LEAST 24 HOURS BEFORE OR AFTER RAINFALL AND SHALL BE APPLIED TO PROVIDE 100% COVERAGE. (I.E. APPLIED FROM MULTIPLE DIRECTIONS AND ANGLES).
- THE APPLICATION AREA MUST BE PROTECTED WITH BROW DITCHES AND/OR DIVERSION BERMS AT THE TOP OF SLOPES TO DIVERT FLOW FROM THE FACE OF THE SLOPE.
- FOR PERMANENT EROSION CONTROL PURPOSES, SFM MUST BE INSTALLED IN CONJUNCTION WITH SEEDED EROSION CONTROL VEGETATION OR HAND PLANTINGS. AS WITH ALL OTHER APPLICATIONS, SFM WILL NOT BE CONSIDERED PERMANENT UNTIL 70% VEGETATION ESTABLISHMENT.
- COVERAGE AND CONCENTRATION: FOR EACH ACRE COVERED, THE MINIMUM APPLICATION VOLUME SHALL BE 10 GALLONS NON-TOXIC WATER-PERMEABLE SOIL-STABILIZING LIQUID EMULSION WITH 3000 POUNDS OF HYDRAULIC MULCH. THE EMULSION MUST BE DESIGNED TO PROTECTSOIL, PREVENT EROSION, AND FLOCCULATE (CLUMP) SEDIMENT.
- A LETTER FROM THE HYDROSEED CONTRACTOR CERTIFYING THAT THE SFM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED APPLICATION RATES, COVERAGE, AND MANUFACTURERS DILUTION RATIO SHALL BE SUBMITTED TO THE COUNTY INSPECTOR FOR APPROVAL.

BONDED FIBER MATRIX (BFM)

THE USE OF BFM's IS SUBJECT TO THE FOLLOWING LIMITATIONS AND RESTRICTIONS:

- APPLICATION RATES SHALL BE 3500 POUNDS PER ACRE MINIMUM FOR 2:1 OR SHALLOWER SLOPES AND 4000 POUNDS PER ACRE FOR SLOPES STEEPER THAN 2:1.
- BFM SHALL BE APPLIED AT LEAST 24 HOURS BEFORE OR AFTER RAINFALL.
- THE SITE MUST BE PROTECTED WITH BROW DITCHES AND/OR DIVERSION BERMS AT THE TOP OF SLOPES TO DIVERT FLOW FROM THE FACE OF THE SLOPE.
- BFM SHALL BE APPLIED TO PROVIDE 100% COVERAGE (i.e. APPLICATION FROM MULTIPLE ANGLES).
- FOR PERMANENT EROSION CONTROL PURPOSES, BFM MUST BE INSTALLED IN CONJUNCTION WITH SEEDED EROSION CONTROL VEGETATION.
- A LETTER FROM THE HYDROSEED CONTRACTOR CERTIFYING THAT THE BFM HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED APPLICATION RATES AND COVERAGE REQUIREMENTS SHALL BE SUBMITTED TO THE COUNTY INSPECTOR FOR APPROVAL.

SEWER LATERAL CONSTRUCTION NOTES:

1. THE APPLICANT/OWNER PROPOSING TO CONNECT TO SAN DIEGO COUNTY SANITATION DISTRICT (DISTRICT) SEWER SYSTEM SHALL OBTAIN A RESIDENTIAL WASTEWATER DISCHARGE PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS. THE APPLICANT/OWNER SHALL MAKE A WRITTEN APPLICATION TO WASTEWATER MANAGEMENT THROUGH DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES (BUILDING PERMIT COUNTER). FOR INFORMATION, CONTACT THE WASTEWATER MANAGEMENT COUNTER AT 858-495-5717.
2. THE CONNECTION (SADDLE ONLY) TO THE DISTRICT SEWER SHALL BE INSTALLED BY DISTRICT PERSONNEL ONLY (FOR FIELD COORDINATION, CONTACT DISTRICT FIELD OFFICE AT 619-660-2007). ALL COSTS ASSOCIATED WITH PERMITS AND CONSTRUCTION OF THE SEWER LATERAL SHALL BE BORNE BY THE PROPERTY OWNER.
3. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NO PRIVATE RESIDENCES ARE SUBJECT TO A SEWAGE BACKUP OR SPILL DURING SEWER LATERAL CONNECTION.
4. THE CONTRACTOR SHALL BE LIABLE FOR ALL CLEANUP, DAMAGES, AND RESULTANT FINES IN THE EVENT OF A SEWAGE SPILL.
5. ALL SEWER LATERAL RELATED WORK SHALL CONFORM TO SAN DIEGO REGIONAL STANDARD DRAWINGS SP-01, SS-01 OR SS-02, SS-03, SS-0 4 AND SC-01 (TYPE B).
6. THE PRIVATE SEWER LATERAL CONNECTION AND CLEANOUT AT THE PROPERTY LINE IS TO BE INSPECTED AND APPROVED BY THE DEPARTMENT OF PLANNING AND DEVELOPMENT SERVICES BUILDING DIVISION.
7. EACH LOT WILL BE SERVED BY A FOUR (4) INCH DIAMETER MINIMUM SIZE PVC SEWER LATERAL. LOCATION OF SEWER LATERAL AS-CONSTRUCTED WITH STATIONS SHALL BE SHOWN ON THESE PLANS BY THE ENGINEER OF WORK PRIOR TO "RECORD PLAN" APPROVAL BY THE DISTRICT.
8. THE PROPOSED SEWER LATERAL(S) WILL BE CONSTRUCTED TO GRAVITY FLOW WITHIN THE EXISTING COUNTY ROAD RIGHT-OF-WAY.

BIOFILTRATION BASIN MEDIA

PER COUNTY OF SAN DIEGO 2014 LID HANDBOOK, APPENDIX C – FACT SHEETS.

3" MULCH LAYER (MANDATORY)
A MINIMUM OF 3 INCHES OF WELL-AGED, SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST 12 MONTHS IS PROVIDED. MULCH MUST BE NON-FLOATING TO AVOID CLOGGING OF OVERFLOW STRUCTURE.

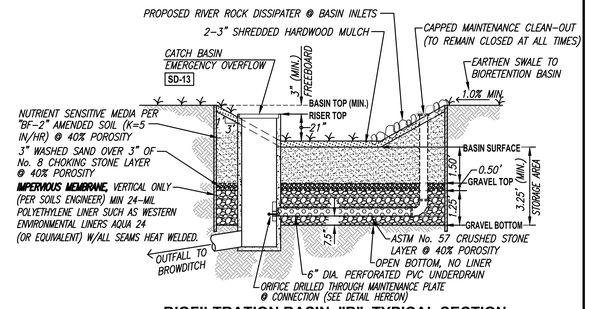
18" AMENDED SOIL LAYER
COMPOSITION AND TEXTURE:
65% SAND, 20% SANDY LOAM, & 15% COMPOST (FROM VEGETATION-BASED FEEDSTOCK). ANIMAL WASTES OR BY-PRODUCTS SHOULD NOT BE APPLIED.

PERMEABILITY:
5 IN/HR INFILTRATION RATE FOR THE FLOW-BASED SUSMP METHOD (1-6IN/HR FOR ALTERNATIVE DESIGNS, AS APPROVED BY LOCAL JURISDICTION).

CHEMICAL COMPOSITION: TOTAL PHOSPHORUS < 15 PARTS PER MILLION (PPM); PH 6-8; CATION EXCHANGE CAPACITY > 5 MILLIEQUIVALENTS PER 100 GRAMS (MEQ/100 G) OF SOIL; ORGANIC MATTER CONTENT < 5 PERCENT BY WEIGHT.

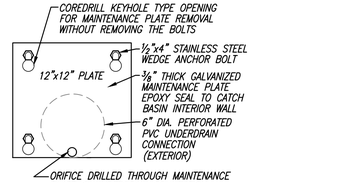
DRAINAGE LAYER
SEPARATE SOIL MEDIA FROM UNDERDRAIN LAYER WITH 3 INCHES OF WASHED SAND (ASTM NO. 33), FOLLOWED BY 3 INCHES OF CHOKING STONE (ASTM NO. 8), OVER A 1.25-FOOT ENVELOPE OF ASTM NO. 57 STONE.

SURFACE VEGETATION
AS SPECIFIED BY THE LANDSCAPE ARCHITECT PLANS.



