

Appendix I

Stormwater Control Plan for Vesting Tentative Tract Map and Final Development Plan

Stormwater Control Plan
for
Vesting Tentative Tract Map and
Final Development Plan
(TM 32,045/FDP)

October 14, 2025

Prepared for:

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Stormwater Control Plan Exhibit
Central Coast Post-Construction Requirements Calculator Spreadsheet
Web Soil Survey Hydrologic Soil Group Report

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I. Project Data

Table 1. Project Data Form

Project Name/Number	Shelby Residential Project (TM 32, 045/FDP)
Application Submittal Date	
Project Location	7400 Cathedral Oaks, Goleta, CA 93117, USA
Project Phase No.	Not Applicable
Project Type and Description	Fifty six single family homes with public street and associated infrastructure
Total Project Site Area (acres)	14.38 acres
Total New Impervious Surface Area	5.59 acres
Total Replaced Impervious Surface Area	0 SF
Total Pre-Project Impervious Surface Area	0 SF
Total Post-Project Impervious Surface Area	5.59 acres
Net Impervious Area	5.59 acres
Watershed Management Zone(s)	
Design Storm Frequency and Depth	2.43 inches (95 th percentile)
Urban Sustainability Area	The project is not in an Urban Sustainability Area

II. Setting

II.A. Project Location and Description

The project is located on the north side of the City of Goleta, north of Cathedral Oaks Road, and east of Northgate Drive, (see Figure 1). The project is situated and located entirely within the City of Goleta in Santa Barbara County and contains roughly 15 acres. The Glen Annie Golf Club Course borders the project site to the east, north, and northwest. El Encanto Creek borders the project site to the southwest. The proposed project site is currently vacant land with medium brush cover. The proposed development will consist of master planned residential community along with necessary infrastructures. The proposed VTTM will result in the development of 56 residential lots.

II.B. Existing Site Features and Conditions

The project site is currently vacant land with medium brush cover. The project is surrounded by a golf course to the north, east and west. El Encanto Creek runs along the westerly property line flowing north to south. Cathedral Oaks Road fronts the southerly property line. The current storm water is sheet flowing from the north part of the property to an existing street at the south end of the property, which

connects westerly to El Encanto Creek on the south west corner of the property and easterly along Cathedral Oaks Road. The site topography plan shows existing elevations ranging from approximately 250 feet (NAVD88) at the northeastern corner of the project site to approximately 150 feet along the Cathedral Oaks frontage. The site is accessible through a private driveway from Cathedral Oaks Road at the southwestern corner of the project site.

