# County of San Diego
# PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

**Ramona Drive**
**PDS2016-TPM-21233**

**4342 Ramona Drive**
**Fallbrook, CA 92028**

**Assessor's Parcel Number(s):**
**123-310-55**

**ENGINEER OF WORK:**

**Kristin Greene, P.E. C57860, Exp. 6/30/2018**

PREPARED FOR:

Mike, Deborah and Troy Amos
P.O. Box 6241
Fallbrook, CA 92088


PDP SWQMP PREPARED BY:

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DATE OF SWQMP:
August 24, 2017

PLANS PREPARED BY:
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SWQMP APPROVED BY:
[FOR COUNTY STAFF ONLY]

APPROVAL DATE:

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## 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: Ramona Drive**
**Permit Application Number: PDS2016-TPM-21233**

### 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.

C57860, Exp. 6/30/2018
Engineer of Work's Signature, PE Number & Expiration Date

Kristin Greene, P.E.
Print Name

dk Greene Consulting, Inc.
Company

8.24.17
Date

Engineer's Seal:


SDC PDS RCVD 08-29-17
**TPM21233**

Template Date: February 26, 2016
LUEG:SW **PDP SWQMP**

Preparation Date: August 24, 2017

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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 | May 20, 2016 | Initial Submittal |
| 2 | September 28, 2016 | 2nd Submittal |
| 3 | February 20, 2017 | 3rd Submittal |
| 4 | March 15, 2017<br>August 24, 2017 | 4th Submittal<br>Final Submittal |

Final Design

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

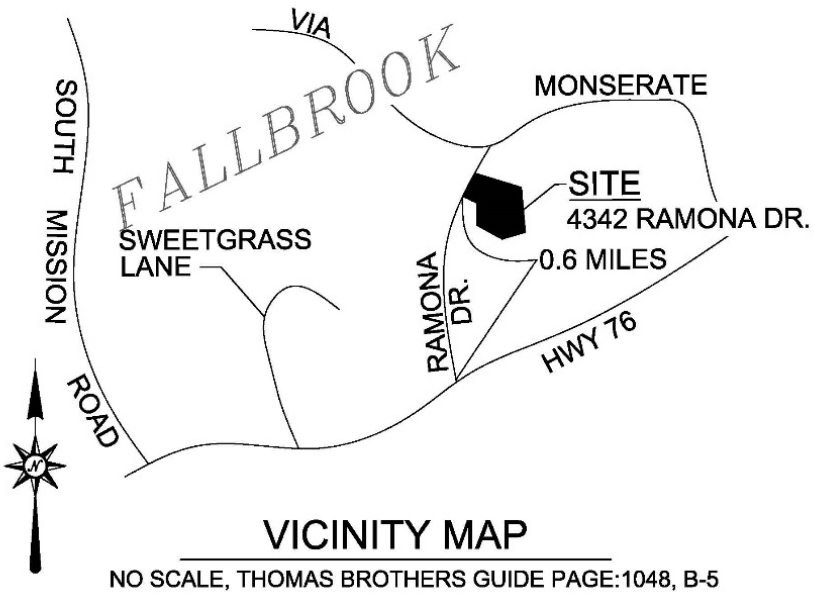
Plan Changes

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

## PROJECT VICINITY MAP

**Project Name: Ramona Drive**

**Record ID: PDS2016-TPM-21233**



## Step 1: Project type determination (Standard or Priority Development Project)

| | | | |
|---|---|---|---|
| Is the project part of another Priority Development Project (PDP)? ☐ Yes ☒ No<br>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: 17600 $ft^2$ | | | |
| The total existing (pre-project) impervious area is: 20547 $ft^2$ | | | |
| The total area disturbed by the project is: 47916 $ft^2$ | | | |
| 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.<br>WDID: pending | | | |
| 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:<br>(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).<br>(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.<br>(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.<br>(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, |

[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.

| | | | |
|---|---|---|---|
| | | | motorcycles, and other vehicles. |

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).<br>*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:<br>(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.<br>(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.<br>*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: 20547 $ft^2$ (A)
The total proposed newly created or replaced impervious area is 17600 $ft^2$ (B)
Percent impervious surface created or replaced (B/A)*100: 85.6 %
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**

## Step 1.1: Storm Water Quality Management Plan requirements

| Step | Answer | Progression |
|---|---|---|
| Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions?<br><br>To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below.<br>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.<br>**Complete Standard Project SWQMP.** |
| | ☒ PDP | Standard and PDP requirements apply, including PDP SWQMP.<br>**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.** |

## Step 1.2: Exemption to PDP definitions

| | |
|---|---|
| Is the project exempt from PDP definitions based on either of the following:<br><br>☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:<br>(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR<br>(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<br>(iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure; | If so:<br><br>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.* |
| ☐ 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:* | |

## Step 2: 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.<br><br>**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.)<br>**Reference Table 1 Items A, B, D, and E**<br>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?<br>**Reference Table 1 Items D and F** | ☐ Yes | ☒ No |
| 3. Will there be slurries from mortar mixing, coring, or concrete saw cutting?<br>**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?<br>**Reference Table 1 Items D and F** | ☒ Yes | ☐ No |
| 5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours?<br>**Reference Table 1 Items D and F** | ☒ Yes | ☐ No |
| 6. Will there be dewatering operations?<br>**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?<br>**Reference Table 1 Items E and F** | ☒ Yes | ☐ No |
| 8. Will trash or solid waste product be generated from this project?<br>**Reference Table 1 Item F** | ☒ Yes | ☐ No |
| 9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?)<br>**Reference Table 1 Item F** | ☒ Yes | ☐ No |
| 10. Will Portable Sanitary Services ("Porta-potty") be used on the site?<br>**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 | ☒ | Source Control and Site Design Map Sheet 1 |
| 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 | ☐ | Source Control and Site Design Map Sheet 1 |
| 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 | ☐ | No dewatering operations for this site. |
| **D. Select sediment control method for all disturbed areas (choose at least one)** | | | |
| Silt Fence | SC-1 | ☒ | Source Control and Site Design Map Sheet 1 |
| 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 | ☒ | Source Control and Site Design Map Sheet 1 |
| 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 | ☒ | Source Control and Site Design Map Sheet 1 |
| Spill Prevention and Control | WM-4 | ☒ | |
| **F.2 Waste Management[10]** | | | |
| Waste Management Concrete Waste Management | WM-8 | ☒ | Source Control and Site Design Map Sheet 1 |
| 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.

# Step 3: County of San Diego PDP SWQMP Site Information Checklist

## Step 3.1: Description of Existing Site Condition

| | |
|---|---|
| Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier) | 903.12, San Luis Rey HU, Lower San Luis HA, Bonsall HSA |

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 5.9 Acres ( 257004 Square Feet)
☐ Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)
☒ Impervious Areas 0.47 Acres ( 20547 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:*

## Step 3.2: 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:*

Topography of the site was provided by Sanlo and is dated June of 2015. The majority of the site is moderately sloping terrain to the west (toward Ramona drive) with an overall slope of approximately 21%. There are two natural drainage outlets, westerly toward Ramona Drive and a much smaller area that drains easterly. The high point of property is approximately 100 feet above Ramona Drive. This ridge creates two basins. Each of the two drainage basins will be divided into sub-basins area for this evaluation.

The majority of the property sheet flows to the west and outlets on to Ramona Drive. There are 6 points within Outfall 1 where the runoff exits the property to the West in the existing condition. The runoff then flows southerly toward the inlet pipe at the existing headwall. An unlined channel conveys the runoff to a pipe (headwall shown below) and under Ramona Drive.

There are two points where the runoff exits the property to the east (Outfall 2).

## Step 3.3: Description of Proposed Site Development

*Project Description / Proposed Land Use and/or Activities:*

This project proposes to create 2 additional lots (3 lots total) for the purpose of single family residential development.

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

The site will be developed with 2 single family homes and driveways.

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

Approximately 1.1 acres of the currently pervious 5.9 acres will be developed. Of the 1.1 acres, 0.4 acres will be impervious.

Approximately 4 acres will be left in a natural condition.

Does the project include grading and changes to site topography?

☒ Yes

☐ No

*Description / Additional Information:*

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 | 3.85 | 4 | 2% |
| Pervious (non-vegetated) | 2.05 | 1.5 | 9% |
| Impervious | 0.47 | 0.87 | 6% |

## Step 3.4: 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 property has been previously developed with three pad areas, divided into 8 different DMA's. All 8 DMA's manage storm water for both pollution control and flow control using Tree Well designed per fact sheet SD-A and guidelines in Appendix B of the manual. Brow ditches are used sparingly to prevent comingling of natural flows into the Tree Wells. The existing roadway, Ramona Drive, will remain and will not need to be widened or improved.**

## Step 3.5: 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 (provide description)

*Description / Additional Information:*

## Step 3.6: 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 storm water will exit the site in an unlined channel flowing to the San Luis Rey River and ultimately discharging into the Pacific Ocean near the City of Oceanside. There are no substantial underground conveyance systems.

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 |
|---|---|---|
| San Luis Rey River | Chloride, Enterococccus, Fecal Coliform, Phosphorus, Total Dissolved Solids, Total Nitrogen as N, Toxicity | Chloride, Enterococccus, Fecal Coliform, Phosphorus, Total Dissolved Solids, Total Nitrogen as N, Toxicity: All pollutants are listed as 5A |
| Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth | Enterococcus, Total Coliform | Enterococcus, Total Coliform: All pollutants are listed as 5A. |

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 | | | |
| Oxygen Demanding Substances | | | |
| Oil & Grease | | | |
| Bacteria & Viruses | | | |

[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

| | | | |
|---|---|---|---|
| Pesticides | | | |

## Step 3.7: 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):*

Hydromodification flow control has been achieved using Tree Wells sized to capture 2 times 85 percentile 24 hr storm depth which for this project is 1.4" of storm water runoff as advised by the County of San Diego Watershed Protection Program. Self-retaining areas designed to retain 2 times 85 percentile 24 hr storm depth which for this project is 1.4" of runoff have been determined to meet Hydromodification requirements. Refer to the BMP sizing Methodology for more information.

[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

### Step 3.7.1: Critical Coarse Sediment Yield Areas*

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

Projects must satisfy critical coarse sediment requirements by either avoiding impacts to onsite critical coarse sediment (Step A) AND bypassing upstream sources of critical coarse sediment (Step B), or by demonstrating the project has no net impact to the receiving water (Step C). Show the backup evidence of the following determinations in Attachment 2c. Refer to Appendix H of the BMP DM for more detailed critical coarse sediment guidance pertaining to identification, avoidance, bypass, and demonstration of no net impact.

**A: Avoid Onsite Critical Coarse Sediment**

Onsite sources of critical coarse sediment are protected through to the County's Resource Protection Ordinance. Applicants must characterize their project per one of the categories below and proceed as directed.

☒ Project is subject to and in compliance with RPO requirements

- Applicant must provide mapping of coarse sediment areas that are ≥25% slope and ≥50' in height as determined per the County of San Diego Resource Protection Ordinance. *(Note: these areas may be further refined per guidance in Section H.1.2 of the BMP DM)*

☐ Project is not subject to RPO requirements

- Applicant is not required to identify or avoid any onsite sources of coarse sediment.

☐ Project was initially subject to RPO requirements but qualified for an exemption per RPO Section 86.604(e)(2)(cc) or 86.604(e)(3)

- Applicant is not preserving sources of onsite critical coarse sediment and must demonstrate no net impact to the receiving water (Step C)

**B: Bypass Upstream and Onsite Critical Coarse Sediment**

All project applicants must identify sources of upstream critical coarse sediment from hillslopes and first order streams that drain through the project site. Hillslope sources must be identified as coarse sediment areas that are ≥25% slope, ≥50' in height, and draining through the project site *(Note: these areas may be further refined per guidance in Section H.1.2 of the BMP DM)*. First order streams are identified as field ditches, gullies, ephemeral gullies, and/or NHD streams. Additionally, the sources of onsite critical coarse sediment preserved in Step A must also be effectively bypassed.

☒ Project bypasses all sources of upstream and onsite critical coarse sediment

- Applicant has satisfied bypass requirements. **SEE ATTACHED SLOPE ANALYSIS**

☐ Project does not bypass all sources of upstream and onsite critical coarse sediment

- Applicant has not satisfied bypass requirements and must demonstrate the project has no net impact to the receiving water (Step C).

☐ Project does not have upstream and onsite sources of critical coarse sediment.

- Applicant has satisfied bypass requirements.

**C: Demonstrate No Net Impact**

Project applicants that do not satisfy all of the criteria above must achieve compliance by demonstrating the project has no net impact to the receiving water.

☒ N/A, project satisfies all criteria specified in Steps B and C.