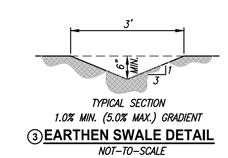
BIOFILTRATION BASIN "B" TYPICAL SECTION

TYPICAL DETAIL & OUTLET CONNECTION
BIOFILTRATION BASIN BF-1 & BF-2 W/NUTRIENT SENSITIVE MEDIA DESIGN
NOT-TO-SCALE



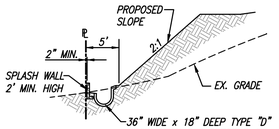
MAINTENANCE PLATE DETAIL

ATTACH TO INTERIOR INLET WALL OF CATCH BASIN



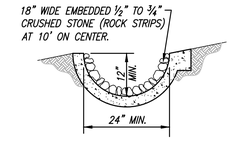
③ EARTHEN SWALE DETAIL

NOT-TO-SCALE



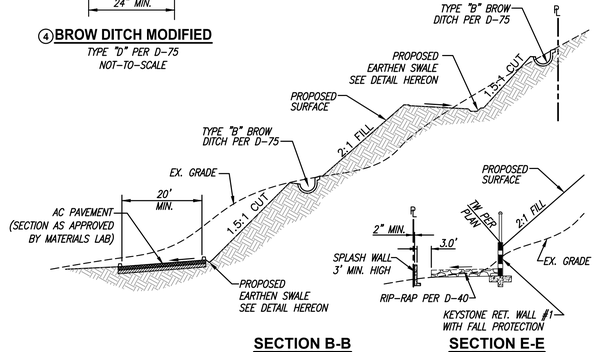
SECTION A-A

NOT TO SCALE



④ BROW DITCH MODIFIED

TYPE "D" PER D-75
NOT-TO-SCALE

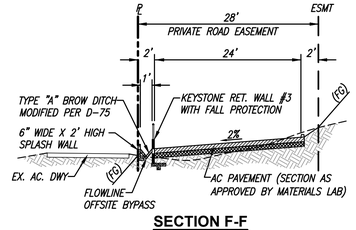


SECTION B-B

NOT TO SCALE

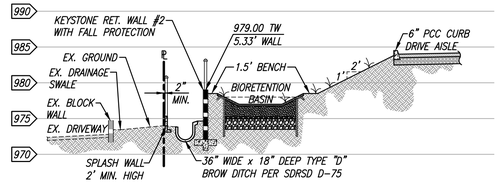
SECTION E-E

NOT TO SCALE



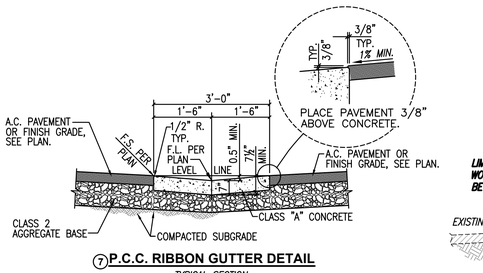
SECTION F-F

NOT TO SCALE



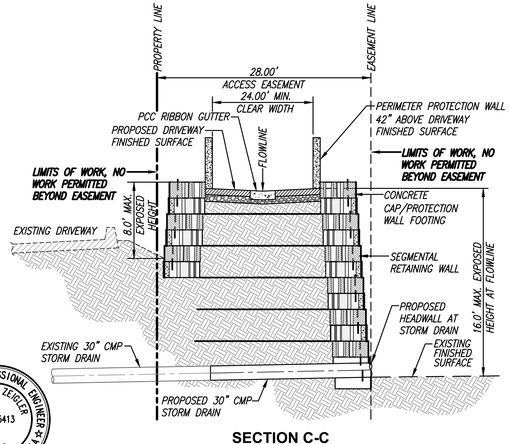
SECTION D-D

NOT TO SCALE



⑦ P.C.C. RIBBON GUTTER DETAIL

TYPICAL SECTION
NOT-TO-SCALE



SECTION C-C

DRIVEWAY RETAINING WALL SECTION
NO SCALE

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER — JOSHUA R. ZEIGLER — No. 85413 — CIVIL — STATE OF CALIFORNIA

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE & COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS & PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY & NOT TO BE LIMITED TO NORMAL WORKING HOURS & CONSTRUCTION CONTRACTOR AGREES TO DEFEND, INDEMNIFY & HOLD CO. OF SAN DIEGO & DESIGN PROFESSIONAL HARMLESS FROM ANY & ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

COUNTY APPROVED CHANGES

NO.	Description	Approved by	Date

BENCH MARK

DESCRIPTION: CHISELED SQUARE
LOCATION: AT THE TOP OF PEDRAMP ON S.E. CORNER OF SIERRA LINDA DRIVE AND VISTA BONITA
RECORD FROM: #425 CITY OF ESCONDIDO BENCHMARK BOOK
ELEVATION: 504.07 DATUM: MSL

RECORD PLAN

JOSHUA R. ZEIGLER DATE
R.C.E. No: 85413
EXPIRES: 9-30-20

PRIVATE CONTRACT

SHEET 2	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	16 SHEETS

GRADING PLAN FOR:
RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"

CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER

BY: DATE

ENGINEER OF WORK: JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-20

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

"NOT FOR CONSTRUCTION"

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

PLOT DATE: 11/27/2018 8:07 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV

AD PERMIT AND GRADING PLAN NOTES:

PRE-CONSTRUCTION GRADING AND/OR IMPROVEMENTS: (PRIOR TO ANY CLEARING, GRUBBING, TRENCHING, GRADING, OR ANY LAND DISTURBANCES.)

(CULTURAL RESOURCES)

CULT#GR-1 ARCHAEOLOGICAL MONITORING – PRECONSTRUCTION MEETING [PDS, FEE X2]
INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR SIGNIFICANCE – CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE COUNTY APPROVED PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL ATTEND THE PRE-CONSTRUCTION MEETING WITH THE CONTRACTORS TO EXPLAIN AND COORDINATE THE REQUIREMENTS OF THE ARCHAEOLOGICAL MONITORING PROGRAM. THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL MONITOR THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS IN ALL AREAS IDENTIFIED FOR DEVELOPMENT INCLUDING OFF-SITE IMPROVEMENTS. THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL ALSO EVALUATE FILL SOILS TO ENSURE THAT THEY ARE CLEAN OF CULTURAL RESOURCES. THE ARCHAEOLOGICAL MONITORING PROGRAM SHALL COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES. **DOCUMENTATION:** THE APPLICANT SHALL HAVE THE CONTRACTED PROJECT ARCHEOLOGIST AND KUMEYAAY NATIVE AMERICAN ATTEND THE PRECONSTRUCTION MEETING TO EXPLAIN THE MONITORING REQUIREMENTS. **TIMING:** PRIOR TO ANY CLEARING, GRUBBING, TRENCHING, GRADING, OR ANY LAND DISTURBANCES THIS CONDITION SHALL BE COMPLETED. **MONITORING:** THE [DPW, PDCI] SHALL CONFIRM THE ATTENDANCE OF THE APPROVED PROJECT ARCHAEOLOGIST.

DURING CONSTRUCTION: (THE FOLLOWING ACTIONS SHALL OCCUR THROUGHOUT THE DURATION OF THE GRADING CONSTRUCTION).

(CULTURAL RESOURCES)

CULT#GR-2 ARCHAEOLOGICAL MONITORING – DURING CONSTRUCTION [PDS, FEE X2]
INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, A CULTURAL RESOURCE GRADING MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL MONITOR THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS IN ALL AREAS IDENTIFIED FOR DEVELOPMENT INCLUDING OFF-SITE IMPROVEMENTS. THE ARCHAEOLOGICAL MONITORING PROGRAM SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS DURING EARTH-DISTURBING ACTIVITIES:

a. DURING THE ORIGINAL CUTTING OF PREVIOUSLY UNDISTURBED DEPOSITS, THE PROJECT ARCHAEOLOGIST AND KUMEYAAY NATIVE AMERICAN MONITOR SHALL BE ONSITE AS DETERMINED NECESSARY BY THE PROJECT ARCHAEOLOGIST. INSPECTIONS WILL VARY BASED ON THE RATE OF EXCAVATION, THE MATERIALS EXCAVATED, AND THE PRESENCE AND ABUNDANCE OF ARTIFACTS AND FEATURES. THE FREQUENCY AND LOCATION OF INSPECTIONS WILL BE DETERMINED BY THE PROJECT ARCHAEOLOGIST IN CONSULTATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR. MONITORING OF CUTTING OF PREVIOUSLY DISTURBED DEPOSITS WILL BE DETERMINED BY THE PROJECT ARCHAEOLOGIST IN CONSULTATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR.

b. IN THE EVENT THAT PREVIOUSLY UNIDENTIFIED POTENTIALLY SIGNIFICANT CULTURAL RESOURCES ARE DISCOVERED:

1. THE PROJECT ARCHAEOLOGIST OR THE KUMEYAAY NATIVE AMERICAN MONITOR SHALL HAVE THE AUTHORITY TO DIVERT OR TEMPORARILY HALT GROUND DISTURBANCE OPERATIONS IN THE AREA OF DISCOVERY TO ALLOW EVALUATION OF POTENTIALLY SIGNIFICANT CULTURAL RESOURCES.

2. THE PROJECT ARCHAEOLOGIST, IN CONSULTATION WITH THE PDS STAFF ARCHAEOLOGIST AND THE KUMEYAAY NATIVE AMERICAN MONITOR, SHALL DETERMINE THE SIGNIFICANCE OF THE DISCOVERED RESOURCES.

3. CONSTRUCTION ACTIVITIES WILL BE ALLOWED TO RESUME IN THE AFFECTED AREA ONLY AFTER THE PDS STAFF ARCHAEOLOGIST HAS CONCURRED WITH THE EVALUATION.

4. ISOLATES AND CLEARLY NON-SIGNIFICANT DEPOSITS SHALL BE MINIMALLY DOCUMENTED IN THE FIELD. SHOULD THE ISOLATES AND/OR NON-SIGNIFICANT DEPOSITS NOT BE COLLECTED BY THE PROJECT ARCHAEOLOGIST, THEN THE KUMEYAAY NATIVE AMERICAN MONITOR MAY COLLECT THE CULTURAL MATERIAL FOR TRANSFER TO A TRIBAL CURATION FACILITY OR REPATRIATION PROGRAM.

5. A RESEARCH DESIGN AND DATA RECOVERY PROGRAM (PROGRAM) IS REQUIRED TO MITIGATE IMPACTS TO IDENTIFIED SIGNIFICANT CULTURAL RESOURCES. THE PROGRAM SHALL INCLUDE (1) REASONABLE EFFORTS TO PRESERVE (AVOIDANCE) "UNIQUE" CULTURAL RESOURCES OR SACRED SITES; (2) THE CAPPING OF IDENTIFIED SACRED SITES OR UNIQUE CULTURAL RESOURCES AND PLACEMENT OF DEVELOPMENT OVER THE CAP, IF AVOIDANCE IS INFEASIBLE; AND (3) DATA RECOVERY FOR NON-UNIQUE CULTURAL RESOURCES. THE PREFERRED OPTION IS PRESERVATION (AVOIDANCE).

6. THE RESEARCH DESIGN AND DATA RECOVERY PROGRAM SHALL BE PREPARED BY THE PROJECT ARCHAEOLOGIST IN COORDINATION WITH THE KUMEYAAY NATIVE AMERICAN MONITOR.

7. THE COUNTY ARCHAEOLOGIST SHALL REVIEW AND APPROVE THE PROGRAM, WHICH SHALL BE CARRIED OUT USING PROFESSIONAL ARCHAEOLOGICAL METHODS.

AD PERMIT AND GRADING PLAN NOTES CONTINUED:

c. IF ANY HUMAN REMAINS ARE DISCOVERED:

1. THE PROPERTY OWNER OR THEIR REPRESENTATIVE SHALL CONTACT THE COUNTY CORONER AND THE PDS STAFF ARCHAEOLOGIST.

2. UPON IDENTIFICATION OF HUMAN REMAINS, NO FURTHER DISTURBANCE SHALL OCCUR IN THE AREA OF THE FIND UNTIL THE COUNTY CORONER HAS MADE THE NECESSARY FINDINGS AS TO ORIGIN.