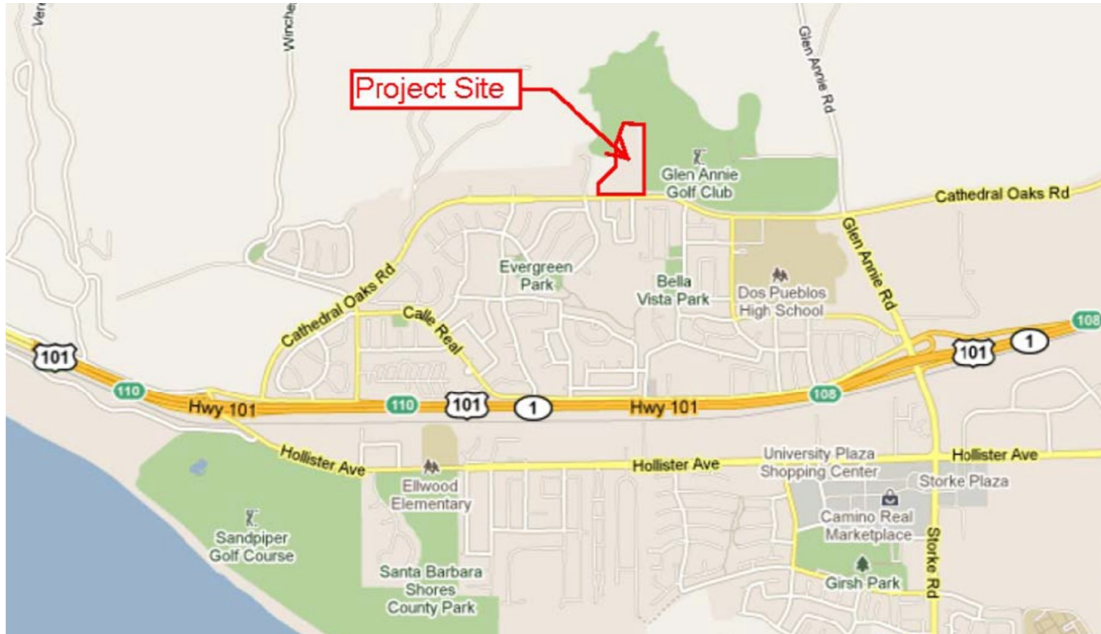


Figure 1. Vicinity Map



Figure 2. Existing Site Conditions

II.C. Opportunities and Constraints for Stormwater Control

The site is situated on the east side of El Encanto Creek and the site drains to the creek. The planned development is divided into two sub-areas and post construction runoff will be diverted to South-East and South-West part of the site. There will be detention/retention facilities to manage post storm water quality. The West part of the site detention basin drains to El Encanto Creek and the east retention basin drains to storm drain system @ existing street on South.

Site soils are expensive clay and relatively impermeable. Per the project geotechnical report Section 3.5, the City of Goleta has mapped the Northern portion of the project within an area of high landslide potential and noted that the Rincon geologic formation is susceptible to landslides (See project geotechnical report). So, the subject site is not feasible for infiltration BMP because of Hill side and susceptible to land slide.

II.D. Summary of Design Approach for Meeting the Post-Construction Requirements

The site is situated on the east side of El Encanto Creek and the site drains to the creek. The planned development is divided into two sub-areas and post construction runoff will be diverted to South-East and South-West part of the site. There will be detention/retention facilities to manage post storm water quality. The West part of the site detention basin drains to El Encanto Creek and the east retention basin drains to storm drain system @ existing street on South.

III. Low Impact Development Design Strategies

III.A. Site Design and Runoff Reduction (Performance Requirement No. 1)

III.A.1. Limit disturbance to creeks and natural drainage features, if applicable

The site consists required separation from the existing creek and there will be very little disturbance to install a detention basin outlet.

III.A.2. Minimize compaction of highly permeable soils, if applicable

Soils will be compacted as required for geotechnical purposes were specified per geotechnical recommendations.

III.A.3. Limitation of clearing and grading of native vegetation to minimum area needed, if applicable

Disturbance to the existing landscape onsite will be minimized.

III.A.4. Apply setbacks from creeks, wetlands, and riparian habitats, if applicable

Appropriate setback has been maintained pet the permitting agency requirements.

III.A.5. Minimization stormwater runoff

Impervious areas are limited to the hardscape improvements. Runoff will largely be dispersed into landscaped areas before entering the storm drain network or sheet-flowing offsite.

III.A.6. Use of drainage as a design element

The proposed onsite detention/ bioretention basin will add as a new design element to an area that is currently a grass lawn.

III.B. Optimization of Site Layout

The site has been master planned to minimize any impacts due to the subject site development and design supporting infrastructures. To minimize street length and pavement area, most of the street is double loaded (driveways on each side). Street widths, sidewalk widths, and the radius of the cul-de-sac (with mountable curbs) are the minimum allowable consistent with City public works standards and fire district requirements.

As a part of the development of this project, a storm drain system will be constructed within the property to collect the onsite storm water into a proposed detention basins that will discharge into the existing creek on the west side of the property north of Cathedral Oaks Road.

III.C. Use of Permeable Pavements

Due to the low permeability and landslide risks, permeable pavement has not been used but there is an option to permeable pavement with perforated under drain and impermeable layer at the bottom to use as bio-retention facility.

III.D. Dispersal of Runoff to Pervious Areas

Impervious areas are dispersed to landscaped areas where possible.