- Applicant has satisfied all critical coarse sediment requirements

☐ Project did not satisfy all criteria from Step B and C.

- Applicant has not satisfied critical coarse sediment requirements and must demonstrate the project has no net impact to the receiving water per Appendix H.4

### Step 3.7.2: 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.*<br><br>N/A |
| Has a geomorphic assessment been performed for the receiving channel(s)?<br>☐ No, the low flow threshold is 0.1Q2 (default low flow threshold)<br>☐ Yes, the result is the low flow threshold is 0.1Q2<br>☐ Yes, the result is the low flow threshold is 0.3Q2<br>☐ Yes, the result is the low flow threshold is 0.5Q2<br><br>*If a geomorphic assessment has been performed, provide title, date, and preparer:*<br><br>*Discussion / Additional Information: (optional)* |

## Step 3.8: 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.*

Not applicable – no other requirement or constraints.

**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.*

N/A

## Step 4: 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:*<br>There will be no runoff into the MS4. | | | |
| **4.2.2** Storm Drain Stenciling or Signage | ☐ Yes | ☐ No | ☒ N/A |
| *Discussion / justification if 4.2.2 not implemented:*<br>There will be no storm drain on this site. | | | |
| **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:*<br>There will be no Outdoor Materials Storage Areas on this site. | | | |
| **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:*<br>There will be no Outdoor Work Areas on this site. | | | |

| 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:* | | | |
| **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.* | | | |

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

## Step 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:*<br>Not applicable to this project. | | | |
| **4.3.2** Conserve Natural Areas, Soils, and Vegetation | ☒ Yes | ☐ No | ☐ N/A |
| *Discussion / justification if 4.3.2 not implemented:* | | | |
| **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:*<br>Areas on the pad must be compacted to 95% in order to provide stability for the structures. | | | |
| **4.3.5** Impervious Area Dispersion | ☐ Yes | ☒ No | ☐ N/A |
| *Discussion / justification if 4.3.5 not implemented:*<br>Flat areas are not large enough to be acceptable for this BMP. | | | |

| Site Design Requirement | Applied | | |
|---|---|---|---|
| **4.3.6** Runoff Collection | ☒ Yes | ☐ No | ☐ N/A |
| *Discussion / justification if 4.3.6 not implemented:* | | | |
| **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:*<br>There is not enough area for water harvesting and no opportunity to reuse harvested water in the required 36 hours because of low toilet use. | | | |

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

## Step 6: 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).

### Step 6.1: 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.*

**Structural BMP's are not required and have not been implemented on this project.**

**The property has been previously developed with three pad areas, divided into 8 different DMA's. All 8 DMA's manage storm water for both pollution control and flow control using Tree Well designs per fact sheet SD-A and guidelines in Appendix B of the manual. Brow ditches are used sparingly to prevent comingling of natural flows into the Tree Wells. The existing roadway, Ramona Drive, will remain and will not need to be widened or improved.**

**Hydromodification flow control has been achieved using Tree Wells sized to capture 2 times 85 percentile 24 hr storm depth which for this project is 1.4" of storm water runoff as advised by the County of San Diego Watershed Protection Program. Self-retaining areas designed to retain 2 times 85 percentile 24 hr storm depth which for this project is 1.4" of runoff have been determined to meet Hydromodification requirements. Refer to the BMP sizing Methodology for more information.**

**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)*

## Step 6.2: Structural BMP Checklist

| **(Copy this page as needed to provide information for each individual proposed structural BMP)** | |
|---|---|
| Structural BMP ID No. | |
| Construction Plan Sheet No. - | |
| Type of structural BMP:<br>☐ Retention by harvest and use (HU-1)<br>☐ Retention by infiltration basin (INF-1)<br>☐ Retention by bioretention (INF-2)<br>☐ Retention by permeable pavement (INF-3)<br>☐ Partial retention by biofiltration with partial retention (PR-1)<br>☐ Biofiltration (BF-1)<br>☐ Biofiltration with Nutrient Sensitive Media Design (BF-2)<br>☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F<br>☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)<br>☐ 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)<br>☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)<br>☐ Detention pond or vault for hydromodification management<br>☐ Other (describe in discussion section below) | |
| Purpose:<br>☐ Pollutant control only<br>☐ Hydromodification control only<br>☐ Combined pollutant control and hydromodification control<br>☐ Pre-treatment/forebay for another structural BMP<br>☐ 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) | |
| 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. | |
| *Discussion (as needed):*<br><br>*(Continue on subsequent pages as necessary)* | |

Step 6.3: Offsite Alternative Compliance Participation Form

| PDP INFORMATION | |
|---|---|
| Record ID: | |
| Assessor's Parcel Number(s) [APN(s)] | |
| What are your PDP Pollutant Control Debits?<br>*See Attachment 1 of the PDP SWQMP | |
| What are your PDP HMP Debits? (if applicable)<br>*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?<br>*See Attachment 1 of the ACP SWQMP | |
| What are your ACP HMP Debits? (if applicable)<br>*See Attachment 2 of the ACP SWQMP | |
| | |
| Is your ACP in the same watershed as your PDP?<br>☐ Yes<br>☐ No | Will your ACP project be completed prior to the completion of the PDP?<br>☐ Yes<br>☐ No |
| Does your ACP account for all Deficits generated by the PDP?<br>☐ Yes<br>☐ 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?<br>*(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<br>-Worksheet B.1-1 (Required)<br>-Worksheet B.4-1 (if applicable)<br>-Worksheet B.4-2 (if applicable)<br>-Worksheet B.5-1 (if applicable)<br>-Worksheet B.5-2 (if applicable)<br>-Worksheet B.5-3 (if applicable)<br>-Worksheet B.6-1 (if applicable)<br>-Worksheet B.3-1 (optional)<br>-Summary Worksheet (optional) | ☑ Included:<br>-Worksheet B.3-1 (optional)<br>-Worksheet B.1-1 (Required)<br>-Summary Worksheet (optional) |
| Attachment 1b | Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)<br><br>Refer to Appendices C and D of the BMP Design Manual to complete Form I-8. | ☐ Included<br>☐ Not included because the entire project will use harvest and use BMPs<br><br>***Not required – Tree Wells*** |
| Attachment 1c | DMA Exhibit (Required)<br><br>See DMA Exhibit Checklist on the back of this Attachment cover sheet. | ☑ Included |
| Attachment 1d | Individual Structural BMP DMA Mapbook (Required)<br>-Place each map on 8.5”x11” paper.<br>-Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA. | ☐ Included |

## 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 | 5,172 | cubic-feet |
| | 1 | Proposed Development Type | Residential | unitless |
| | 2 | Number of Residents or Employees at Proposed Development | 2 | # |
| | 3 | Total Planted Area within Development | 0 | 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? | Yes | yes/no |
| | 7 | Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts? | Yes | yes/no |
| | 8 | Is Infiltration of Any Volume Anticipated to Produce Negative Impacts? | Yes | yes/no |
| Calculations | 9 | 36-Hour Toilet Use Per Resident or Employee | 1.86 | cubic-feet |
| | 10 | Subtotal: Anticipated 36 Hour Toilet Use | 4 | cubic-feet |
| | 11 | Anticipated 1 Acre Landscape Use Over 36 Hours | 52.14 | cubic-feet |
| | 12 | Subtotal: Anticipated Landscape Use Over 36 Hours | 0 | cubic-feet |
| | 13 | Total Anticipated Use Over 36 Hours | 4 | cubic-feet |
| | 14 | Total Anticipated Use / Design Capture Volume | 0.00 | 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? | No | yes/no |
| Result | 18 | Feasibility Category | 5 | 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 | DMA 1 | DMA 2 | DMA 3 | DMA 4 | DMA 5 | DMA 6 | DMA 7 | DMA 8 | | | unitless |
| | 1 | Basin Drains to the Following BMP Type | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | | | unitless |
| | 2 | 85th Percentile 24-hr Storm Depth | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | | | inches |
| | 3 | Design Infiltration Rate Recommended by Geotechnical Engineer | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | | | in/hr |
| | 4 | Impervious Surfaces Not Directed to Dispersion Area (C=0.90) | 1,414 | 2,405 | 4,122 | 2,003 | 1,868 | 1,703 | 2,121 | 12,182 | | | sq-ft |
| | 5 | Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30) | 8,935 | 8,174 | 3,795 | 2,901 | 4,264 | 4,603 | 4,827 | 4,964 | | | 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) | | | | | | | | | | | 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? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | 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 | 5 | 6 | 6 | 4 | 4 | 4 | 4 | 15 | | | # |
| | 20 | Average Mature Tree Canopy Diameter | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | | | 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 | 10,349 | 10,579 | 7,917 | 4,904 | 6,132 | 6,306 | 6,948 | 17,146 | 0 | 0 | sq-ft |
| | 29 | Initial Runoff Factor for Standard Drainage Areas | 0.38 | 0.44 | 0.61 | 0.55 | 0.48 | 0.46 | 0.48 | 0.73 | 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 | 0.38 | 0.44 | 0.61 | 0.55 | 0.48 | 0.46 | 0.48 | 0.73 | 0.00 | 0.00 | unitless |
| | 32 | Initial Design Capture Volume | 459 | 543 | 563 | 315 | 343 | 338 | 389 | 1,460 | 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 | 0.38 | 0.44 | 0.61 | 0.55 | 0.48 | 0.46 | 0.48 | 0.73 | n/a | n/a | unitless |
| | 38 | Design Capture Volume After Dispersion Techniques | 459 | 543 | 563 | 315 | 343 | 338 | 389 | 1,460 | 0 | 0 | cubic-feet |
| Tree & Barrel Adjustments | 39 | Total Tree Well Volume Reduction | 500 | 600 | 600 | 400 | 400 | 400 | 400 | 1,500 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | unitless |
| | 42 | Final Effective Tributary Area | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | sq-ft |
| | 43 | Initial Design Capture Volume Retained by Site Design Elements | 500 | 600 | 600 | 400 | 400 | 400 | 400 | 1,500 | 0 | 0 | cubic-feet |
| | 44 | Final Design Capture Volume Tributary to BMP | 0 | 0 | 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).

## 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 | DMA 1 | DMA 2 | DMA 3 | DMA 4 | DMA 5 | DMA 6 | DMA 7 | DMA 8 | - | - | unitless |
| | 1 | 85th Percentile Storm Depth | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | - | - | inches |
| | 2 | Design Infiltration Rate Recommended by Geotechnical Engineer | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | 0.080 | - | - | in/hr |
| | 3 | Total Tributary Area | 10,349 | 10,579 | 7,917 | 4,904 | 6,132 | 6,306 | 6,948 | 17,146 | - | - | sq-ft |
| | 4 | 85th Percentile Storm Volume (Rainfall Volume) | 1,207 | 1,234 | 924 | 572 | 715 | 736 | 811 | 2,000 | - | - | cubic-feet |
| Initial DCV | 5 | Initial Weighted Runoff Factor | 0.38 | 0.44 | 0.61 | 0.55 | 0.48 | 0.46 | 0.48 | 0.73 | - | - | unitless |
| | 6 | Initial Design Capture Volume | 459 | 543 | 563 | 315 | 343 | 338 | 389 | 1,460 | - | - | cubic-feet |
| Site Design Volume Reductions | 7 | Dispersion Area Reductions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | cubic-feet |
| | 8 | Tree Well and Rain Barrel Reductions | 500 | 600 | 600 | 400 | 400 | 400 | 400 | 1,500 | - | - | cubic-feet |
| BMP Volume Reductions | 9 | Effective Area Tributary to BMP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | square feet |
| | 10 | Final Design Capture Volume Tributary to BMP | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | cubic-feet |
| | 11 | Basin Drains to the Following BMP Type | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | - | - | unitless |
| | 12 | Volume Retained by BMP (normalized to 36 hour drawdown) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | cubic-feet |
| Total Volume Reductions | 13 | Total Fraction of Initial DCV Retained within DMA | 1.09 | 1.10 | 1.07 | 1.27 | 1.17 | 1.18 | 1.03 | 1.03 | - | - | fraction |
| | 14 | Percent of Average Annual Runoff Retention Provided | 82.8% | 83.1% | 82.3% | 87.4% | 84.9% | 85.2% | 81.2% | 81.2% | - | - | % |
| | 15 | Percent of Average Annual Runoff Retention Required | 9.2% | 9.2% | 9.2% | 9.2% | 9.2% | 9.2% | 9.2% | 9.2% | - | - | % |
| Performance Standard | 16 | Percent of Pollution Control Standard Satisfied | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | - | - | % |
| Treatment Train | 17 | Discharges to Secondary Treatment in Drainage Basin | - | - | - | - | - | - | - | - | - | - | unitless |
| | 18 | Impervious Surface Area Still Requiring Treatment | 0 | 0 | 0 | 0 | 0 | 0 | 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 | 0 | 0 | 0 | 0 | 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