3. IF THE REMAINS ARE DETERMINED TO BE OF NATIVE AMERICAN ORIGIN, THE MOST LIKELY DESCENDANT (MLD), AS IDENTIFIED BY THE NATIVE AMERICAN HERITAGE COMMISSION (NAHC), SHALL BE CONTACTED BY THE PROPERTY OWNER OR THEIR REPRESENTATIVE IN ORDER TO DETERMINE PROPER TREATMENT AND DISPOSITION OF THE REMAINS.

4. THE IMMEDIATE VICINITY WHERE THE NATIVE AMERICAN HUMAN REMAINS ARE LOCATED IS NOT TO BE DAMAGED OR DISTURBED BY FURTHER DEVELOPMENT ACTIVITY UNTIL CONSULTATION WITH THE MLD REGARDING THEIR RECOMMENDATIONS AS REQUIRED BY PUBLIC RESOURCES CODE SECTION 5097.98 HAS BEEN CONDUCTED.

5. PUBLIC RESOURCES CODE §5097.98, CEQA §15064.5 AND HEALTH & SAFETY CODE §7050.5 SHALL BE FOLLOWED IN THE EVENT THAT HUMAN REMAINS ARE DISCOVERED.

DOCUMENTATION: THE APPLICANT SHALL IMPLEMENT THE ARCHAEOLOGICAL MONITORING PROGRAM PURSUANT TO THIS CONDITION. **TIMING:** THE FOLLOWING ACTIONS SHALL OCCUR THROUGHOUT THE DURATION OF THE EARTH DISTURBING ACTIVITIES. **MONITORING:** THE [DPW, PDCI] SHALL MAKE SURE THAT THE PROJECT ARCHEOLOGIST IS ON-SITE PERFORMING THE MONITORING DUTIES OF THIS CONDITION. THE [DPW, PDCI] SHALL CONTACT THE [PDS, PPD] IF THE PROJECT ARCHEOLOGIST OR APPLICANT FAILS TO COMPLY WITH THIS CONDITION.

ROUGH GRADING: (PRIOR TO ROUGH GRADING APPROVAL AND ISSUANCE OF ANY BUILDING PERMIT).

(CULTURAL RESOURCES)

CULT#GR-3 ARCHAEOLOGICAL MONITORING – ROUGH GRADING [PDS, FEE] INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST SHALL PREPARE ONE OF THE FOLLOWING REPORTS UPON COMPLETION OF THE EARTH-DISTURBING ACTIVITIES THAT REQUIRE MONITORING AND COMMUNICATE WITH LOCAL TRIBES AS REQUIRED BELOW:

a. IF NO ARCHAEOLOGICAL RESOURCES ARE ENCOUNTERED DURING EARTH-DISTURBING ACTIVITIES, THEN SUBMIT A FINAL NEGATIVE MONITORING REPORT SUBSTANTIATING THAT EARTH-DISTURBING ACTIVITIES ARE COMPLETED AND NO CULTURAL RESOURCES WERE ENCOUNTERED. ARCHAEOLOGICAL MONITORING LOGS SHOWING THE DATE AND TIME THAT THE MONITOR WAS ON SITE AND ANY COMMENTS FROM THE KUMEYAAY NATIVE AMERICAN MONITOR MUST BE INCLUDED IN THE NEGATIVE MONITORING REPORT.

b. IF ARCHAEOLOGICAL RESOURCES WERE ENCOUNTERED DURING THE EARTH DISTURBING ACTIVITIES, THE PROJECT ARCHAEOLOGIST SHALL PROVIDE AN ARCHAEOLOGICAL MONITORING REPORT STATING THAT THE FIELD MONITORING ACTIVITIES HAVE BEEN COMPLETED, AND THAT RESOURCES HAVE BEEN ENCOUNTERED. THE REPORT SHALL DETAIL ALL CULTURAL ARTIFACTS AND DEPOSITS DISCOVERED DURING MONITORING AND THE ANTICIPATED TIME SCHEDULE FOR COMPLETION OF THE CURATION AND/OR REPATRIATION PHASE OF THE MONITORING.

DOCUMENTATION: THE APPLICANT SHALL SUBMIT THE ARCHAEOLOGICAL MONITORING REPORT TO THE [PDS, PPD] FOR REVIEW AND APPROVAL. ONCE APPROVED, A FINAL COPY OF THE REPORT SHALL BE SUBMITTED TO THE SOUTH COASTAL INFORMATION CENTER, THE VIEJAS BAND OF MISSION INDIANS, AND ANY CULTURALLY AFFILIATED TRIBE THAT REQUESTS A COPY OF THE REPORT. **TIMING:** UPON COMPLETION OF ALL EARTH-DISTURBING ACTIVITIES, AND PRIOR TO ROUGH GRADING FINAL INSPECTION (GRADING ORDINANCE SEC 87.421.A.2), THE REPORT SHALL BE COMPLETED. **MONITORING:** THE [PDS, PPD] SHALL REVIEW THE REPORT OR FIELD MONITORING MEMO FOR COMPLIANCE WITH THE PROJECT MMRP, AND INFORM [DPW, PDCI] THAT THE REQUIREMENT IS COMPLETED.

FINAL GRADING RELEASE: (PRIOR TO ANY OCCUPANCY, FINAL GRADING RELEASE, OR USE OF THE PREMISES IN RELIANCE OF THIS PERMIT).

(CULTURAL RESOURCES)

CULT#GR-4 ARCHAEOLOGICAL MONITORING – FINAL GRADING [PDS, FEE] INTENT: IN ORDER TO COMPLY WITH THE COUNTY OF SAN DIEGO GUIDELINES FOR DETERMINING SIGNIFICANCE AND REPORT FORMAT AND CONTENT REQUIREMENTS FOR CULTURAL RESOURCES, AN ARCHAEOLOGICAL MONITORING PROGRAM SHALL BE IMPLEMENTED. **DESCRIPTION OF REQUIREMENT:** THE PROJECT ARCHAEOLOGIST SHALL PREPARE A FINAL REPORT THAT DOCUMENTS THE RESULTS, ANALYSIS, AND CONCLUSIONS OF ALL PHASES OF THE ARCHAEOLOGICAL MONITORING PROGRAM IF CULTURAL RESOURCES WERE ENCOUNTERED DURING EARTH-DISTURBING ACTIVITIES. THE REPORT AND COMMUNICATIONS SHALL INCLUDE THE FOLLOWING, IF APPLICABLE:

a. DEPARTMENT OF PARKS AND RECREATION PRIMARY AND ARCHAEOLOGICAL SITE FORMS.

b. DAILY MONITORING LOGS

c. EVIDENCE THAT THE DISPOSITION OF ALL CULTURAL MATERIALS HAS BEEN COMPLETED AS FOLLOWS:

(1) EVIDENCE THAT ALL PREHISTORIC MATERIALS COLLECTED DURING THE ARCHAEOLOGICAL MONITORING PROGRAM HAVE BEEN SUBMITTED TO A SAN DIEGO CURATION FACILITY OR A CULTURALLY AFFILIATED NATIVE AMERICAN TRIBAL CURATION FACILITY THAT MEETS FEDERAL STANDARDS PER 36 CFR PART 79, AND, THEREFORE, WOULD BE PROFESSIONALLY CURATED AND MADE AVAILABLE TO OTHER ARCHAEOLOGISTS/RESEARCHERS FOR FURTHER STUDY. THE COLLECTIONS AND ASSOCIATED RECORDS, INCLUDING TITLE, SHALL BE TRANSFERRED TO THE SAN DIEGO CURATION FACILITY OR CULTURALLY AFFILIATED NATIVE AMERICAN TRIBAL CURATION FACILITY AND SHALL BE ACCOMPANIED BY PAYMENT OF THE FEES NECESSARY FOR PERMANENT CURATION. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE CURATION FACILITY STATING THAT THE PREHISTORIC ARCHAEOLOGICAL MATERIALS HAVE BEEN RECEIVED AND THAT ALL FEES HAVE BEEN PAID.

OR

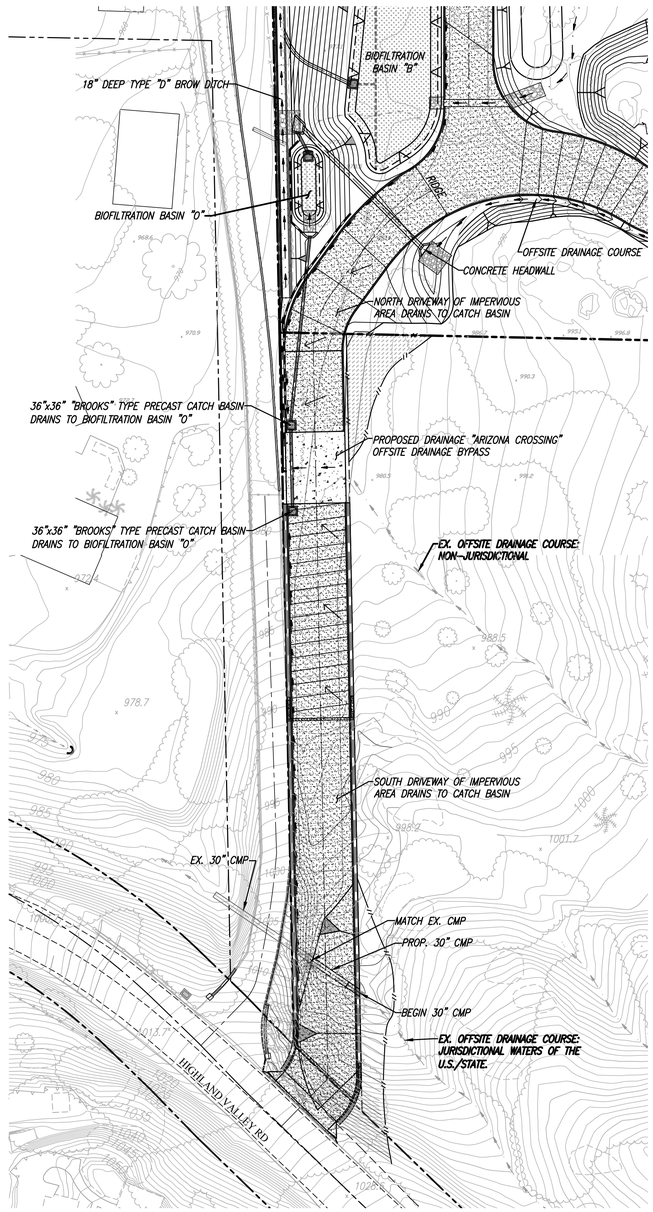
EVIDENCE THAT ALL PREHISTORIC MATERIALS COLLECTED DURING THE ARCHAEOLOGICAL MONITORING PROGRAM HAVE BEEN RETURNED TO A NATIVE AMERICAN GROUP OF APPROPRIATE TRIBAL AFFINITY. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE NATIVE AMERICAN TRIBE TO WHOM THE CULTURAL RESOURCES HAVE BEEN REPATRIATED IDENTIFYING THAT THE ARCHAEOLOGICAL MATERIALS HAVE BEEN RECEIVED.