III.E. Stormwater Control Measures

As a part of the development of this project, a storm drain system will be constructed within the property to collect the onsite storm water into a proposed detention basin @ South-west and an underground ADS Stormtech @ South part of the site. The combined runoff from lots and streets will be routed to the detention/retention facilities. See LID Exhibit. The facilities will be designed and constructed to the criteria in the *Stormwater Technical Guide* (February 2014), and will include the following features:

- Catch Basin Inserts
- Bio-Swale
- Retention chamber
- Detention Basin
- Stormwater Quality Orifice outlet structure

IV. Documentation of Drainage Design

IV.A. Descriptions of Each Drainage Management Area

Table 2. Drainage Management Areas (DMAs) as shown on the Exhibit

DMA Name	DMA Type	Area (sf)	Surface Type	Drains to
DMA-1 New Imp	Drains to SCM	118919	Concrete, Asphalt, Roof	Bio-retention Basin (ADS Chamber)

DMA-1 Landscape	Self Treating	164221		Bio-retention Basin (ADS Chamber)
DMA-2 New Imp	Drains to SCM	124590	Concrete, Asphalt, Roof	Detention Basin
DMA-2 Landscape	Self Treating	172053		Detention Basin

Exhibit A shows the Storm Water Control Plan which consists propose site plan, grading, stormdrain and Drainage Management areas,

Drainage Management Area Descriptions

DMA-1 (Tributary Area @ East) – Drainage areas are located at the project’s easterly part just north of Cathedral Oaks Road and encompass the proposed housing pad development areas. The catch basins on the east side of the project will convey the storm water from the easterly side of the project to an underground detention system consisting of ADS Stormtech MC-7200 system and discharge outflow to the existing stormdrain @ east of Cathedral Oaks road

DMA-2 (Tributary Area @ West) – Drainage areas are situated on the West part of the site and encompass the proposed housing pad development areas. Majority runoff at these areas run towards South and West direction via street or pipe flow. There are curb-inlet catch basins @ North part of this DMA which capture runoff from street and take to bio-swale @ South-West part of the site. Runoff from the bio-swale and other tributary areas flows to the detention basin 2. All runoff will be transported to the basin through pipe flow. The proposed detention basin design and capacity information calculations are shown in hydrology report. The outflow from the detention basin will be controlled via orifice outlet and designed to maintain the flow requirements per SBFCD. So, the basin will be able to store difference of flow per the SB flow requirements.

IV.B. Description of Storm Water Control Measures

Two Stormwater Structural Control Measures are proposed for this development.

Underground Retention Chamber (Basin #1, ADS StormTech Chamber MC-7200): The proposed retention facility situated at the Southeast part of the site and will capture all flow from DMA-1. ADS Underground Stormtech system is designed to meet the most stringent industry performance standards for superior structural integrity while providing owners with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. This underground chamber will help to retain excess runoff and outlet will match the existing runoff rate.

Detention Basin (Basin #2): This on-site detention basin is located at the South-west part of the site to capture runoff from DMA-2. The catch basins on the west side of the project will convey the storm water through storm drain pipes to the proposed detention basin, which in turn discharges the water to El Encanto Creek. There is a orifice water quality control outlet with stand pipe at the basin. The proposed detention basin system is designed with the capacity to contain the developed project run-off excess and to discharge a run-off volume that is equal to the existing run-off volume from the site (before development). The post-development discharge volume is equal to the predevelopment discharge volume.

IV.B. Tabulation and Sizing Calculations

IV.B.1. Information Summary for LID Facility Design

Total Project Area (Square Feet)	579,784 SF
Design Storm Depth	2.43 inches
Applicable Requirements	Tier 4 (Tier 3 requirements for Peak Runoff Discharge and Water Quality Treatment)

See the attached entries and results in the Central Coast Region Stormwater Control Measure Sizing Calculator.

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

On-site activities that could potentially produce stormwater pollutants include:

- Landscape maintenance
- Trash Management

V.B. Potential Pollutant Sources and Source Control Measures

Table 3. Pollutant Sources and Source Control Measures

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
Landscape maintenance	Landscaping designed to minimize irrigation and runoff, and to minimize the use of fertilizers and pesticides. Specify plants that are tolerant of saturated soil conditions in landscaped self-retaining areas. Select plants appropriate to site soils, slopes, climate, land use, ecological consistency, and plant interactions.	Landscaping will be maintainable using minimum or no pesticides.
Trash Management	Trash and recycled materials will be collected and stored in areas shown on site plan.	All dumpsters will be posted with signs stating "Do not dump hazardous materials here" or similar
Storm Drain Inlets	MS4 Stenciling and Signage	All inlets will be posted with signs stating "No dumping! Flows to Ocean"

Street & Sidewalk	Trash and recycled materials will be collected and stored in areas shown on site plan.	Sweep sidewalks and pavements regularly to prevent accumulation of litter and debris.
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VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The detention and bio-retention basin will both be owned and maintained by the owners of the subject development. Inspections and maintenance will be performed by owner or owner's personnel, and will be carried out according to the maintenance requirements of the County of Santa Barbara/California General permit requirements. The owner is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism needs to be placed to maintain the BMPs at the frequency stated in the O&M Plan.