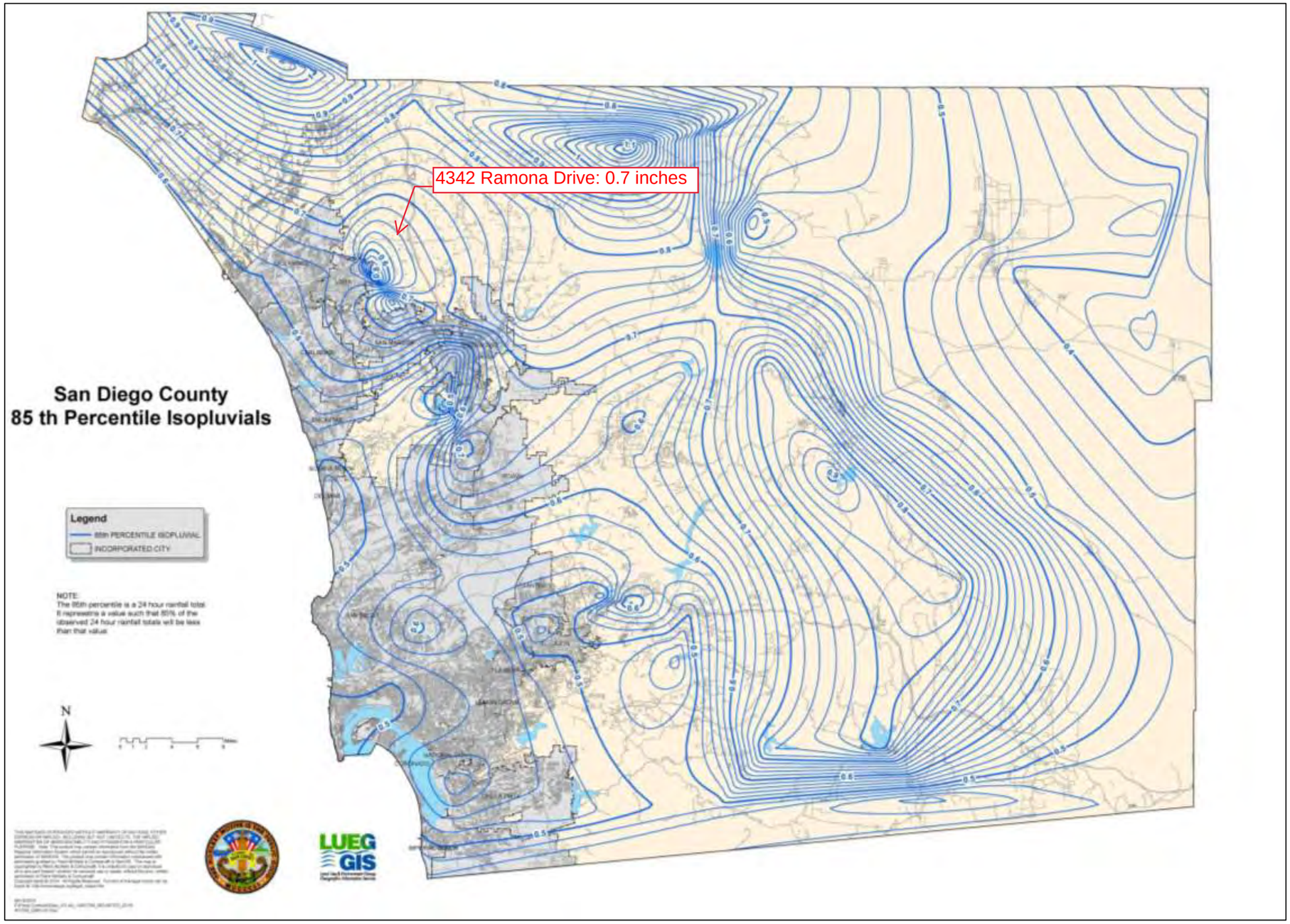



Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

P. O. Box 143, Bonsall, CA 92003

dk Greene Consulting, Inc.

Civil Engineering • Land Surveying • Water Resources
Licensed in California & Arizona

# Drawdown Calculations for:
# 15 feet diameter Street Trees

Minimum Soil Volume is 2 cubic feet per unit Canopy Area Projection

Mature Tree Canopy Diameter:
15 feet

$$Canopy\ Area\ Projection\ (A) = \pi r^2$$
$$Canopy\ diameter = 15\ ft$$
$$Canopy\ radius\ (r) = 7.5\ ft$$
$$A = \pi * 7.5^2 = 176.7\ ft^2$$

$$Minimum\ Soil\ Volume = 176.7\ ft^2 * 2\frac{ft^3}{ft^2} = 353.4\ ft^3$$

$$Soil\ Volume\ Depth\ (d) = {Min.\ Soil\ Vol.\ (\ ft^3)}\Big/{Tree\ Well\ Length\ (ft) * Tree\ Well\ Width\ (ft)}$$

$$Tree\ Well\ Length = 6\ feet$$
$$Tree\ Well\ Width = 9\ feet$$

$$d = {353.4\ ft^3}\Big/{6\ ft * 9\ ft} = 6.5\ ft$$

## $Drawdown\ Equation\ per\ B.4.1$

$$T\ (hrs) = \frac{(d * 12)}{I}$$

$$Infiltration\ Rate\ (I)\ of\ Amended\ Soil\ in\ Tree\ Well = 15\ {in}/{hr}$$

$$\frac{(6.5 * 12)}{15} = 5.2\ hrs$$

Kristin Greene • 760-310-9408 kristin@dkgreene.com

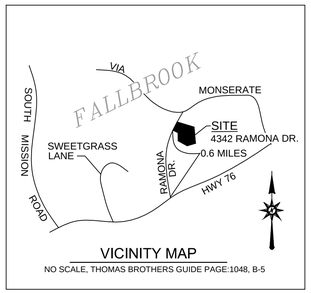
Dale Greene • 760-525-0264 dale@dkgreene.com

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

The DMA Exhibit must identify:

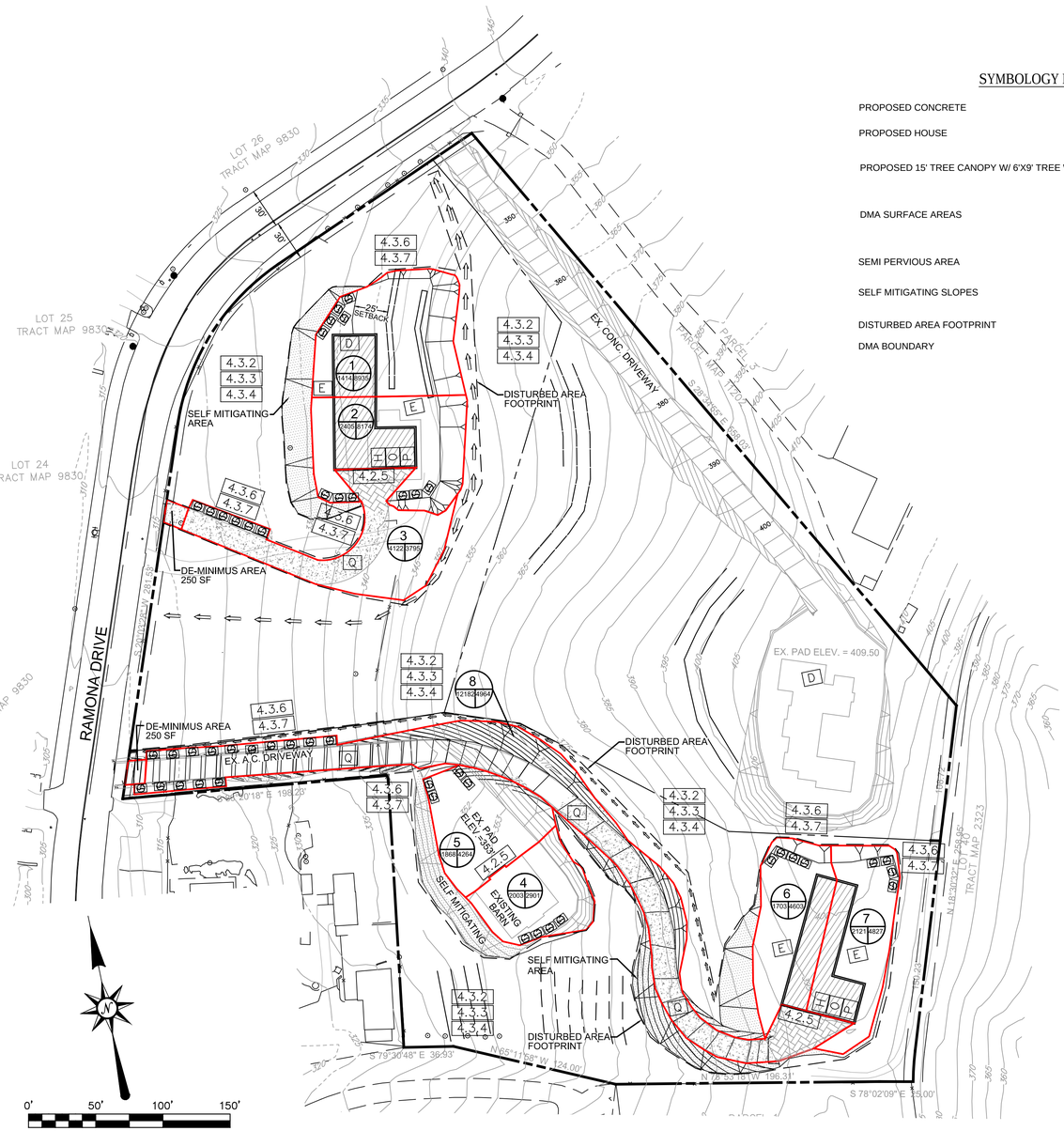
☑ Underlying hydrologic soil group
☑ Approximate depth to groundwater
☑ Existing natural hydrologic features ( watercourses, seeps, springs, wetlands)
☑ Critical coarse sediment yield areas to be protected
☑ Existing topography and impervious areas
☑ Existing and proposed site drainage network and connections 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)

# RESIDENTIAL DMA EXHIBIT




VICINITY MAP

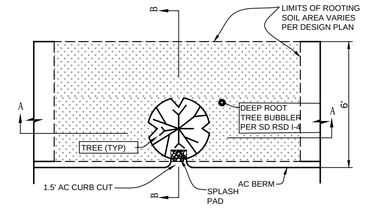
NO SCALE, THOMAS BROTHERS GUIDE PAGE:1048, B-5



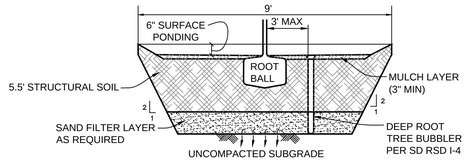

## SYMBOLOGY LEGEND

- PROPOSED CONCRETE
- PROPOSED HOUSE
- PROPOSED 15' TREE CANOPY W/ 6'X9' TREE WELL
- DMA SURFACE AREAS (1 / IMP. / SEMI PERV.)
- SEMI PERVIOUS AREA
- SELF MITIGATING SLOPES
- DISTURBED AREA FOOTPRINT
- DMA BOUNDARY

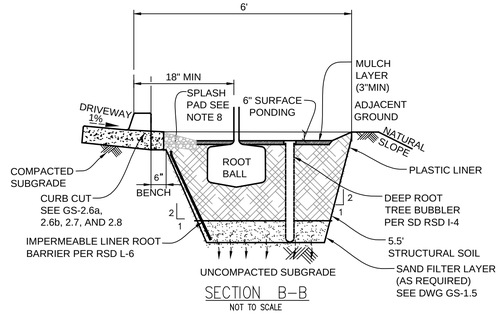
NOTES:
EXACT TREE WELL LOCATIONS TO BE ESTABLISHED DURING FINAL ENGINEERING (CONSTRUCTION) PHASE. ALL SETBACKS TO UTILITIES AND SEPTIC SYSTEMS MUST BE ADHERED TO.