AD PERMIT AND GRADING PLAN NOTES CONTINUED:

(2) HISTORIC MATERIALS SHALL BE CURATED AT A SAN DIEGO CURATION FACILITY AND SHALL NOT BE CURATED AT A TRIBAL CURATION FACILITY OR REPATRIATED. THE COLLECTIONS AND ASSOCIATED RECORDS, INCLUDING TITLE, SHALL BE TRANSFERRED TO THE SAN DIEGO CURATION FACILITY AND SHALL BE ACCOMPANIED BY PAYMENT OF THE FEES NECESSARY FOR PERMANENT CURATION. EVIDENCE SHALL BE IN THE FORM OF A LETTER FROM THE CURATION FACILITY STATING THAT THE HISTORIC MATERIALS HAVE BEEN RECEIVED AND THAT ALL FEES HAVE BEEN PAID.

d. IF NO CULTURAL RESOURCES ARE DISCOVERED, A NEGATIVE MONITORING REPORT MUST BE SUBMITTED STATING THAT THE ARCHAEOLOGICAL MONITORING ACTIVITIES HAVE BEEN COMPLETED. GRADING MONITORING LOGS MUST BE SUBMITTED WITH THE NEGATIVE MONITORING REPORT.

DOCUMENTATION: THE APPLICANT'S ARCHAEOLOGIST SHALL PREPARE THE FINAL REPORT AND SUBMIT IT TO THE [PDS, PPD] FOR APPROVAL. ONCE APPROVED, A FINAL COPY OF THE REPORT SHALL BE SUBMITTED TO THE SOUTH COASTAL INFORMATION CENTER (SCIC), THE VIEJAS BAND OF MISSION INDIANS, AND ANY CULTURALLY AFFILIATED TRIBE THAT REQUESTS A COPY OF THE REPORT. **TIMING:** PRIOR TO ANY OCCUPANCY, FINAL GRADING RELEASE, OR USE OF THE PREMISES IN RELIANCE OF THIS PERMIT, THE FINAL REPORT SHALL BE PREPARED. **MONITORING:** THE [PDS, PPD] SHALL REVIEW THE FINAL REPORT FOR COMPLIANCE WITH THIS CONDITION AND THE REPORT FORMAT GUIDELINES. UPON ACCEPTANCE OF THE REPORT, [PDS, PPD] SHALL INFORM [PDS, LDR] AND [DPW, PDCI] THAT THE REQUIREMENT IS COMPLETE AND THE BOND AMOUNT CAN BE RELINQUISHED. IF THE MONITORING WAS BONDED SEPARATELY, THEN [PDS, PPD] SHALL INFORM [PDS OR DPW FISCAL] TO RELEASE THE BOND BACK TO THE APPLICANT.



DRAIN TO BMP'S DETAIL
SCALE: 1" = 30'

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER – JOSHUA R. ZEIGLER – No. 85413 – CIVIL – STATE OF CALIFORNIA

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE & COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS & PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY & NOT TO BE LIMITED TO NORMAL WORKING HOURS & CONSTRUCTION CONTRACTOR AGREES TO DEFEND, INDEMNIFY & HOLD CO. OF SAN DIEGO & DESIGN PROFESSIONAL HARMLESS FROM ANY & ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

COUNTY APPROVED CHANGES

NO.	Description	Approved by	Date

BENCH MARK
DESCRIPTION: CHISELED SQUARE
LOCATION: AT THE TOP OF PEDRAMP ON S.E. CORNER OF SIERRA LINDA DRIVE AND VISTA BONITA
RECORD FROM: #425 CITY OF ESCONDIDO BENCHMARK BOOK
ELEVATION: 504.07 DATUM: MSL

RECORD PLAN
JOSHUA R. ZEIGLER DATE
R.C.E. No: 85413
EXPIRES: 9-30-20

PRIVATE CONTRACT

SHEET 3	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	16 SHEETS

GRADING PLAN FOR:
RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"
CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER
BY: DATE

ENGINEER OF WORK:
JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-20

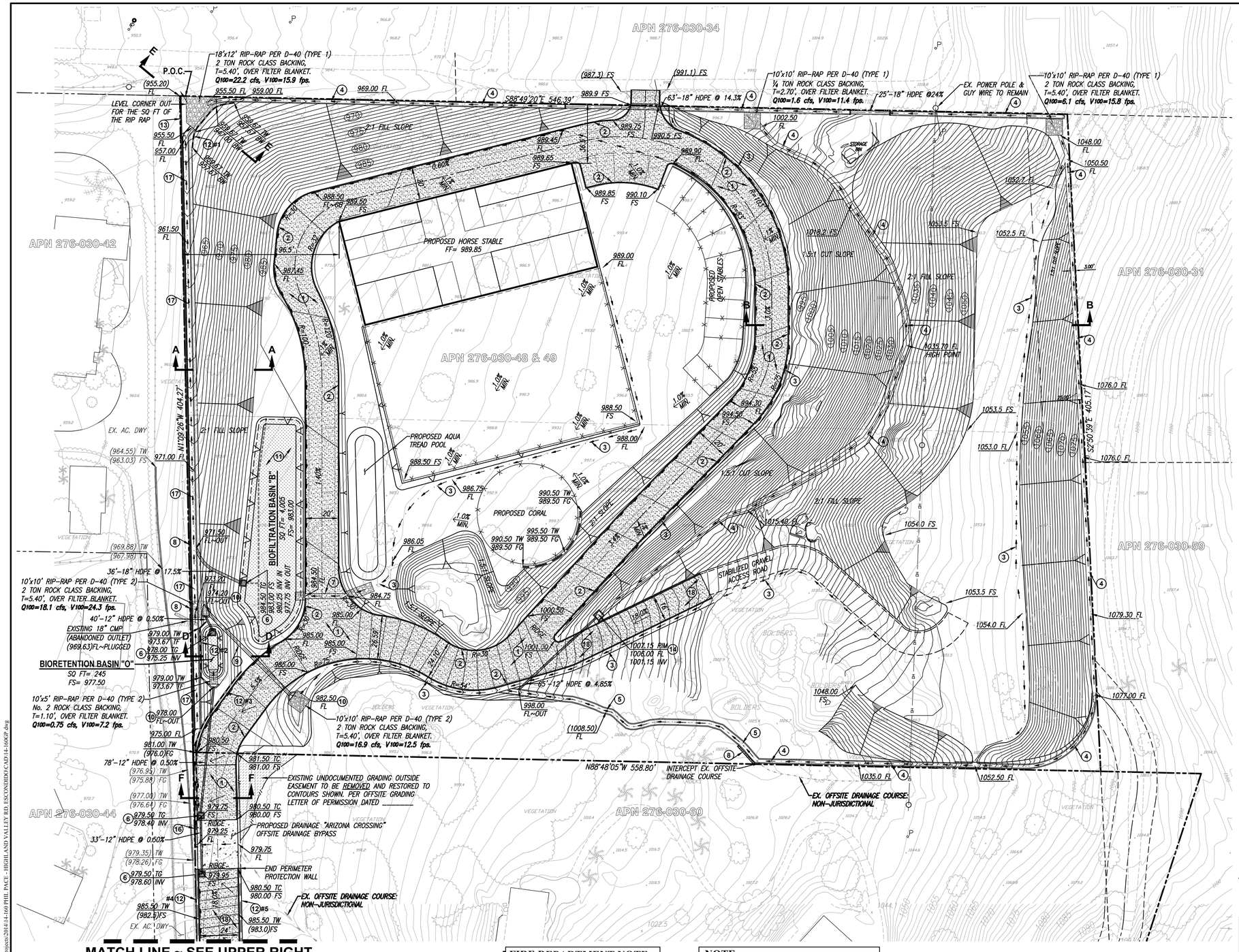
GRADING PERMIT NO: PDS2016-LDGRMJ-30067

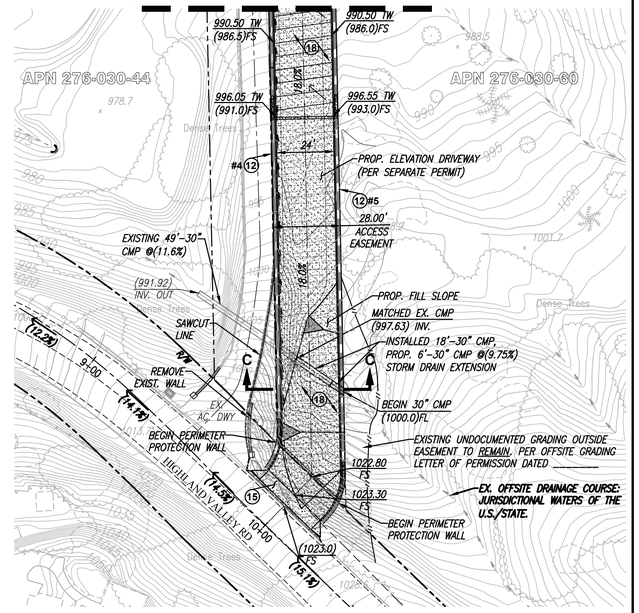
"NOT FOR CONSTRUCTION"

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

PLOT DATE: 11/27/2018 8:08 AM S:\Spear_Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg

SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV





CONSTRUCTION NOTES

1. CONSTRUCT 4" AC PAVEMENT OVER 8" CLASS II A.B. WITH 95% COMPACTED NATIVE. (STRUCTURAL SECTION SHALL BE AS APPROVED BY DPW MATERIAL LAB).
2. CONSTRUCT 6" AC BERM TYPE A PER SDRSD G-5.
3. EARTHEN SWALE @1.0% MIN. PER DETAIL SHEET 3.
4. CONSTRUCT 24" WIDE TYPE "B" BROW DITCH PER SDRSD D-75.
5. CONSTRUCT 36" WIDE TYPE "D" BROW DITCH PER SDRSD D-75.
6. 36"x36" "BROOKS" TYPE PRECAST CATCH BASIN.
7. CONSTRUCT 3.0' WIDE P.C.C. RIBBON GUTTER PER DETAIL SHEET 2.
8. CONSTRUCT SPLASH WALL 15' LONG x 3' MIN. HIGH AT INTERSECTIONS.
9. INSTALL 71'-24" HDPE @10.5%
10. CONSTRUCT CONCRETE HEADWALL PER SDRSD D-34.
11. CONSTRUCT BIOFILTRATION BASIN W/NUTRIENT SENSITIVE MEDIA PER "BF-2" & PER DETAIL SHEET 2.
12. CONSTRUCT KEYSTONE RETAINING WALLS PER SHEETS 6 – 16.
13. CONSTRUCT SPLASH WALL 26' LONG x 3' MIN. HIGH AT END WEST BOUNDARY.
14. CONSTRUCT TYPE 'F' CATCH BASIN PER SDRSD D-7.
15. CONSTRUCT 30' WIDE AC DRIVEWAY PER SDRSD DS-07.
16. CONSTRUST SPLASH WALL 73' LONG X 2' HIGH MIN.
17. CONSTRUCT 36" WIDE x 18" DEEP TYPE "D" BROW DITCH PER SDRSD D-75 WITH SPLASH WALL 2' MIN. HIGH ALONG WEST BOUNDARY.
18. CONSTRUCT 7" PCC PAVEMENT OVER 95% COMPACTED NATIVE, (STRUCTURAL SECTION SHALL BE AS APPROVED BY DPW MATERIAL LAB).

DPW NOTE:
ALL GRADING DETAILS WILL BE IN ACCORDANCE WITH SAN DIEGO COUNTY STANDARD DRAWINGS DS-8, DS-10, DS-11 & D-75.

30 15 0 30 60 90
SCALE: 1" = 30'

FIRE DEPARTMENT NOTE:
ACCESS ROADS EXCEEDING 15% WILL REQUIRE PORTLAND CEMENT CONCRETE WITH RAKE OR BROOM FINISH.

UTILITY NOTE:
CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. ENGINEER IS NOT RESPONSIBLE FOR PRECISE LOCATION OF EXISTING UNDERGROUND UTILITIES.

NOTE:
FOR ALL DETAILS AND SECTION SEE SHEET 2 & 3.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE & COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS & PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY & NOT TO BE LIMITED TO NORMAL WORKING HOURS & CONSTRUCTION CONTRACTOR AGREES TO DEFEND, INDEMNIFY & HOLD CO. OF SAN DIEGO & DESIGN PROFESSIONAL HARMLESS FROM ANY & ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

COUNTY APPROVED CHANGES

NO.	Description	Approved by	Date

BENCH MARK

DESCRIPTION: CHISELED SQUARE
LOCATION: AT THE TOP OF PEDRAMP ON S.E. CORNER OF SIERRA LINDA DRIVE AND VISTA BONITA
RECORD FROM: #425 CITY OF ESCONDIDO BENCHMARK BOOK
ELEVATION: 504.07 DATUM: MSL

RECORD PLAN

JOSHUA R. ZEIGLER DATE
R.C.E. No: 85413
EXPIRES: 9-30-18

PRIVATE CONTRACT

SHEET 4	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	16 SHEETS

GRADING PLAN FOR:
RESQUE RANCH
HIGHLAND VALLEY ROAD "VIOLATION"
CALIFORNIA COORDINATE INDEX 326-1767

APPROVED FOR:
WILLIAM P. MORGAN
COUNTY ENGINEER
BY: _____ DATE

ENGINEER OF WORK:
JOSHUA R. ZEIGLER R.C.E. NO. 85413 EXP. 9-30-20

GRADING PERMIT NO. PDS2016-LDGRMJ-30067

PLANS PREPARED BY:
SPEAR & ASSOCIATES, INC.
CIVIL ENGINEERING & LAND SURVEYING
475 PRODUCTION STREET, SAN MARCOS, CA 92078
PHONE (760) 736-2040 FAX (760) 736-4866
WWW.SPEARINC.NET

REGISTERED PROFESSIONAL ENGINEER JOSHUA R. ZEIGLER No. 85413 CIVIL STATE OF CALIFORNIA

ENGINEER'S NAME: SPEAR & ASSOCIATES, INC
PHONE NO. 1-760-736-2040

"NOT FOR CONSTRUCTION"

PLOT DATE: 11/27/2018 8:08 AM S:\Spear Projects\2014\14-160 PHIL PACE - HIGHLAND VALLEY RD, ESCONDIDO\CAD\14-160GP.dwg
SPEAR & ASSOCIATES PROJECT NO. 14-160 AJV

ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title: Hydrology And Hydraulics for RESQUE RANCH
Prepared By: Spear & Associates Inc.
Date: 4/6/18

This page was left intentionally blank.

ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

October 17, 2016 CTE Pr. No. 10-13288G

4030 Goldfinch Investments, LLC
Attention: Patricia Conners
3750 Sports Arena Blvd., Ste 6
San Diego, California 92110 Via Email: patti@Philsbbq.net

Subject: Percolation Testing and Calculated Infiltration Rates
ResQue Ranch
East of Paseo Penasco North of Highland Valley Road
County of San Diego, California

Ms. Conners:

Construction Testing and Engineering, Inc. (CTE) is pleased to provide 4030 Goldfinch Investments, LLC (Goldfinch) this geotechnical report providing percolation test results and associated calculated infiltration rates for the design phase of the ResQue Ranch that is located in rural terrain east of Paseo Penasco and north of Highland Valley Road in the County of San Diego, California. This report generally follows the County of San Diego storm water infiltration design requirements of February 2016. Authorization of this report was on August 22, 2016 via CTE proposal G-3868 dated August 22, 2016 by signature of Mr. Charles P. Pace as representative of Goldfinch. The proposed infiltration basin locations and associated depths are as provided by Spear and Associates, Inc. (Spear). CTE understands the project is in the design phase of development, and a site specific evaluation of the proposed infiltration basins is necessary as per Appendix C of the County of San Diego "Geotechnical and Groundwater Investigation Requirements" dated February 26, 2016.

Location of the site is shown on attached Figure 1, Site Index Map. Geotechnical information including soil boring locations and distribution of geologic units is shown on attached Figure 2, Geotechnical Map. Percolation and infiltration rates were evaluated in general accordance with the County of San Diego Storm Water Standards as referenced in Appendix A of this report.

1.0 GEOTECHNICAL CONDITIONS

1.1 General

The site is a graded lot utilized as a rescue facility for horses. It includes a barn, outlying pipe fence paddocks and large animal exercise areas. West facing slopes bound the east and west sides of the building pad, and north facing slopes bound the north side of the pad. South facing slopes bound the south margin of the site. Access to the site is afforded via an unpaved road on the north margin of

the site, and an asphalt paved road on the southwest property corner. In general, the site building pad is inclined down to the northwest corner at approximately a two percent surface gradient.

Two biofiltration basins are planned at the southwest corner of the site. One of the basins (Basin B) will be at the top of an approximately 20 feet high west facing slope. Another basin (Basin O) is planned to be southwest of Basin B, and is to be near the toe of an approximate fourteen feet high slope. Slopes at the retention basin locations are graded to a 2:1 (horizontal to vertical) surface ratio. Review of grading plans prepared by Spear indicates the bottom of the biofiltration basin amendments are to be approximately 3.25 feet below basin finish grade.

The biofiltration basins are to be filled with amendments to allow percolation and filtration of captured surface water. Impervious membranes are to line the sides of the basins. However, the bottom of the basins are to be unlined so as to allow infiltration of water into the underlying soils. A perforated collector pipe is planned to be approximately six inches above the underlying native soil at the bottom of the basin overcut.

1.2 Field Exploration

The field exploration consisted of advancing soil borings and percolation test holes within 50 feet of the two proposed infiltration basins. The soil borings extended at least 10 feet below the basin bottom(s) as designated by Spear, and percolation test holes were placed at depths to allow an evaluation of soils near the bottom of the infiltration basins. A total of two soil borings and three percolation test holes were placed on the subject site. Soil Boring B-3 was placed near Basin B and Boring B-4 was placed near Basin O. Two percolation tests were conducted within biofiltration Basin B footprint. One percolation test was conducted within the footprint of biofiltration Basin O. Logs for Boring 1 and Boring 2 are not attached with this report as these borings were placed outside of this basin infiltration evaluation. Both soil borings and percolation tests within Basin B were advanced by an eight inch diameter power advanced auger. The percolation test hole in Basin O was advanced by a six inch diameter hand auger. Soil borings and percolation test holes were placed on July 20, 2016. The percolation test holes were presoaked on July 20, 2016, and the subsequent percolation tests were performed on July 21, 2016.

Logs of the borings are provided in attached Appendix B. Location of the soil borings and percolation tests are shown on attached Figure 2, Geotechnical Map.

1.3 Soil Materials

Observations of site outcrops of native materials indicates the site is underlain by crystalline bedrock of the Cretaceous geologic age Mount Woodson granodiorite as mapped by Tan and Kennedy (1999). Grading of the site was performed between February 9, 2015 and April 7, 2015 (CTE, June 16, 2015). Fill was placed on the approximate west one half of the site to form the building pad and west facing slopes where the biofiltration basins are planned. The site is a balanced cut and fill property. As such, soil was not imported to the subject site. Soil Boring B-3 and Boring B-4 encountered residual soil of weathered Woodson Mountain granodiorite at depths of seven feet and

six feet, respecitively. Percolation Test Hole 3 within the toe of slope Basin O footprint encountered fill to a depth of three feet that was underlain by the Woodson Mountain granodiorite. .

1.4 Slope Stability

Reference to CTE report entitled "Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch, East of Paseo Penasco and North of Highland Valley Road, County of San Diego, California, APN 276-030-48 and APN 276-030-49" dated October 5, 2016 indicates the subject slope at the bioinfiltration basins possesses a calculated static safety factor in excess of 1.5. As such, the slope is considered to be "stable" with the biofiltration basins installed as planned.