A separate maintenance manual will be prepared during final design. The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to BMP failure. Routine maintenance activities and the frequency at which they will be conducted need to be at the O&M plan.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

The detention basin and corresponding drainage structures will be maintained on the following schedule at a minimum. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan to be submitted for approval prior to the completion of construction.

Weekly: The facilities will be examined for visible trash during regular policing of the site, and trash will be removed.

After Significant Rain Events: A significant rain event is one that produces approximately a half-inch or more rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted:

The surface of the facility will be observed to confirm there is no ponding.

- Inlets will be inspected, and any accumulations of trash or debris will be removed.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.

Prior to the Start of the Rainy Season: In September of each year, the facility will be inspected to confirm there is no accumulation of debris that would block flow, and that growth and spread of plantings does not block inlets or the movement of runoff across the surface of the facility.

Annual Landscape Maintenance: In December – February of each year, vegetation will be cut back as needed, debris removed, and plants and mulch replaced as needed. The concrete work will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the 6-inch reservoir depth.

VII. Stormwater Control Plan/ Construction Documents Cross-Checklist

Table 4. Stormwater Control Plan / Construction Documents Cross-Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
p. 5 and Exhibit	Basin #1, ADS StormTech Chamber MC-7200	Storm Water Control Plan
p.5 and Exhibit	Basin #2, Detention Basin	Storm Water Control Plan

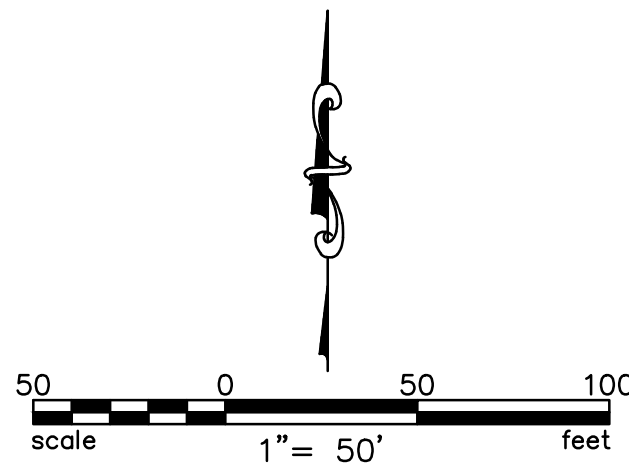
VIII. Certifications

The preliminary design of Stormwater Control Measures and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide.



STORMWATER CONTROL PLAN

VESTING TENTATIVE TRACT MAP
AND
FINAL DEVELOPMENT PLAN
(05-154-GPA/RZN/TM 32,045/FDP)
DEVELOPED HYDROLOGY MAP



PROPOSED DMA-2

DRAINAGE AREA RETAINED: PART OF NEW DEVELOPMENT, ROOF AREA,
ROADS & HARDSCAPE (6.50 ac)

TYPE OF BMP: DETENTION BASIN & VEGETATED BIO-SWALE

MITIGATION VOL, $V_m=34,320$ CU-FT

DESIGNED VOL, $V_{storage}= 37,026$ CU-FT

BMP: DETENTION BASIN

(PER DETAILS ON APPENDIX F)

DMA-2

DMA-1

DMA-2

DMA-1

TYPICAL TRASH ENCLOSURE:
@ SIDEYARD PER ARCHITECTURAL PLAN

TYPICAL TRASH ENCLOSURE:
@ SIDEYARD PER ARCHITECTURAL PLAN

DMA Name	DMA Type	Area (sf)	Surface Type	Drains to
DMA-1 New Imp	Drains to SCM	118919	Concrete, Asphalt, Roof	Bio-retention Basin (ADS Chamber)
DMA-1 Landscape	Self Treating	164221		Bio-retention Basin (ADS Chamber)
DMA-2 New Imp	Drains to SCM	124590	Concrete, Asphalt, Roof	Detention Basin
DMA-2 Landscape	Self Treating	172053		Detention Basin