PLAN VIEW
NOT TO SCALE




SECTION A–A
NOT TO SCALE




SECTION B–B
NOT TO SCALE

NOTES:
-THE UNDERLYING HYDROLOGIC SOILS GROUP IS C
-APPROXIMATE DEPTH TO GROUND WATER IS GREATER THAN 20'
-ALL CONSTRUCTION BMP'S SHOWN ON EROSION CONTROL PLAN PREPARED DURING FINAL ENGINEERING PHASE OF THIS PROJECT.
-THERE ARE NO CRITICAL COURSE SEDIMENT YIELD AREAS THAT NEED TO BE PROTECTED

POST–CONSTRCUTION SITE DESIGN BMPs

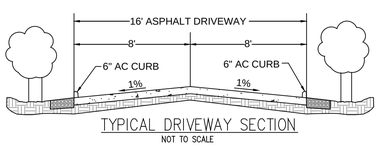
- 4.3.2 CONSERVE NATURAL AREAS, SOILS, AND VEGETATION
- 4.3.3 MINIMIZE IMPERVIOUS AREA
- 4.3.4 MINIMIZE SOIL COMPACTION
- 4.3.6 RUNOFF COLLECTION
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

POST CONSTRUCTION SOURCE CONTROL BMPs

- 4.2.5 PROTECT TRASH STORAGE AREAS
- 4.2.6 ADDNL BMPs BASED ON POTENTIAL RUNOFF POLLUTANTS:
  - D NEED FOR FUTURE INDOOR & STR. PEST CONTROL
  - E LANDSCAPE/OUTDOOR PESTICIDE USE
  - H TRASH OR REFUSE AREAS
  - O FIRE SPRINKLER TEST WATER
  - P MISCELLANEOUS DRAIN OR WASH WATER
  - Q PLAZAS, SIDEWALKS, DRIVEWAYS, AND PARKING LOTS

NOTES REGARDING SELF-MITIGATING AREAS:

- 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 PER SD-F.
- THE INCIDENTAL IMPERVIOUS AREAS ARE LESS THAN 5 PERCENT OF THE SELF-MITIGATING AREA.
- IMPERVIOUS AREA WITHIN THE SELF-MITIGATED AREA SHOULD NO 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 DMA'S THAT CONTAIN PERMANENT STORM WATER POLLUTANT CONTROL BMP'S.




TYPICAL DRIVEWAY SECTION
NOT TO SCALE


CIVIL ENGINEERING • LAND SURVEYING • WATER RESOURCES

dk Greene Consulting, Inc.

P.O. BOX 143
BONSALL, CA 92003
(760) 310–9408
EMAIL: KRISTIN@DKGREENE.COM


JOB NO. 15–37

PERMITS
TENTATIVE MAP NO.: TPM 21233
MAJOR USE PERMIT NO.:
SPECIAL USE PREMITNO.:

| NO. | COUNTY APPROVED CHANGES DESCRIPTION | APPROVED BY | DATE |
|---|---|---|---|
| | | | |

BENCH MARK
DESCRIPTION
LOCATION
RECORD FROM
ELEVATION DATUM

PRIVATE CONTRACT

| Sheet 1 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 1 Sheets |
|---|---|---|

RESIDENTIAL DMA EXHIBIT FOR:

4342 RAMONA DRIVE

CAL. COORD. INDEX:

Approved:
For County Engineer

ENGINEER OF WORK:
KRISTIN L. GREENE 57860 PE

ENGINEER'S NAME: dk Greene Consulting, Inc. PHONE NO.: (760) 310-9408

# 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)<br>See Chapter 6 and Appendix G of the BMP Design Manual | ☐ Included<br>☐ Submitted as separate stand-alone document<br>***Not required – Tree Wells*** |
| Attachment 2b | Hydromodification Management Exhibit (Required) | ☐ Included<br>***Not required – Tree Wells***<br>See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet. |
| Attachment 2c | Management of Critical Coarse Sediment Yield Areas<br><br>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,<br>☐ 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,<br>☐ 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)<br>See Section 6.3.4 of the BMP Design Manual. | ☒ Not performed<br>☐ Included<br>☐ Submitted as separate stand-alone document |
| Attachment 2e | Vector Control Plan (Required when structural BMPs will not drain in 96 hours) | ☐ Included<br>☒ Not required because BMPs will drain in less than 96 hours |

# MANAGEMENT CRITICAL COURSE
# SEDIMENT EXHIBIT

THE EXHIBIT DEPICTS THE GOOGLE EARTH MAP WITH PCCSYA_082514 LAYER FROM WMAA LOADED.

THIS SITE IS IMPACTED BY ANY ONSITE AND/OR UPSTREAM SOURCES OF CRITICAL COARSE SEDIMENT AS MAPPED BY WMAA.

1" = 100'

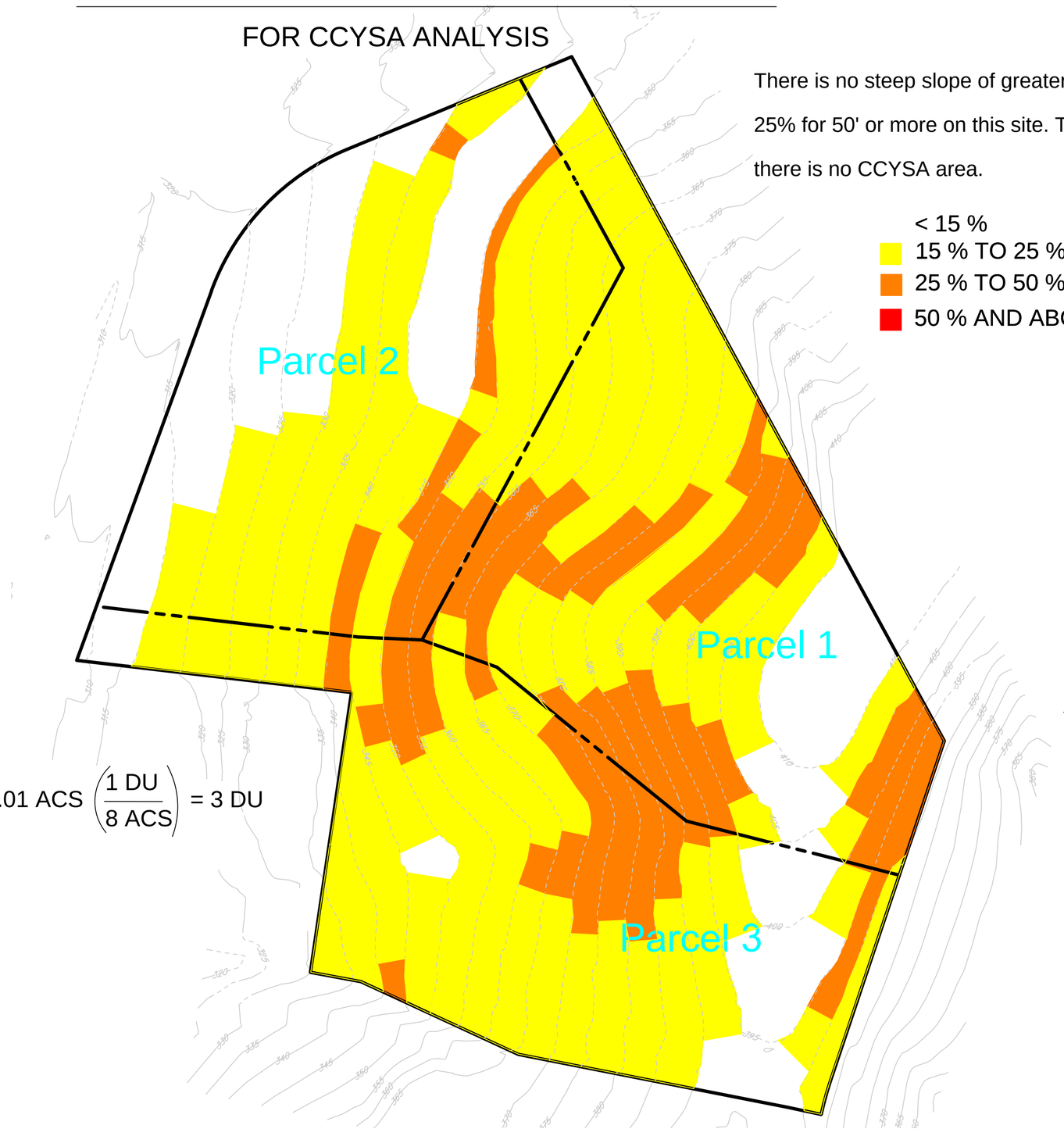
PREPARED BY:

dk Greene Consulting, Inc.
P.O.Box 143
Bonsall, CA 92003
(760) 310-9408

JOB NO. - 15-37

# SLOPE ANALYSIS MAP

FOR CCYSA ANALYSIS




There is no steep slope of greater than 25% for 50' or more on this site. Therefore there is no CCYSA area.

< 15 %
15 % TO 25 %
25 % TO 50 %
50 % AND ABOVE

0' 60 120 180

GRAPHIC SCALE: 1" = 60'

$$21.9\% = \frac{\text{Parcel 1 per aerial at 5' ci}}{\frac{\text{5' ci x 4,190 lf x 100}}{\text{2.20 x 43,560}}}$$

$$18.4\% = \frac{\text{Parcel 2 per aerial at 5' ci}}{\frac{\text{5' ci x 3,465 lf x 100}}{\text{2.16 x 43,560}}}$$

$$20.9\% = \frac{\text{Parcel 3 per aerial at 5' ci}}{\frac{\text{5' ci x 3,663 lf x 100}}{\text{2.01 x 43,560}}}$$

## DENSITY FORMULA

$$5.62\ \text{ACS}\left(\frac{1\ \text{DU}}{2\ \text{ACS}}\right) + 0.74\ \text{ACS}\left(\frac{1\ \text{DU}}{4\ \text{ACS}}\right) + 0.01\ \text{ACS}\left(\frac{1\ \text{DU}}{8\ \text{ACS}}\right) = 3\ \text{DU}$$

LICENSED LAND SURVEYOR
DALE A. GREENE
EXP. 6-30-16
LS 5755
STATE OF CALIFORNIA

Prepared by:

Dale A. Greene JANUARY 5, 2016

DALE A. GREENE DATE


dk Greene Consulting, Inc.
P.O. BOX 143
BONSALL, CA 92003
(760) 525-0264


*SLOPE ANALYSIS MAP*
*MIKE AMOS AND FAMILY*
P.O. BOX 624
FALLBROOK, CA 92088
(760) 801-1603

*PARCEL 4 OF PARCEL MAP 11202*
*County of San Diego, CA*
*Scale 1"=60' Date:1-05-2016*

dk Greene Consulting, Inc.

| Assessor's Parcel No. | Job No. | Drawing Name |
|---|---|---|
| 123-310-55 | JOB NO. 15-37 | 15-37 slope analysis.dwg |

**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)

# 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<br>***Not applicable – Tree Wells***<br>See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet. |
| Attachment 3b | Draft Stormwater Maintenance Notification / Agreement (when applicable) | ☐ Included<br>☐ 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.

# ATTACHMENT 4

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

This page was left intentionally blank.

| County of San Diego BMP Design Manual Verification Form | |
|---|---|
| **Project Summary Information** | |
| Project Name | |
| Record ID (e.g., grading/improvement plan number) | |
| Project Address | |
| Assessor's Parcel Number(s) (APN(s)) | |
| Project Watershed<br>(Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier) | |
| Maintenance Notification / Agreement No. | |
| **Responsible Party for Construction Phase** | |
| Developer's Name | |
| Address | |
| Email Address | |
| Phone Number | |
| Engineer of Work | |
| Engineer's Phone Number | |
| **Responsible Party for Ongoing Maintenance** | |
| Owner's Name(s)* | |
| Address | |
| Email Address | |
| Phone Number | |
| *Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout. | |

| County of San Diego BMP Design Manual Verification Form Page 2 of 4 | | | | | |
|---|---|---|---|---|---|
| **Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)** | | | | | |
| **Description/Type of Structural BMP** | **Plan Sheet #** | **STRUCT-URAL BMP ID#** | **Maint-enance Category** | **Maintenance Agreement Recorded Doc #** | **Revisions** |
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| *All Priority Development Projects (PDPs) require a Structural BMP | | | | | |

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

**County of San Diego BMP Design Manual Verification Form Page 3 of 4**

**Checklist for Applicant to submit to PDCI:**

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as- built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs 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 your name and seal.

[SEAL]

Professional Engineer's Printed Name:

Kristin Greene, P.E.

Professional Engineer's Signed Name:

Date:

**County of San Diego BMP Design Manual Verification Form Page 4 of 4**

**COUNTY - OFFICIAL USE ONLY:**

For PDCI: Verification Package #:_____

PDCI Inspector: _____

Date Project has/expects to close: _____

Date verification received from EOW: _____

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

PDCI Inspector's Signature:_____Date: _____

FOR WPP:

Date Received from PDCI: _____

WPP Submittal Reviewer:_____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

| List **acceptable** Structural BMPs: |
|---|
| |
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| |

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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# ATTACHMENT 6

## Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

# CEQA LEVEL DRAINAGE STUDY

Prepared for:

Mike, Deborah and Troy Amos
P.O. Box 624
Fallbrook, CA 92088

PROJECT:
PDS2016-TPM-21233
PDS2016-ER-16-02-001
**TPM 21233**
**3-lot Subdivision**
APN: 123-310-55

PREPARED BY:

dk Greene
Consulting, Inc.
P.O. Box 143
Bonsall, CA 92003

August 24, 2017

Prepared under the supervision of:

Kristin L. Greene, PE C57860 Date Exp. 6/30/18

CEQA LEVEL DRAINAGE STUDY
County of San Diego



**Appendices**

# 0.0 Declaration of Responsible Charge

I hereby declare that I am the Engineer-of-work for this project, that I have exercised responsible charge over the design of this project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as Engineer-of-work, of my responsibilities for project design.