1.5 Groundwater

Groundwater was not encountered in explorations advanced for this percolation testing/infiltration rate report. These explorations were within 50 feet of the proposed basins, and extended at least 10 feet below the planned basin bottoms as required by referenced guidance documents. In addition, surface seepage or springs were not observed at the time of the field explorations. Therefore, groundwater is generally not anticipated to adversely affect the proposed basins, provided surface drainage patterns are designed, constructed, and maintained as per the project civil engineer of record. However, minor perched or seepage water could develop variably at the site due to irrigation and/or precipitation in combination with variably shallow formational deposits underlying the site.

Septic systems were not encountered or observed during the site field investigation. All private septic systems should be placed no closer than allowed by the County of San Diego Department of Environmental Health.

Reference to Geotracker, an on line State of California source for contaminated sites under regulatory review, did not indicate that soil and/or groundwater contamination underlies or projects toward the site.

Current plans call for a perforated pipe to be installed within approximately six inches of the bottom of the filtration media. This perforated collector pipe is recommended to minimize potential mounding of water below the basin. Additionally, the perforated pipe is recommended for toe of slope Basin O to mitigate the potential for rising water at the bottom of the slope and down surface gradient properties.

1.6 Settlement and Volume Change

Settlement and volume change of soils underlying infiltration basins can limit the amount of infiltration of water in to those soils. Bioinfiltration Basin B is to be constructed in Quaternary previously placed fill. A one percent settlement of the fill soil once fully saturated is anticipated to occur. This minimal settlement is not anticipated to adversely impact the proposed design of Bioinfiltration Basin B.

1.7 Utility Considerations

Infiltration has the potential to damage subsurface utilities, and geotechnical hazards can result from the introduction of infiltrated water. Proposed utilities should be installed at an elevation no deeper than the bottom of the impermeable membrane planned to line the sides of the proposed basins. Proposed or existing utilities deeper than the impermeable membrane should be setback a minimum of 100 feet from proposed basin locations. This is to include proposed, onsite water features such as the "aqua tread pool". The bottom of the aqua "tread pool" should not extend lower than the elevation of the proposed basin bottoms should it be within 100 feet of the basins.

1.8 Retaining Walls and Foundations

Bioinfiltration Basin O is to be constructed at the base of an approximately 14 foot high slope. Retaining walls are planned to be constructed at the top and bottom of the slope to allow construction of Basin O. Infiltrating water from Bioinfiltration Basin B could potentially migrate southwest and compromise the footing of the proposed retaining wall on the up slope side of Basin O and infiltration from Basin O could compromise the foundation for the nearby toe of slope retaining wall. A subdrain should be installed at the approximate elevation of the top and toe of slope retaining wall footings, such that infiltrate does not mound behind the retaining walls.

Foundations of proposed structures within 100 feet of the proposed basins should not extend below the elevation of the bottom of the impermeable membrane to line the sides of the proposed basins.

1.9 Separation from Seasonal High Water

The subject site is underlain by crystalline granitic rock, which is a non-water bearing unit (Wolfenden,1989). As such, seasonably high water is not anticipated to impact the proposed bioinfiltration basins.

1.10 Wellhead Protection

Natural and man-made wellheads may be adversely affected by storm water infiltration through the introduction of contaminants. The San Diego County Department of Health does not list any wells within the vicinity of the subject site Assessor Parcel Number. As such, the proposed bioinfiltration basins are not anticipated to adversely affect any nearby wellheads.

1.11 Water Balance Impacts on Stream Flow

According to regional maps, "blue line" streams do not trend through the subject site. In addition, during site reconnaissance, active streams were not observed at or nearby the subject site. As such, the proposed bioinfiltration basins are not anticipated to adversely affect the natural water balance of regional streams or drainages.

2.0 PERCOLATION TESTS AND CALCULATED INFILTRATION RATES

2.1 Percolation Tests

Three percolation tests were performed in general accordance with Appendix D of the County of San Diego Storm Water Design requirements. Based on visual and tactile identification, the two percolation tests associated with Bioinfiltration Basin B were performed in Quaternary Previously Placed Fill that was medium dense to dense, silty fine to medium sand. Whereas, percolation test (P-3) associated with Bioinfiltration Basin O was performed in the Cretaceouos geologic age Woodson Mountain granodiorite that excavated as silty fine grained sand. The percolation tests were conducted at the approximate depth of the planned basin bottoms. The measured percolation rates were per the following Table 2.1.

TABLE 2.1
PERCOLATION RATES

Boring/Depth (inches)	Time	Time Change (minutes)	Initial Water Level (inches)	Final Water Level (inches)	Water Level Change (inches)	Percolation Rate	
						Inches/ Hour	Inches/ Minute
P-1/72”	0930	Initial	64	Initial	Initial		
	1000	30	64	65.25	1.25		
	1030	60	63.25	64.5	1.25		
	1100	90	64.5	65	0.5		
	1130	120	64	64.75	0.75		
	1200	150	64.75	65.25	0.5		
	1230	180	64	64.75	0.75		
	1300	210	64.75	65.375	0.625		
	1330	240	64.125	64.75	0.625	1.25	0.0208
Boring/Depth (inches)	Time	Time Change (minutes)	Water Level (inches)	Final Water Level (inches)	Water Level Change (inches)	Percolation Rate	
						Inches/ Hour	Inches/ Minute
P-2/72”	0932	Initial	64	Initial	Initial		
	1002	30	64	64.375	0.375		
	1032	60	64.375	65.75	1.375		
	1102	90	64	64.375	0.375		
	1132	120	64.375	64.75	0.375		
	1202	150	64.75	65.125	0.375		
	1232	180	64	64.5	0.5		
	1302	210	64.5	64.75	0.25		
	1332	240	64	64.5	0.5	0.75	0.0125
Boring/Depth (inches)	Time	Time Change (minutes)	Water Level (inches)	Final Water Level (inches)	Water Level Change (inches)	Percolation Rate	
						Inches/ Hour	Inches/ Minute
P-3/63	0934	Initial	55	Initial	Initial		
	1004	30	55	58.75	3.75		

	1034	60	52	58.625	6.625		
	1104	90	52	56.75	4.75		
	1134	120	52	55.75	3.75		
	1204	150	52	56.375	4.375		
	1234	180	51.25	55.375	4.125		
	1304	210	51.75	56	4.25		
	1334	240	55	58.75	3.75	8.000	0.1333

NOTES: Water Level as measured from the top of the hole.
The P-1 and P-2 borehole had an eight inch diameter and the P-3 borehole had a six inch diameter.
The percolation test holes were presoaked approximately 24 hours prior to the tests.
Weather was clear and warm during the percolation test.

As per the County of San Diego BMP design documents (February 2016) infiltration rates are to be evaluated through Porchet Method. CTE utilized the Porchet Method by reference to the County of Riverside (September 2011) guidelines. The intent of the infiltration rate is to take into account bias inherent in percolation test bore hole sidewall infiltration as would not occur at a basin bottom where such sidewalls are not present.

The infiltration rate (It) is derived by the equation:

It= {(change H 60 r) / [change t(r+2Hav)]}
Where:
Change t=time interval
Df=final depth to water
r=test hole radius
change t=60 minutes
Do=initial depth to water
Dt=total depth of test hole
Ho=Dt – Do is initial height of water at selected time interval
Hf=Dt-Df- is the final height of water at the selected time interval
Change H=is the change in height over the time interval
Hav=(Ho+Hf) / 2 is the average head height over the time interval

Given the measurement values of Table 2.1, the calculated infiltration rates without Safety Factor are as follows.

2.2 Biofiltration Basin B, Percolation Tests 1 and 2

Proposed Biofiltration Basin B is located west of the proposed aqua tread pool, on top of the westward facing fill slope. P-1 and P-2 are located within the footprint of the proposed basin and were excavated by an eight inch diameter power driven auger. The finished surface of the proposed

Biofiltration Basin B is at 983.5 feet above mean sea level (MSL). The proposed basin bottom is planned to extend 3.25 feet below the basin finished surface elevation. Percolation tests were conducted at the elevation of the proposed basin approximately five feet below existing grades. The calculated infiltration rates for Biofiltration Basin B are as follows.

Biofiltration Basin B, P-1

Given (units in inches)

Df=64.75
Do=64.125
Dt=72
r=4
change t=30 minutes

Calculated Infiltration Rate=0.261438 inches/hour

Biofiltration Basin B, P-2

Given (units in inches)

Df=64.5
Do=64
Dt=72
r=4
change t=30 minutes

Calculated Infiltration Rate=0.20513 inches/hour

The infiltration rates associated with Biofiltration Basin "B" are calculated without safety factor to be 0.2614379 inches/hour and 0.2051282 inches/hour at P-1 and P-2, respectively. Due to this variation, the lower value of P-2 should be conservatively assigned for basin design.

2.3 Biofiltration Basin O, Percolation Test 3

Proposed Biofiltration Basin O is located at the base of the fill slope adjacent to the property line within the southwest corner of the site. P-3 is located within the footprint of the proposed basin and was advanced by a six inch diameter hand auger. The finished surface of the proposed Biofiltration Basin O is at 977 feet above MSL. The proposed basin bottom is planned to extend 3.25 feet below the finished surface elevation. Percolation tests were conducted at the elevation of the proposed basin approximately six feet below existing grades. The calculated infiltration rates for Biofiltration Basin O are as follows.

Biofiltration Basin O, P-3

Given (units in inches)

Df=58.75
Do=55
Dt=63
r=3
change t=30 minutes

Calculated Infiltration Rate=1.47541 inches/hour

The infiltration rate associated with Biofiltration Basin O is calculated without safety factor to be 1.4754098 inches/hour at P-3. This value should be assigned for basin design.

3.0 WORKSHEETS

The County of San Diego Appendix C (January 2016) required Worksheets C.4.1 "Categorization of Infiltration Feasibility Condition" and D.5-1 "Factor of Safety and Design Infiltration Rate Worksheet" are attached in Appendix C. The percolation test at Biofiltration Basin O encountered fill soil and Woodson Mountain granodiorite as comparative to Biofiltration Basin B where the percolation test was conducted in fill soil. Due to dissimilar soil conditions, separate Worksheets D.5.1 are presented for Biofiltration Basin B and Biofilatration Basin O. The findings of these attachments and preceding Section 1 and Section 2 are considered in the following Section 4.0 "Recommended Calculated Infiltration Rates."