TABLE 4: LOW IMPACT DEVELOPMENT RETENTION BMP SIZING SUMMARY

DRAINAGE MANAGEMENT AREA	AREA (ACRE)	IMPERVIOUS AREA (ACRE)	C (RUNOFF COEFFICIENT)	RAINFALL (INCH)	Q (DESIGN DISCHARGE)	RETENTION VOLUME REQUIRED, CU-FT	VOLUME PROVIDED, CU-FT	BMP NAME
DMA-1	6.5	2.73	0.29	2.4	16480	32354	32500	ADS STORMTECH MC-7200
DMA-2	6.81	2.86	0.29	2.4	17484	34320	37026	DETENTION BASIN

TABLE 5: BMP SUMMARY

DMA	BMP TYPE	BMP NAME	NOTE
DMA-1	Retention Chamber	StormTech Chamber MC-7200	LID Plans in Appendix E and BMP details in Appendix F
	Media Filter	Stormdrain Inlet Filter Insert	
	Bio-Filtration	Onsite Bio-Swale	
DMA-2	Detention Basin	Onsite Detention Basin	
	Water Quality Inlet	Orifice Detention Basin Outlet	
	Media Filter	Stormdrain Inlet Filter Insert	
	Bio-Filtration	Onsite Bio-Swale	

PROPOSED DMA-1

DRAINAGE AREA RETAINED: PART OF NEW DEVELOPMENT, ROOF AREA, ROADS &
HARDSCAPE (6.50 ac)

TYPE OF BMP: UNDERGROUND RETENTION SYSTEM (CAPTURE & REUSE)

MITIGATION VOL, $V_m=32,354$ CU-FT

DESIGNED VOL, $V_{storage}= 32,500$ CU-FT

BMP MODEL: ADS STORMTECH MC-7200

(PER DETAILS ON APPENDIX F)

ACCEPTED:

REVIEWED: SENIOR ENGINEER

DATE

RECOMMENDED: DEPUTY DIRECTOR

DATE

CITY OF GOLETA
DEPARTMENT OF PUBLIC WORKS

PREPARED BY:



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DATE:

EXP. 06/30/2027



VESTING TENTATIVE TRACT MAP 32,045
7400 CATHEDRAL OAK ROAD
P.N. 01-023.01

STORMWATER CONTROL PLAN

SHEET NUMBER

1 OF 1

DRAWING NUMBER
(CITY OF GOLETA)

PLOT DATE:
08-10-2025

Central Coast Region Stormwater Control Measure Sizing Calculator

1. Project Information

Project name:	VTTM and FDP (TM 32, 045/FDP)
Project location:	7400 Cathedral Oaks Road, Goleta, CA
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	2.4
Total project area (ft2):	579784
Total DMA area (ft2):	579784
Total new impervious area (ft2):	243509
Total replaced impervious within a USA (ft2):	
Total replaced impervious not in a USA (ft2):	
Total pervious/landscape area (ft2):	336275
Total SCM area (ft2):	

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
DMA-1 New Imp	Drains to SCM	118919	Concrete or asphalt	New	Retention Basin
DMA-1 Landscape	Self-Treating	164221			
DMA-2 New Imp	Drains to SCM	124590	Concrete or asphalt	New	Detention Basin
DMA-2 Landscape	Self-Treating	172053			

DMA Summary Area

Total assigned DMA area (ft2):	579783
New impervious area (ft2):	243509
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	336274

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infiltr. Rate (in/hr)	Area (ft2)
Retention Basin	Bio-retention	2	HSG D	0.25	5750
Detention Basin	Bio-retention	2	HSG D	0.25	12280

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
Retention Basin	25877	11.25	359.6	
Detention Basin	26816	5.46	174.6	

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio



United States
Department of
Agriculture



NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Santa Barbara County, California, South Coastal Part

Goleta



February 2, 2011

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

-  Very Stony Spot
-  Wet Spot
-  Other

Special Line Features

-  Gully
-  Short Steep Slope
-  Other

Political Features

-  Cities

Water Features

-  Oceans
-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

MAP INFORMATION

Map Scale: 1:3,060 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 11N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 5, Jan 3, 2008