8.24.17

Kristin L. Greene, PE C57860 Exp. 6/30/18 Date

# 1.0 Project Information

## 1.1 Introduction to Site and Project Description

The 6 acre site is located at 4342 Ramona Drive, in the Community of Fallbrook, in the unincorporated area of San Diego County. (See Figure 1.1). The site is currently developed with existing structures including, an existing single family home, an existing Agricultural Storage Building, and a shed. Existing driveways provide access to each of these buildings from Ramona Drive.

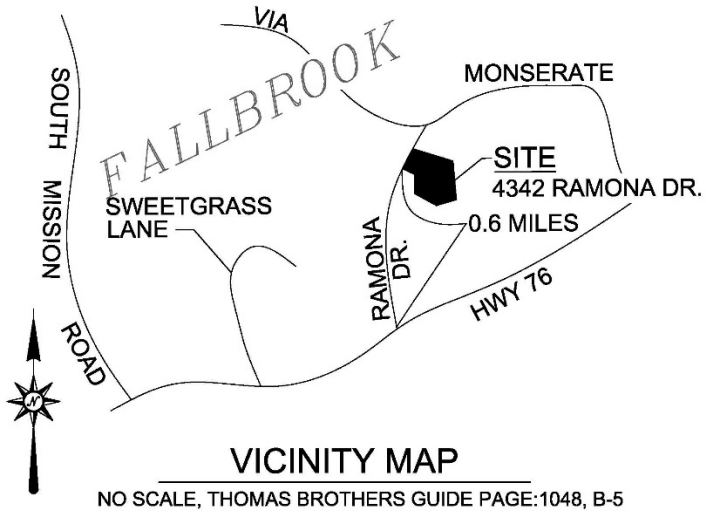



Figure 1.1.1

The owner intends to create 2 additional lot (3 lots total) for the purpose of single family residential development. The average lot size is 2 acre which is allowed by current zoning. Surrounding properties are similar in nature, developed residences on 2 acre or larger lots. The parcels on all sides are developed single family residential. There are no streams or rivers within the property. See aerial view below.

Figure 1.1.2 Aerial View

This report will focus on the Hydrology for the existing and post-development condition and the conceptual grading associated with the 3 graded lots. This report will evaluate the $Q_{100}$ for the existing condition and compare it to the $Q_{100}$ for the proposed condition by using the Modified Rational Method and County of San Diego's Hydrology Manual to evaluate peak flows.

## 1.2 Existing Site Topography and Drainage Condition

Topography of the site was provided by Sanlo and is dated June of 2015. The majority of the site is moderately sloping terrain to the west (toward Ramona Drive) with an overall slope of approximately 21%. There are two natural drainage outlets, westerly toward Ramona Drive, and a much smaller area that drains easterly. The high point of property is approximately 100 feet above Ramona Drive. This ridge create two basins. Each of the two drainage basins will be divided into sub-basins areas for this evaluation.

Parcel 1 has previously been developed with a single family home and driveway. No additional development is planned for Parcel 1.

Figure 1.2.1 From the south property line looking north

The majority of the property sheet flows to the west and outlets on to Ramona Drive. There are multiple locations within Outfall 1 where the runoff exits the property to the West in the existing condition. The runoff then flows southerly toward the inlet pipe at the existing headwall. An unlined channel conveys the runoff to a pipe (headwall shown below) and under Ramona Drive.

Figure 1.2.2 Ramona Drive at the Outlet Point – Outfall #1

There are two points where the runoff exits the property to the east (Outfall 2).

## 1.3 Proposed Topography and Drainage Condition

The proposed grading and drainage pattern will mimic the existing drainage condition and pattern. As discussed, the property has been previously developed with three pads areas The outlet Points will remain in their original locations and will outlet at a non-erosive velocity.

Each of the 3 lots, averaging approximately 2 acres, will maintain the existing drainage pattern. Grading for each of the new lots and driveways will amount to less than 2000 CY per lot on new Parcels 2 and 3. Creation of pads will allow for longer times of concentration ($T_c$) and therefore lower the Q for the drainage on the pads. The longer $T_c$ will help mitigate the increase flow created by the addition of the eventual improvements (residential homes and driveways).

The southerly portion of the project (Parcel 3) exits the lot at the historical outlet point which is the southwest corner of the property. Ramona Drive will continue to accept the majority of the drainage which flows to the existing pipe and headwall within the right-of-way, as shown in Figure 1.2.2.

All of these locations manage storm water for both pollution control and flow control using the Tree Well designs per fact sheets SD-A and guidelines in Appendix B of the BMP Design Manual. Brow ditches are used sparingly to prevent comingling of natural flows in the Tree Wells.

In order to mitigate the impervious surface created by the road and eventual homes and driveways, tree wells will be designed and placed to detain the hydromodification volume. The sizing of these tree wells is described in the Priority Development Project Storm Water Quality Management Plan.

The existing roadway, Ramona Drive, will remain and will <u>not</u> need to widened or improved.

# 2.0 Hydrology and Hydraulic Calculations

## 2.1 Method of Calculation

This Hydraulics and Hydrology Report was prepared using the following Manual:

Hydrology Manual, County of San Diego, 2003

The Rational Method was used to determine the 100 yr. Storm Q values.

The Rational Method uses the following formula to establish 100 year flow:

$$Q = C\ I\ A$$

where,

Q = the peak runoff in cubic feet per second

C = Runoff coefficient representing the ration of runoff to rainfall

I = time average intensity in inches per hour

A = Area of subbasin in acres

## 2.2 Soil Type, Imperviousness, Selection of "C"

A soils report has not been prepared for the site. According to the SCS Soil Survey for San Diego County, the soil type of this site is classified Hydrologic Soil Group "C". (See map in Appendix B.

The runoff coefficient "C" will be based on the Hydrologic Soil Group "C" for both the existing and proposed condition. The "C" for the existing conditions will be based on the 8% impervious condition ($C_{pre}$ = .35). The proposed condition "C" value will be based on 11%, which is appropriated for this project ($C_{post}$ = .37). See Appendices for Table 3-1.

## 2.3 Summary Table of Q Values

Calculations were conducted for this project and are provided in the spreadsheet table in Appendix B including C, Tc, I, A, $V_{100}$, $Q_{100}$. The following is a summary of the table with Appendix B.

| PRE VS. POST SUMMARY | | | |
|---|---|---|---|
| **Node** | **Pre Development Q100 (cfs)** | **Post Development Q100 (cfs) w/o mitigaion** | **Mitigated Q(100)** |
| **Outfall 1 – West to Ramona Drive** | **11.37** | **11.44** | **11.37** |
| **Outfall 2 - East** | **1.08** | **1.07** | **1.07** |

The difference between the pre and post condition is shown above. The difference is very small. However, a PDP SWQMP has been created for this property. The small increase will be mitigated by the proposed Tree Wells. Per the San Diego Hydraulic Design Manual, detention features, such as the tree well areas with 6" depths, reduce the Q(100) by the volume detained. The Trees Wells are designed to detain 2 times the 85$^{th}$ percentile Q. The mitigated Q above is shown less the Q(2) which conservatively approximates that flow. These mitigation measures will be sized and constructed during the final engineering phase or during the building permitting phase.

The majority of the runoff ultimately flows to Ramona Drive. There will be no flooding on offsite parcels due to the development of this project.

# 3.0 Report Summary

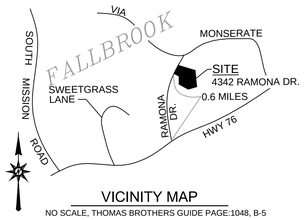
## 3.1 Recommendations

In my professional opinion, the proposed project will not substantially alter the existing drainage pattern of the area. The project has been designed to maintain the historical drainage pattern and to mitigate the increase in flow and velocity caused by the development of this project. The minor detention of flow needed to detain the small increase will be mitigated by the 6" ponding areas within the proposed tree wells. Due to these mitigation measures, there will be no increase in runoff to offsite parcels due to the development of this project. Due to the creation of pads on this moderately sloping terrain and the mitigation measures proposed by the PDP SWQMP, this proposed project will not increase the runoff, nor create or contribute runoff water which will exceed the capacity of the existing or planned storm water drainage system. There is no flooding risk associated with this project, and none of the boundary and therefore no structures are within a 100-year flood hazard area.

# Appendices

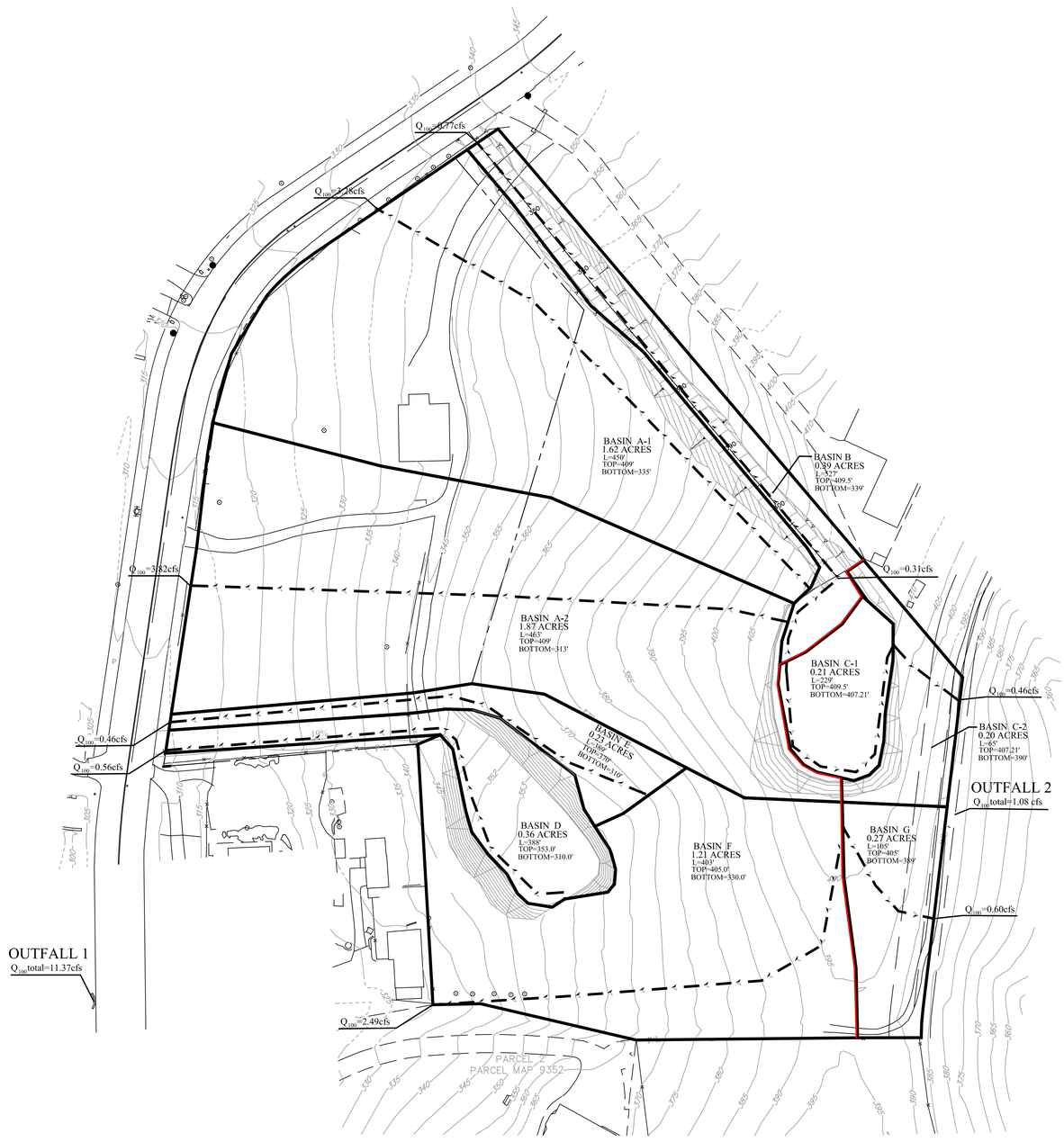
# Appendix A

# EXISTING HYDROLOGY MAP



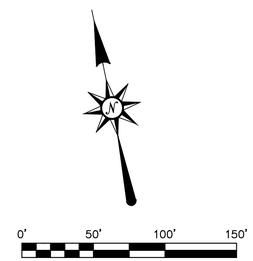

VICINITY MAP

NO SCALE, THOMAS BROTHERS GUIDE PAGE:1048, B-5




DRAINAGE LEGEND

| | |
|---|---|
| DRAINAGE PATH | |
| BASIN DELINEATION | |
| OUTFALL 1 FLOW LENGTH | L=215 |
| OUTFALL BOUNDARY | |




Prepared By:

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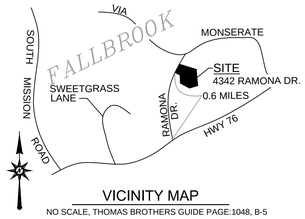
Tele: (760) 310-9408
EMAIL: KRISTIN@DKGREENE.COM

JOB NO. 15-37

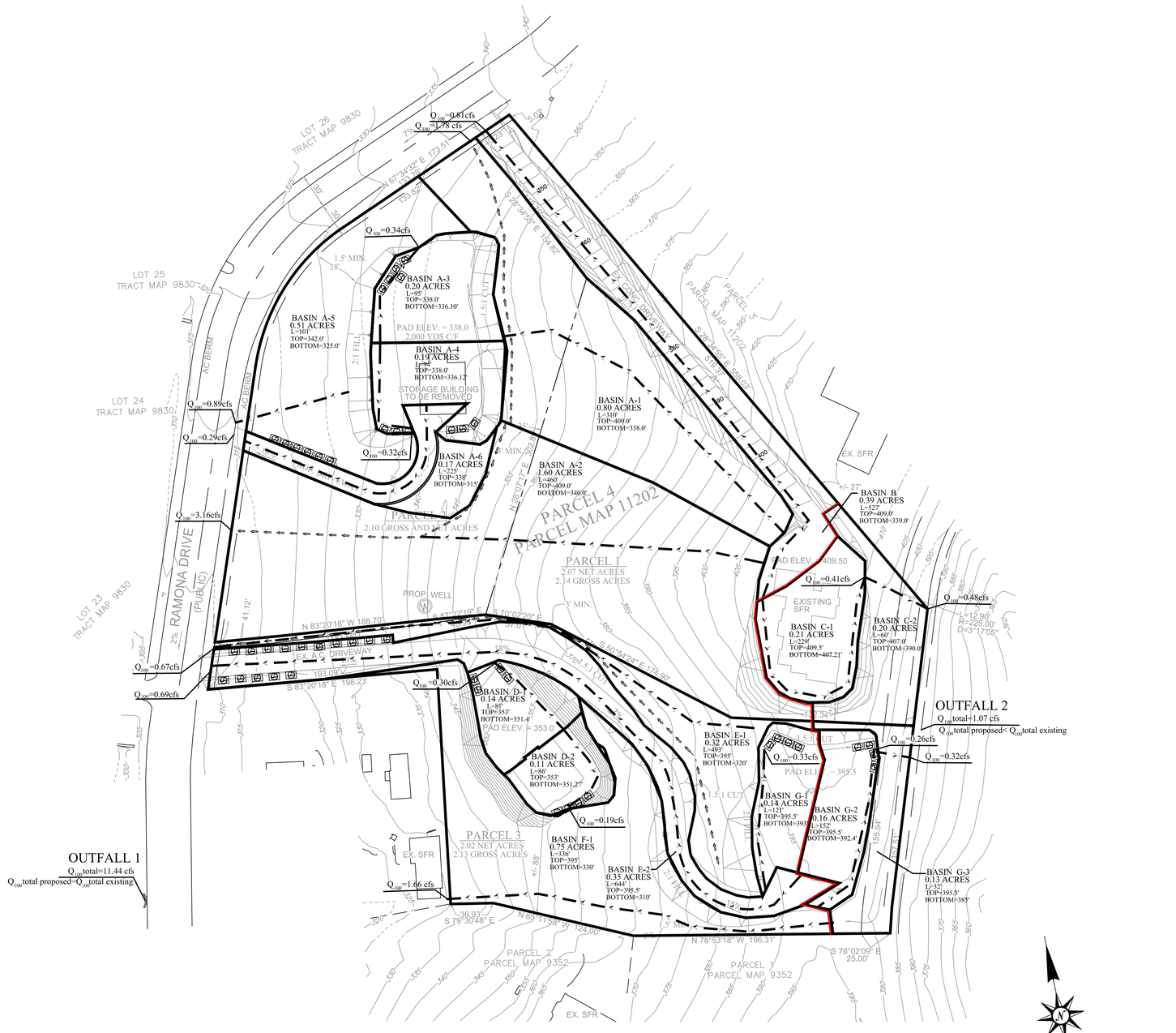
EXISTING HYDROLOGY MAP

# PROPOSED HYDROLOGY MAP



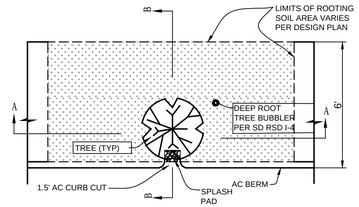

VICINITY MAP

NO SCALE, THOMAS BROTHERS GUIDE PAGE:1048, B-5



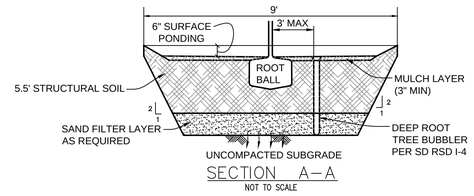

## DRAINAGE LEGEND

| | |
|---|---|
| DRAINAGE PATH | |
| BASIN DELINEATION | |
| OUTFALL 1 FLOW LENGTH | L=215 |
| BROW DITCH | |
| OUTFALL BOUNDARY | |
| 15' CANOPY TREE W/ 9'X6' TREE WELL | |



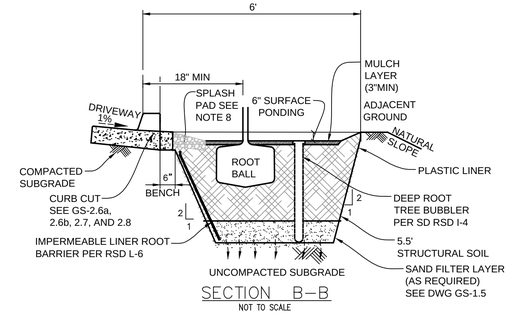

PLAN VIEW

NOT TO SCALE




SECTION A–A

NOT TO SCALE




SECTION B–B

NOT TO SCALE

0' 50' 100' 150'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PROPOSED HYDROLOGY MAP

JOB NO. 15-37

# Appendix B

**PRE DEVELOPMENT CONDITION SUMMARY**

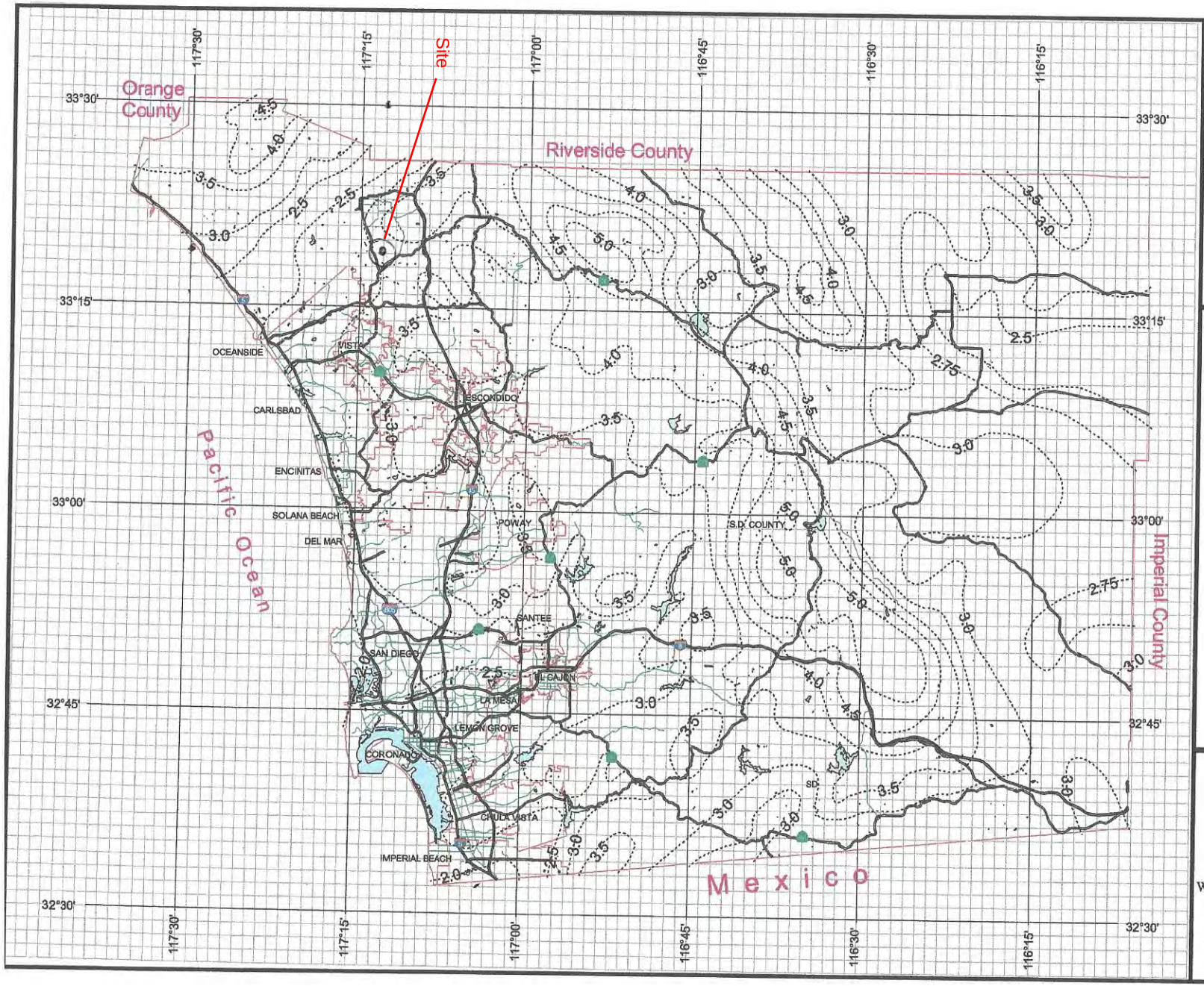
| SYSTEM | AREA (AC) | C | U/S ELEVATION (FT) | D/S ELEVATION (FT) | LENGTH (FT) | SLOPE (%) | $P_6$ (IN) | Ti from tab. 3-2 | $T_C$ (MIN) 3-4 | SUM OF $T_C$ (MIN) | I (IN/HR) | Q100 (CFS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Outfall 1** | | | | | | | | | | | | |
| **Basin A-1** | 1.62 | 0.35 | 409.0 | 335.0 | 450 | 16.4 | **3.0** | 6.4 | **1.7** | 8.1 | 5.8 | 3.28 |
| **Basin A-2** | 1.87 | 0.35 | 409.0 | 313.0 | 463 | 20.7 | **3.0** | 6.4 | **1.6** | 8.0 | 5.8 | 3.82 |
| **Basin B** | 0.39 | 0.35 | 409.5 | 339.0 | 527 | 13.4 | **3.0** | 6.4 | **2.1** | 8.5 | 5.6 | 0.77 |
| **Basin D** | 0.36 | 0.35 | 353.0 | 310.0 | 388 | 11.1 | **3.0** | 10.5 | **1.8** | 12.3 | 4.4 | 0.56 |
| **Basin E** | 0.23 | 0.35 | 405.0 | 365.0 | 389 | 10.3 | **3.0** | 6.4 | **1.9** | 8.3 | 5.7 | 0.46 |
| **Basin F** | 1.21 | 0.35 | 405.0 | 330.0 | 403 | 18.6 | **3.0** | 6.4 | **1.5** | 7.9 | 5.9 | 2.49 |
| | | | | | | | | | | **Outfall 1** | | **11.37** |
| **Outfall 2** | | | | | | | | | | | | |
| **Basin C-1** | 0.21 | 0.35 | 409.5 | 407.2 | 229 | 1.0 | **3.0** | 10.5 | **3.0** | 13.5 | 4.2 | 0.31 |
| **Basin C-2** | 0.20 | 0.35 | 407.0 | 390.0 | 60 | 28.3 | **3.0** | 6.4 | **0.3** | 6.7 | 6.5 | 0.46 |
| **Basin G** | 0.27 | 0.35 | 405.0 | 390.0 | 105 | 14.3 | **3.0** | 6.4 | **0.6** | 7.0 | 6.4 | 0.60 |
| | 6.36 | | | | | | | | | **Outfall 2** | | **1.06** |