4.0 RECOMMENDED CALCULATED INFILTRATION RATES

A Minimum Safety Factor of 2 should be applied to Basin B and Basin O in accordance with attached Worksheet (s) D.5-1 "Factor of Safety and Design Infiltration Rate Worksheet" to calculate the infiltration values. The lowest of two uncorrected calculated infiltration rates from Basin B are utilized to provide CTE's recommended calculated infiltration rates as follows:

Biofiltration Basin B calculated infiltration is 0.10256 inches/hour
Biofiltration Basin C calculated infiltration is 0.73770 inches/hour

The project basin designer may increase the utilized safety factor through reference to attached Worksheet D.5-1 "Redundancy" and "Level of Pretreatment" as these topics are pertinent to their project scope.

4.0 CONCLUSIONS

Various conditions affect the feasibility of onsite retention basins. These conditions are discussed in the following.

1. Calculated infiltration rate with a minimum safety factor of 2 for Biofiltration B was 0.10256 inches per hour. Calculated infiltration rate with a minimum safety factor of 2 for Basin O was 0.73770 inches per hour. The variation in infiltration rates is due to variable soil types ranging from compacted fill in Biofiltration Basin B to weathered Woodson Mountain granodiorite at Biofiltration Basin O.

2. An impermeable liner along the sides and to the maximum depth of the filter medium is recommended as shown on current grading plans to reduce the potential for groundwater mounding and impacts to nearby utility excavations. Additionally, a perforated pipe near the bottom of the filtration medium is recommended as shown on current grading plans to reduce the potential adverse impacts of mounding water and rising water at the ground surface due to filtrate intrusion. The perforated pipe is recommended for Biofiltration Basin O to reduce the potential for rising water at the toe of slope and down surface gradient properties

3. Retaining walls necessary to provide a design for Biofiltration Basin 0 should be equipped with hell drains to collect subsurface water.

4. CTE is unaware of potential impacts of water rights on or near the property.

5. The potential for contamination of groundwater from infiltrating storm water is considered to be low for a properly designed basin that is provided adequate BMPs to control run off from asphalt paved parking and drive areas.

6. CTE should be present during construction of the proposed biofiltration basins.

5.0 CLOSING

This report is prepared in accordance with the ordinary standard of care utilized by reputable geotechnical consultants practicing in the San Diego region at this time. It makes no other representations express or implied. This report is not to be utilized for any other project or party not presented herein. This report has been prepared as per County of San Diego storm water control requirements. CTE does not accept any liabilities toward preparation of the County of San Diego required design requirements. It is noted that implementation of the information provided herein is subject to interpretation and approval of the County of San Diego who has adopted the subject storm water requirements as per the Regional Water Quality Control Board Region 9, " Model BMP Design Manual, San Diego Region" (2016). CTE does not accept the rationale of the subject County of San Diego storm water design requirements other than preparation of this report as required by the subject storm water design documents.

We appreciate the opportunity to be of service on this project. If you have any questions please contact this office.

Respectfully Submitted

CONSTRUCTION TESTING AND ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

Gregory F. Rzonca, CEG #1191
Certified Engineering Geologist

GFR/DTM/nri

Distribution: via email Dist: 4030 Goldfinch Investments, LLC/Patricia Conners: patti@philsbbq.net
Spear & Associates, Inc./Josh Ziegler: Josh@Spearinc.net
CGS3/Evelyn Heidelberg: eheidelberg@cgs3.com

Attachments:

Figure 1 Site Index Map
Figure 2 Geotechnical Map
Figure 2A Geologic Cross Section A-A'

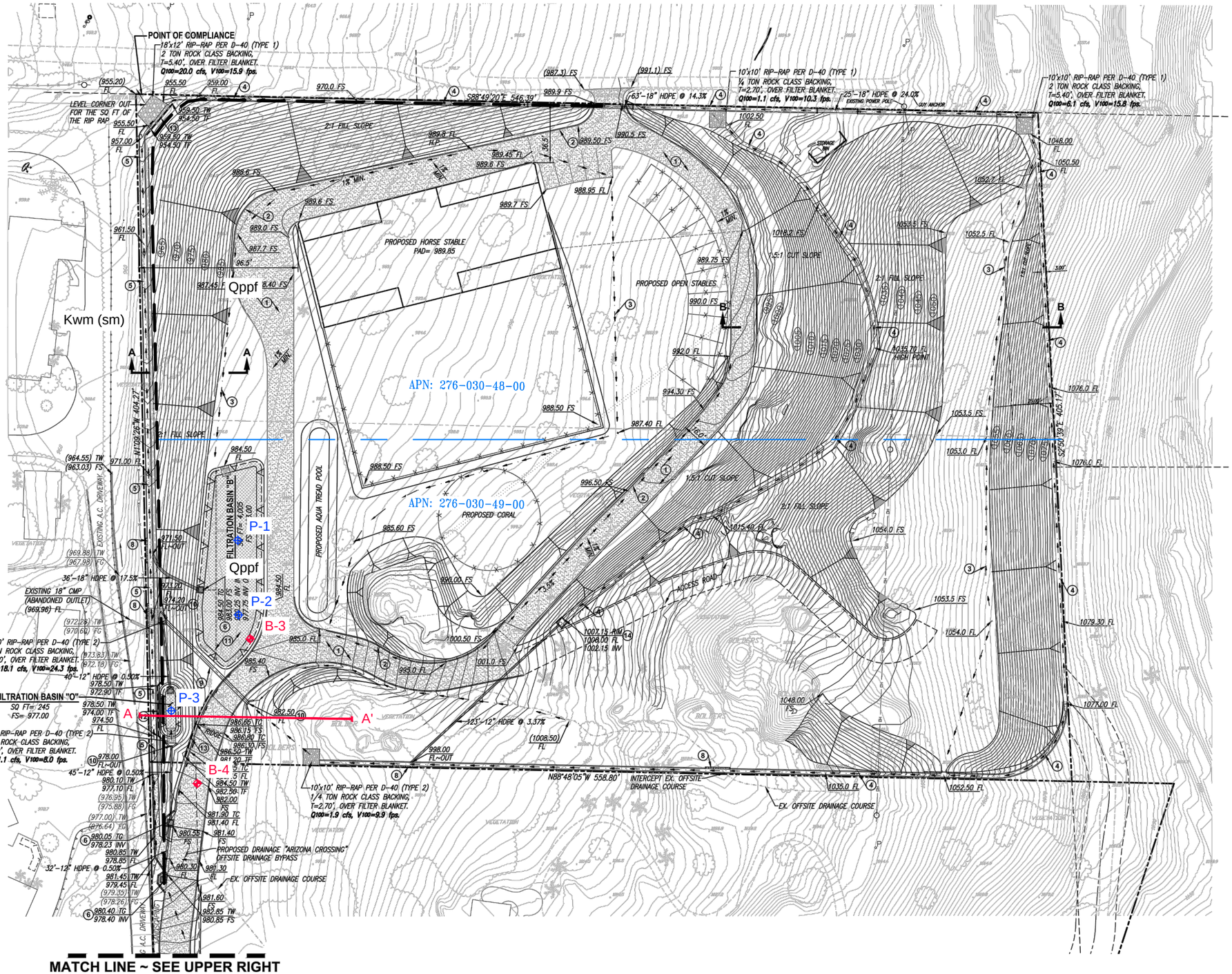
Appendix A References
Appendix B Boring Logs
Appendix C Worksheets

CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

SITE INDEX MAP

ResQue RANCH
APN: 276-030-48-00, APN: 276-030-49-00
NORTH OF HIGHLAND VALLEY ROAD, SAN DIEGO, CALIFORNIA

SCALE:	DATE:
AS SHOWN	10/16
CTE JOB NO.:	FIGURE:
10-13288G	1



LEGEND

- B-3 — APPROXIMATE BORING LOCATION
- P-3 — APPROXIMATE PERCOLATION TEST LOCATION
- Qppf — QUATERNARY PREVIOUSLY PLACED FILL
- Kwm (sm) — CRETACEOUS WOODSON MOUNTAIN GRANODIORITE
- APPROXIMATE GEOLOGIC CONTACT
- CROSS SECTION A-A'

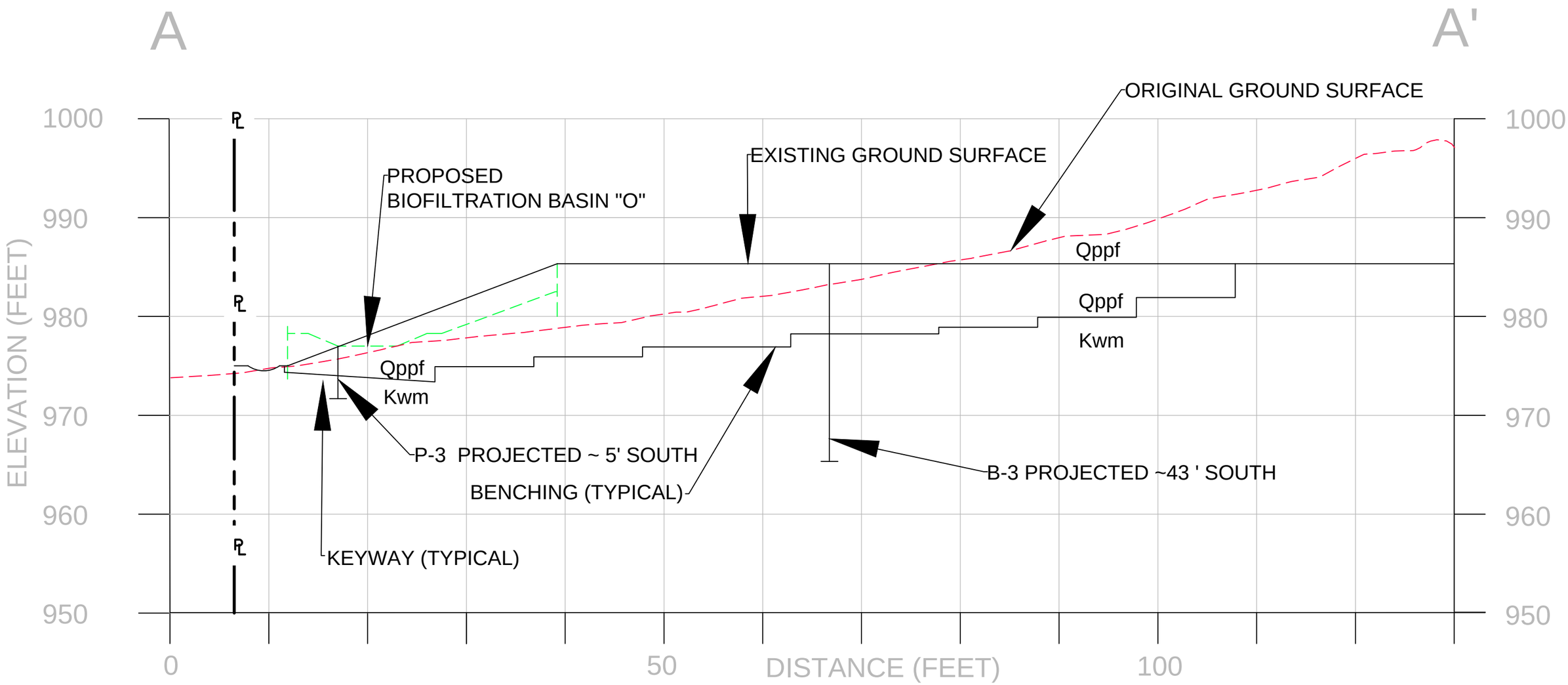
40' 0 20' 40'

CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

GEOTECHNICAL MAP

RESQUE RANCH
APN: 276-030-48-00, APN: 276-00-49-00
NORTH OF HIGHLAND VALLEY ROAD, SAN DIEGO, CALIFORNIA

CTE JOB NO:	10-13288G
SCALE:	1" ~ 40'
DATE: 10/16	FIGURE: 2



LEGEND

Qppf QUATERNARY PREVIOUSLY PLACED FILL

Kwm CRETACEOUS WOODSON MOUNTAIN GRANODIORITE

CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

GEOLOGIC CROSS SECTION A–A'

RESQUE RANCH

APN: 276-030-48-00, APN: 276-030-49-00

NORTH OF HIGHLAND VALLEY ROAD, SAN DIEGO, CALIFORNIA

CTE JOB NO:	10-13288G
SCALE:	1" = 10'
DATE: 10/16	FIGURE: 2A

APPENDIX A

REFERENCES

1. Construction Testing & Engineering, Inc., May 22, 2015, "Initial Preliminary Geotechnical Recommendations, Barn and Arena, APNs 276-030-48 and 276-030-49, County of San Diego, California," Project Number 10.12385G.

2. Construction Testing & Engineering, Inc., June 16, 2015, "Final Report of Testing of Compacted Fill, Barn and Arena, APN 276-030-48 and APN 276-030-49, County of San Diego, California," Project Number 10.12385G.

3. Construction Testing & Engineering, Inc., October 5, 2016, Geotechnical Slope Stability Evaluation, Manufactured Slope, Resque Ranch, East of Paseo Penasco and North of Highland Valley Road, County of San Diego, California, APN 276-030-48 and APN 276-030-49, " Project Number 10.13290G.

4. Regional Water Quality Control Board, Region 9 (prepared by various consultants on behalf of), February 2016, "Model BMP Design Manual, San Diego Region."

5. Riverside County of, Revised 9/2011, "Low Impact Development BMP Design Handbook" Appendix A-Infiltration Testing.

6. San Diego, County of, February 2016, "Storm Water Design Manual" (sections where geotechnical applicable).

7. Spear & Associates, Inc. undated, "Grading Plan For: Resque Ranch, Highland Valley Road "Violation" , four sheets.

8. Tan, S.S. and Kennedy, M.P., 1999, "Geologic Map of the Escondido 7.5' Quadrangle," California Division of Mines and Geology and United States Geological Survey.

9. Woolfenden, Linda R., 1989, "Geohydrology of the Escondido Hydrologic Subarea, San Diego County, California," United States Geological Survey, Water-Resources Investigations Report 88-4223.

APPENDIX B

BORING LOGS
BORINGS B-1, B-2 AND B-5 ARE NOT ATTACHED
THEY FOR ANOTHER RESQUE RANCH PROJECT

Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	**GRAVELS** MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS < 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES, LITTLE OF NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS < 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	**SILTS AND CLAYS** LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SLIGHTLY PLASTIC CLAYEY SILTS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTS OR LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTY CLAYS
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILTS AND CLAYS
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" 4 10 40 200

CLEAR SQUARE SIEVE OPENING U.S. STANDARD SIEVE SIZE

ADDITIONAL TESTS

(OTHER THAN TEST PIT AND BORING LOG COLUMN HEADINGS)

MAX- Maximum Dry Density
GS- Grain Size Distribution
SE- Sand Equivalent
EI- Expansion Index
CHM- Sulfate and Chloride Content , pH, Resistivity
COR - Corrosivity
SD- Sample Disturbed
PM- Permeability
SG- Specific Gravity
HA- Hydrometer Analysis
AL- Atterberg Limits
RV- R-Value
CN- Consolidation
CP- Collapse Potential
HC- Hydrocollapse
REM- Remolded
PP- Pocket Penetrometer
WA- Wash Analysis
DS- Direct Shear
UC- Unconfined Compression
MD- Moisture/Density
M- Moisture
SC- Swell Compression
OI- Organic Impurities

FIGURE: BL1

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PROJECT:	DRILLER:	SHEET: of
CTE JOB NO:	DRILL METHOD:	DRILLING DATE:
LOGGED BY:	SAMPLE METHOD:	ELEVATION:

Depth (Feet) | Sample: Bulk / Driven | Blows/Foot | Dry Density (pcf) | Moisture (%) | U.S.C.S. Symbol | Graphic Log

BORING LEGEND

DESCRIPTION

Laboratory Tests

0

Block or Chunk Sample

Bulk Sample

5

Standard Penetration Test

10

Modified Split-Barrel Drive Sampler (Cal Sampler)

Thin Walled Army Corp. of Engineers Sample

15

Groundwater Table

Soil Type or Classification Change

20

? — ? — ? — ? — ? — ? — ?

Formation Change [(Approximate boundaries queried (?)]

"SM"

Quotes are placed around classifications where the soils exist in situ as bedrock

25

FIGURE: BL2

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PROJECT:	RESQUE RANCH		DRILLER:	BAJA EXPLORATION	SHEET:	1	of 1
CTE JOB NO:	10-13288G		DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:		8/30/2016
LOGGED BY:	AJB		SAMPLE METHOD:	RING, SPT and BULK	ELEVATION:		~989 Feet

BORING: B-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SM		**QUATERNARY PREVIOUSLY PLACED FILL:** Medium dense to dense, moist, grayish brown, fine to coarse grained SAND.	
5						SM		**RESIDUAL SOIL:** Dense, moist, dark gray, silty fine grained SAND.	
10						"SM"		**CRETACEOUS WOODSON MOUNTAIN GRANODIORITE:** Very dense, slightly moist, reddish brown tonalite that excavates to silty fine grained SAND, highly weathered, oxidized.	
15								Becomes moderately weathered	
20								Total Depth: 20.0' No Groundwater Encountered Backfilled 8/30/2016	
25									

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PROJECT:	RESQUE RANCH	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-13288G	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	8/30/2016
LOGGED BY:	AJB	SAMPLE METHOD:	RING, SPT and BULK	ELEVATION:	~981 Feet

BORING: B-4

Depth (Feet)	Sample Bulk	Sample Driven	Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0							SM		**QUATERNARY PREVIOUSLY PLACED FILL:** Medium dense to dense, moist, grayish brown, fine to coarse grained SAND.	
5							SM		**RESIDUAL SOIL:** Dense, moist, dark reddish brown, silty fine to coarse grained SAND.	
10							"SM"		**CRETACEOUS WOODSON MOUNTAIN GRANODIORITE:** Very dense, slightly moist, reddish brown tonalite that excavates to silty fine grained SAND, moderately weathered, oxidized.	
15										
20									Total Depth: 16.0' (Refusal in Dense Tonalite) No Groundwater Encountered Backfilled 8/30/2016	
25										

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PROJECT:	RESQUE RANCH	DRILLER:	AJB	SHEET:	1 of 1
CTE JOB NO:	10-13288G	DRILL METHOD:	HAND AUGER	DRILLING DATE:	8/30/2016
LOGGED BY:	AJB	SAMPLE METHOD:	RING, SPT and BULK	ELEVATION:	~989 Feet

BORING: P-1

Depth (Feet)	Sample: Bulk	Sample: Driven	Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0							SM		**QUATERNARY PREVIOUSLY PLACED FILL:** Medium dense, dry to moist, grayish brown, silty fine to coarse grained SAND.	
5										
									Total Depth: 6.0' No Groundwater Encountered Backfilled 8/30/2016	
10										
15										
20										
25										

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PROJECT:	RESQUE RANCH	DRILLER:	AJB	SHEET:	1 of 1
CTE JOB NO:	10-13288G	DRILL METHOD:	HAND AUGER	DRILLING DATE:	8/30/2016
LOGGED BY:	AJB	SAMPLE METHOD:	RING, SPT and BULK	ELEVATION:	~989 Feet

BORING: P-2

Depth (Feet)	Sample: Bulk	Sample: Driven	Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0							SM		**QUATERNARY PREVIOUSLY PLACED FILL:** Medium dense, dry to moist, grayish brown, silty fine to coarse grained SAND.	
5										
									Total Depth: 6.0' No Groundwater Encountered Backfilled 8/30/2016	
10										
15										
20										
25										

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PROJECT:	RESQUE RANCH	DRILLER:	AJB	SHEET:	1 of 1
CTE JOB NO:	10-13288G	DRILL METHOD:	HAND AUGER	DRILLING DATE:	8/30/2016
LOGGED BY:	AJB	SAMPLE METHOD:	RING, SPT and BULK	ELEVATION:	~977 Feet

BORING: P-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/6"	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SM		**QUATERNARY PREVIOUSLY PLACED FILL:** Medium dense, dry to moist, grayish brown, silty fine to coarse grained SAND.	
						"SM"		**CRETACEOUS WOODSON MOUNTAIN GRANODIORITE:** Very dense, slightly moist, brownish gray tonalite that excavates to clayey fine to medium grained SAND, highly weathered, oxidized.	
5								Total Depth: 5.3' No Groundwater Encountered Backfilled 8/30/2016	
10									
15									
20									
25									

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