**POST DEVELOPMENT CONDITION SUMMARY**

| SYSTEM | AREA (AC) | C | U/S ELEVATION (FT) | D/S ELEVATION (FT) | LENGTH (FT) | SLOPE (%) | $P_6$ (IN) | Ti from tab. 3-2 | $T_C$ (MIN) 3-4 | SUM OF $T_C$ (MIN) | I (IN/HR) | Q100 (CFS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Outfall 1** | | | | | | | | | | | | |
| **Basin A-1** | 0.80 | 0.37 | 409.0 | 348.0 | 310 | 19.7 | **3.0** | 6.4 | **1.2** | 7.6 | 6.0 | 1.78 |
| **Basin A-2** | 1.60 | 0.37 | 338.0 | 315.0 | 460 | 5.0 | **3.0** | 6.4 | **2.8** | 9.2 | 5.3 | 3.16 |
| **Basin A-3** | 0.20 | 0.37 | 338.0 | 336.0 | 95 | 2.1 | **3.0** | 10.5 | **1.2** | 11.7 | 4.6 | 0.34 |
| **Basin A-4** | 0.19 | 0.37 | 338.0 | 336.0 | 94 | 2.1 | **3.0** | 10.5 | **1.1** | 11.6 | 4.6 | 0.32 |
| **Basin A-5** | 0.51 | 0.37 | 342.0 | 325.0 | 101 | 16.8 | **3.0** | 10.5 | **0.5** | 11.0 | 4.7 | 0.89 |
| **Basin A-6** | 0.17 | 0.37 | 338.0 | 315.0 | 225 | 10.2 | **3.0** | 10.5 | **1.2** | 11.7 | 4.6 | 0.29 |
| **Basin B** | 0.39 | 0.37 | 409.0 | 339.0 | 527 | 13.3 | **3.0** | 6.4 | **2.1** | 8.5 | 5.6 | 0.81 |
| **Basin D-1** | 0.14 | 0.37 | 395.0 | 327.0 | 81 | 16.0 | **3.0** | 10.5 | **1.7** | 8.1 | 5.8 | 0.30 |
| **Basin D-2** | 0.11 | 0.37 | 353.0 | 351.3 | 86 | 2.0 | **3.0** | 10.5 | **1.1** | 11.6 | 4.6 | 0.19 |
| **Basin E-1** | 0.32 | 0.37 | 395.5 | 320.0 | 493 | 15.3 | **3.0** | 6.4 | **1.9** | 8.3 | 5.7 | 0.67 |
| **Basin E-2** | 0.35 | 0.37 | 395.0 | 330.0 | 644 | 10.1 | **3.0** | 6.4 | **2.7** | 9.1 | 5.4 | 0.69 |
| **Basin F-1** | 0.75 | 0.37 | 395.0 | 330.0 | 336 | 19.3 | **3.0** | 6.4 | **1.3** | 7.7 | 6.0 | 1.66 |
| **Basin G-1** | 0.14 | 0.37 | 407.0 | 390.0 | 121 | 14.0 | **3.0** | 6.4 | **0.7** | 7.1 | 6.3 | 0.33 |
| | | | | | | | To RAMONA DRIVE | | | **Outfall 1** | | **11.44** |
| **Outfall 2** | | | | | | | | | | | | |
| **Basin C-1** | 0.21 | 0.37 | 409.5 | 407.2 | 229 | 1.0 | **3.0** | 6.4 | **3.0** | 9.4 | 5.3 | 0.41 |
| **Basin C-2** | 0.20 | 0.37 | 407.0 | 390.0 | 60 | 28.3 | **3.0** | 6.4 | **0.3** | 6.7 | 6.5 | 0.48 |
| **Basin G-2** | 0.16 | 0.37 | 395.5 | 392.4 | 152 | 2.0 | **3.0** | 10.5 | **1.7** | 12.2 | 4.5 | 0.26 |
| **Basin G-3** | 0.13 | 0.37 | 395.5 | 385.0 | 32 | 32.8 | **3.0** | 6.4 | **0.2** | 6.6 | 6.6 | 0.32 |
| | 6.37 | | | | | | | To the West | | **Outfall 2** | | **1.07** |

XHT

15.37




# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 6 Hours**

Isopluvial (inches)

Lat. 33° 19'

Long. 117° 13'

$P_6 = 3.0$

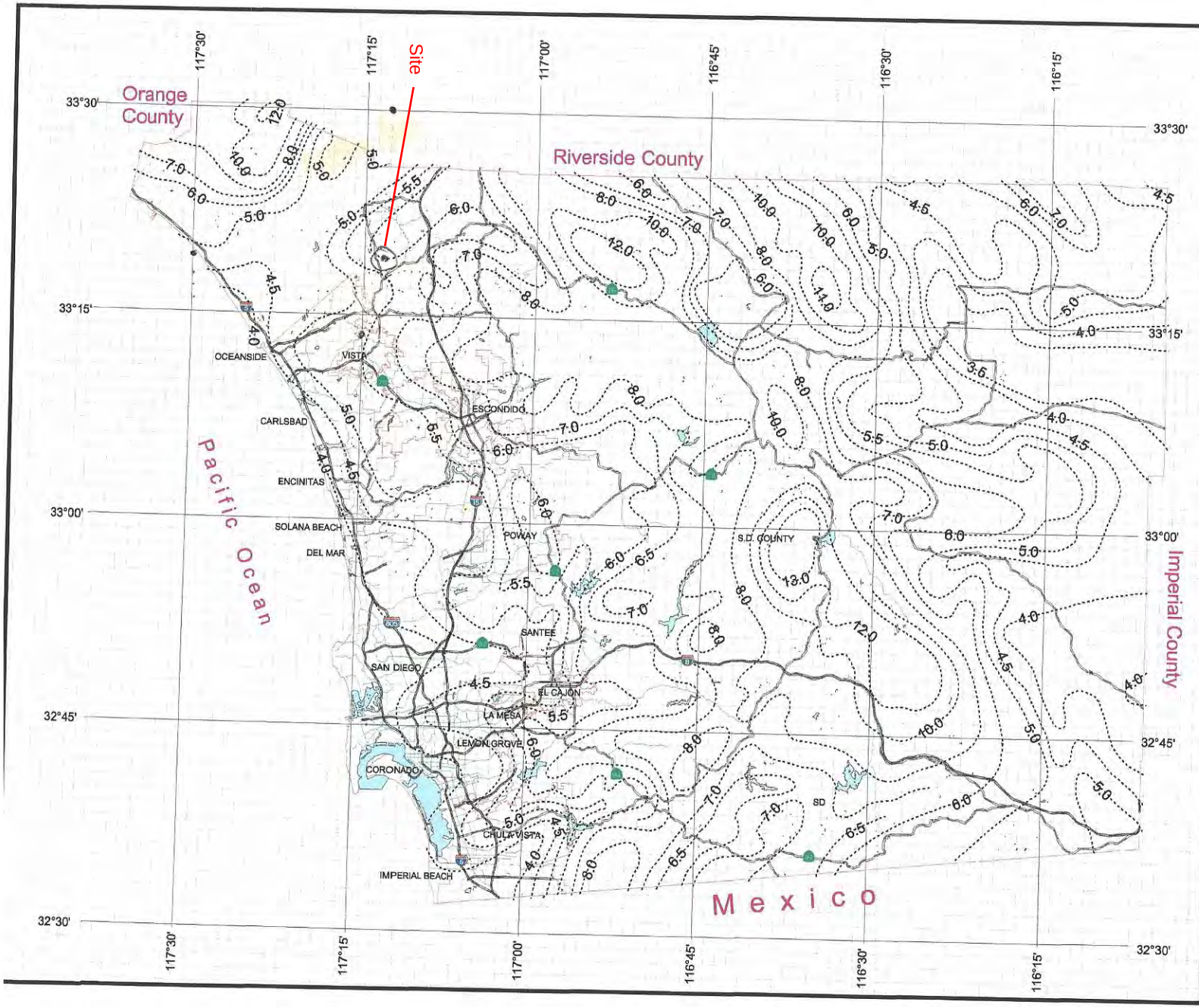
DPW GIS
Department of Public Works Geographic Information Services

SanGIS
We Have San Diego Covered!



N W E S

3 0 3 Miles




# County of San Diego Hydrology Manual

*Rainfall Isopluvials*

**100 Year Rainfall Event - 24 Hours**

Isopluvial (inches)

Lat 33°19'

Long 117°13'

$P_{24} = 6.0$

DPW GIS
Department of Public Works Geographic Information Services

SanGIS
We Have San Diego Covered!

N
W E
S



3 0 3 Miles

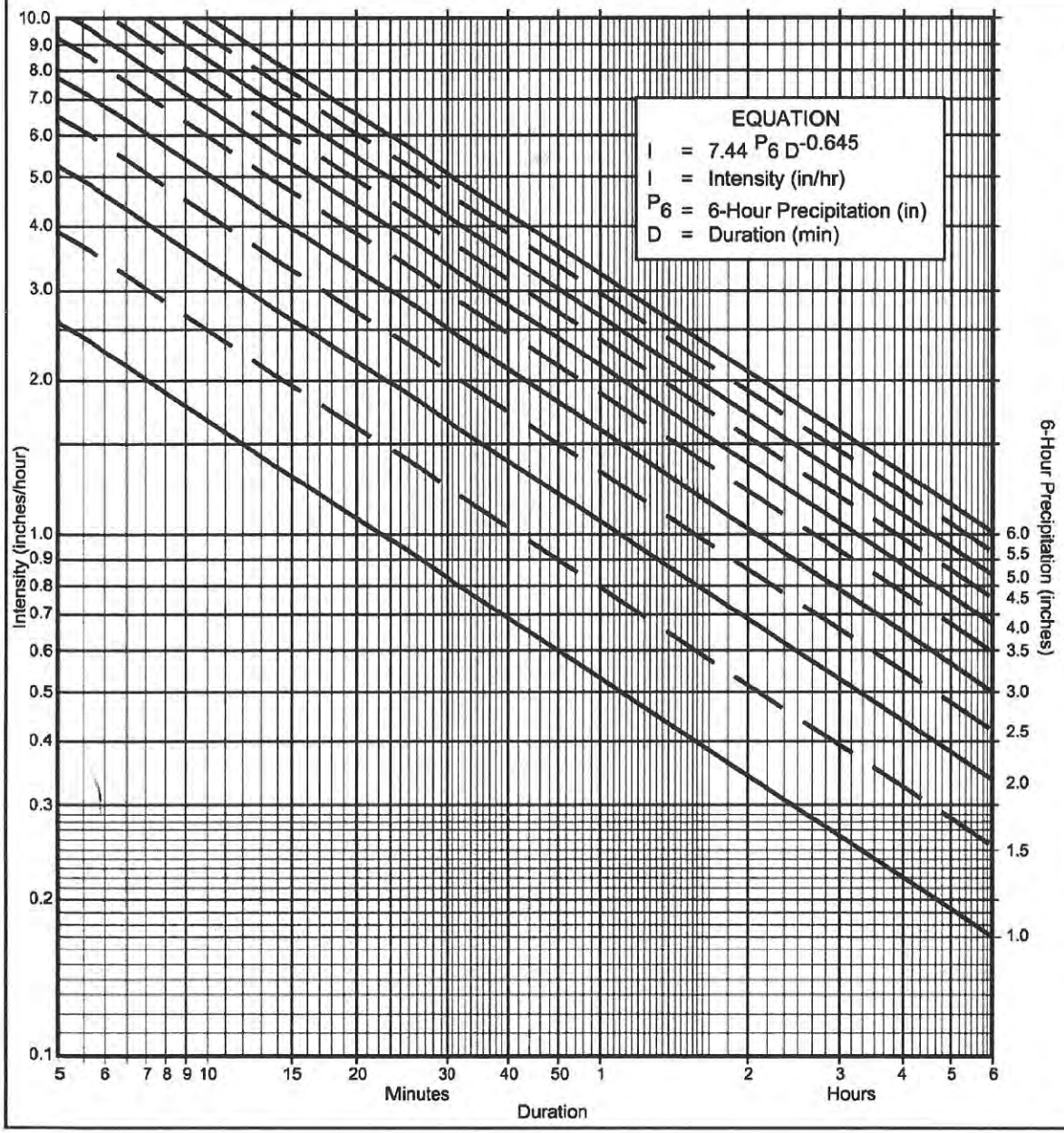
## Table 3-1
## RUNOFF COEFFICIENTS FOR URBAN AREAS

| Land Use | | Runoff Coefficient "C" | | | | |
|---|---|---|---|---|---|---|
| | | | Soil Type | | | |
| NRCS Elements | County Elements | % IMPER. | A | B | C | D |
| Undisturbed Natural Terrain (Natural) | Permanent Open Space | 0* | 0.20 | 0.25 | 0.30 | 0.35 |
| Low Density Residential (LDR) | Residential, 1.0 DU/A or less | 10 | 0.27 | 0.32 | 0.36 | 0.41 |
| Low Density Residential (LDR) | Residential, 2.0 DU/A or less | 20 | 0.34 | 0.38 | 0.42 | 0.46 |
| Low Density Residential (LDR) | Residential, 2.9 DU/A or less | 25 | 0.38 | 0.41 | 0.45 | 0.49 |
| Medium Density Residential (MDR) | Residential, 4.3 DU/A or less | 30 | 0.41 | 0.45 | 0.48 | 0.52 |
| Medium Density Residential (MDR) | Residential, 7.3 DU/A or less | 40 | 0.48 | 0.51 | 0.54 | 0.57 |
| Medium Density Residential (MDR) | Residential, 10.9 DU/A or less | 45 | 0.52 | 0.54 | 0.57 | 0.60 |
| Medium Density Residential (MDR) | Residential, 14.5 DU/A or less | 50 | 0.55 | 0.58 | 0.60 | 0.63 |
| High Density Residential (HDR) | Residential, 24.0 DU/A or less | 65 | 0.66 | 0.67 | 0.69 | 0.71 |
| High Density Residential (HDR) | Residential, 43.0 DU/A or less | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (N. Com) | Neighborhood Commercial | 80 | 0.76 | 0.77 | 0.78 | 0.79 |
| Commercial/Industrial (G. Com) | General Commercial | 85 | 0.80 | 0.80 | 0.81 | 0.82 |
| Commercial/Industrial (O.P. Com) | Office Professional/Commercial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (Limited I.) | Limited Industrial | 90 | 0.83 | 0.84 | 0.84 | 0.85 |
| Commercial/Industrial (General I.) | General Industrial | 95 | 0.87 | 0.87 | 0.87 | 0.87 |

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Existing = 22000 s.f. => 0.5 ac / 6.37 ac = 8% C = .35

Proposed = 30000 % => 0.7 ac / 6.37 = 11% C = .37




**Directions for Application:**

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

**Application Form:**

(a) Selected frequency 100 year

(b) $P_6$ = 3 in., $P_{24}$ = 6, $\frac{P_6}{P_{24}}$ = 50 %(2)

(c) Adjusted $P_6$(2) = 3 in.

(d) $t_x$ = _____ min.

(e) I = _____ in./hr. See spreadsheet

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

| P6 / Duration | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 2.63 | 3.95 | 5.27 | 6.59 | 7.90 | 9.22 | 10.54 | 11.86 | 13.17 | 14.49 | 15.81 |
| 7 | 2.12 | 3.18 | 4.24 | 5.30 | 6.36 | 7.42 | 8.48 | 9.54 | 10.60 | 11.66 | 12.72 |
| 10 | 1.68 | 2.53 | 3.37 | 4.21 | 5.05 | 5.90 | 6.74 | 7.58 | 8.42 | 9.27 | 10.11 |
| 15 | 1.30 | 1.95 | 2.59 | 3.24 | 3.89 | 4.54 | 5.19 | 5.84 | 6.49 | 7.13 | 7.78 |
| 20 | 1.08 | 1.62 | 2.15 | 2.69 | 3.23 | 3.77 | 4.31 | 4.85 | 5.39 | 5.93 | 6.46 |
| 25 | 0.93 | 1.40 | 1.87 | 2.33 | 2.80 | 3.27 | 3.73 | 4.20 | 4.67 | 5.13 | 5.60 |
| 30 | 0.83 | 1.24 | 1.66 | 2.07 | 2.49 | 2.90 | 3.32 | 3.73 | 4.15 | 4.56 | 4.98 |
| 40 | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 3.79 | 4.13 |
| 50 | 0.60 | 0.90 | 1.19 | 1.49 | 1.79 | 2.09 | 2.39 | 2.69 | 2.98 | 3.28 | 3.58 |
| 60 | 0.53 | 0.80 | 1.06 | 1.33 | 1.59 | 1.86 | 2.12 | 2.39 | 2.65 | 2.92 | 3.18 |
| 90 | 0.41 | 0.61 | 0.82 | 1.02 | 1.23 | 1.43 | 1.63 | 1.84 | 2.04 | 2.25 | 2.45 |
| 120 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 | 1.19 | 1.36 | 1.53 | 1.70 | 1.87 | 2.04 |
| 150 | 0.29 | 0.44 | 0.59 | 0.73 | 0.88 | 1.03 | 1.18 | 1.32 | 1.47 | 1.62 | 1.76 |
| 180 | 0.26 | 0.39 | 0.52 | 0.65 | 0.78 | 0.91 | 1.04 | 1.18 | 1.31 | 1.44 | 1.57 |
| 240 | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 | 0.98 | 1.08 | 1.19 | 1.30 |
| 300 | 0.19 | 0.28 | 0.38 | 0.47 | 0.56 | 0.66 | 0.75 | 0.85 | 0.94 | 1.03 | 1.13 |
| 360 | 0.17 | 0.25 | 0.33 | 0.42 | 0.50 | 0.58 | 0.67 | 0.75 | 0.84 | 0.92 | 1.00 |

**Intensity-Duration Design Chart - Template**

**FIGURE 3-1**

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

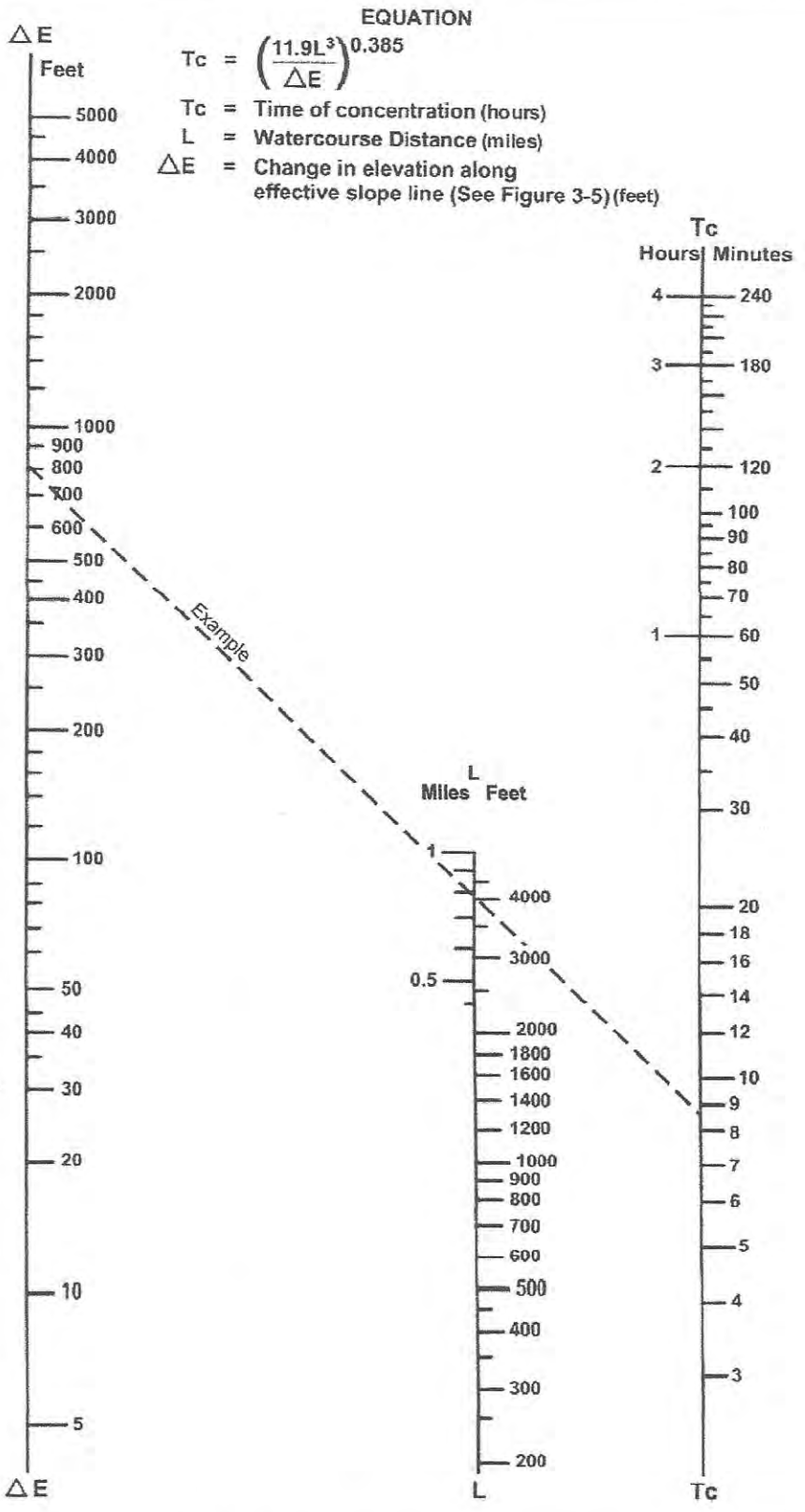
Table 3-2 provides limits of the length (Maximum Length ($L_M$)) of sheet flow to be used in hydrology studies. Initial $T_i$ values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

**Table 3-2**

**MAXIMUM OVERLAND FLOW LENGTH ($L_M$) & INITIAL TIME OF CONCENTRATION ($T_i$)**

| Element* | DU/ Acre | .5% | | 1% | | 2% | | 3% | | 5% | | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ | $L_M$ | $T_i$ |
| Natural | | 50 | 13.2 | 70 | 12.5 | 85 | 10.9 | 100 | 10.3 | 100 | 8.7 | 100 | 6.9 |
| LDR | 1 | 50 | 12.2 | 70 | 11.5 | 85 | 10.0 | 100 | 9.5 | 100 | 8.0 | 100 | 6.4 |
| LDR | 2 | 50 | 11.3 | 70 | 10.5 | 85 | 9.2 | 100 | 8.8 | 100 | 7.4 | 100 | 5.8 |
| LDR | 2.9 | 50 | 10.7 | 70 | 10.0 | 85 | 8.8 | 95 | 8.1 | 100 | 7.0 | 100 | 5.6 |
| MDR | 4.3 | 50 | 10.2 | 70 | 9.6 | 80 | 8.1 | 95 | 7.8 | 100 | 6.7 | 100 | 5.3 |
| MDR | 7.3 | 50 | 9.2 | 65 | 8.4 | 80 | 7.4 | 95 | 7.0 | 100 | 6.0 | 100 | 4.8 |
| MDR | 10.9 | 50 | 8.7 | 65 | 7.9 | 80 | 6.9 | 90 | 6.4 | 100 | 5.7 | 100 | 4.5 |
| MDR | 14.5 | 50 | 8.2 | 65 | 7.4 | 80 | 6.5 | 90 | 6.0 | 100 | 5.4 | 100 | 4.3 |
| HDR | 24 | 50 | 6.7 | 65 | 6.1 | 75 | 5.1 | 90 | 4.9 | 95 | 4.3 | 100 | 3.5 |
| HDR | 43 | 50 | 5.3 | 65 | 4.7 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| N. Com | | 50 | 5.3 | 60 | 4.5 | 75 | 4.0 | 85 | 3.8 | 95 | 3.4 | 100 | 2.7 |
| G. Com | | 50 | 4.7 | 60 | 4.1 | 75 | 3.6 | 85 | 3.4 | 90 | 2.9 | 100 | 2.4 |
| O.P./Com | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| Limited I. | | 50 | 4.2 | 60 | 3.7 | 70 | 3.1 | 80 | 2.9 | 90 | 2.6 | 100 | 2.2 |
| General I. | | 50 | 3.7 | 60 | 3.2 | 70 | 2.7 | 80 | 2.6 | 90 | 2.3 | 100 | 1.9 |

*See Table 3-1 for more detailed description




SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE 3-4

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds


North

SCALE 1:24000

0 2000 4000 6000 feet

0 ¼ mile ½ mile 1 mile

Represents 40 acres

FEDERAL ASSISTANCE — The preparation of this map was financed in part through a comprehensive planning grant from the Department of Housing and Urban Development.

SHEET NAME

Bonsall

SHEET NUMBER

12

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# ATTACHMENT 7

## Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

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