Date(s) aerial images were photographed: 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Santa Barbara County, California, South Coastal Part (CA673)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AhE2	AYAR CLAY, 15 TO 30 PERCENT SLOPES, ERODED	4.1	8.1%
AhF2	AYAR CLAY, 30 TO 50 PERCENT SLOPES, ERODED	9.6	19.2%
DaC	DIABLO CLAY, 2 TO 9 PERCENT SLOPES	25.0	49.8%
DaD	DIABLO CLAY, 9 TO 15 PERCENT SLOPES	4.6	9.2%
GU	GULLIED LAND	6.9	13.8%
Totals for Area of Interest		50.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Santa Barbara County, California, South Coastal Part

AhE2—AYAR CLAY, 15 TO 30 PERCENT SLOPES, ERODED

Map Unit Setting

Elevation: 200 to 1,900 feet

Mean annual precipitation: 16 to 24 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 300 to 330 days

Map Unit Composition

Ayar and similar soils: 85 percent

Minor components: 15 percent

Description of Ayar

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from mudstone or calcareous shale

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 40 to 60 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability (nonirrigated): 4e

Ecological site: CLAYEY (R015XD001CA)

Typical profile

0 to 40 inches: Clay

40 to 44 inches: Weathered bedrock

Minor Components

Zaca

Percent of map unit: 3 percent

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Gaviota

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Los osos

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Unnamed

Percent of map unit: 3 percent

Unnamed

Percent of map unit: 3 percent

AhF2—AYAR CLAY, 30 TO 50 PERCENT SLOPES, ERODED

Map Unit Setting

Elevation: 200 to 1,900 feet
Mean annual precipitation: 16 to 24 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 300 to 330 days

Map Unit Composition

Ayar and similar soils: 85 percent
Minor components: 15 percent

Description of Ayar

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from mudstone or calcareous shale

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches

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Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability (nonirrigated): 6e
Ecological site: CLAYEY (R015XD001CA)

Typical profile

0 to 40 inches: Clay
40 to 44 inches: Weathered bedrock

Minor Components

Gaviota

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Los osos

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Todos

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Zaca

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Unnamed

Percent of map unit: 3 percent

DaC—DIABLO CLAY, 2 TO 9 PERCENT SLOPES

Map Unit Setting

Elevation: 50 to 700 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 60 to 62 degrees F

Frost-free period: 300 to 330 days

Map Unit Composition

Diablo and similar soils: 85 percent

Minor components: 15 percent

Description of Diablo

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from mudstone and/or soft shale

Properties and qualities

Slope: 2 to 9 percent

Depth to restrictive feature: 45 to 60 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability (nonirrigated): 3e

Ecological site: CLAYEY (R015XD001CA)

Typical profile

0 to 50 inches: Clay

50 to 54 inches: Weathered bedrock

Minor Components

Ayar

Percent of map unit: 4 percent

Landform: Hills

Landform position (two-dimensional): Backslope

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Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Milpitas

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Positas

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Zaca

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

DaD—DIABLO CLAY, 9 TO 15 PERCENT SLOPES

Map Unit Setting

Elevation: 50 to 3,000 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 300 to 330 days

Map Unit Composition

Diablo and similar soils: 85 percent
Minor components: 15 percent

Description of Diablo

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from mudstone and/or soft shale

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Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 45 to 60 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability (nonirrigated): 3e
Ecological site: CLAYEY (R015XD001CA)

Typical profile

0 to 50 inches: Clay
50 to 54 inches: Weathered bedrock

Minor Components

Ayar

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Milpitas

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Positas

Percent of map unit: 4 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Zaca

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

GU—GULLIED LAND

Map Unit Setting

Elevation: 0 to 1,000 feet

Mean annual air temperature: 59 to 61 degrees F

Frost-free period: 290 to 320 days

Map Unit Composition

Gullied land: 100 percent

Description of Gullied Land

Setting

Landform: Terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Riser

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Alluvium

Interpretive groups

Land capability classification (irrigated): 8e

Land capability (nonirrigated): 8e

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

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Map—Hydrologic Soil Group



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 A

 A/D

 B

 B/D

 C

 C/D

 D

 Not rated or not available

Political Features

 Cities

Water Features

 Oceans

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

MAP INFORMATION

Map Scale: 1:3,060 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 11N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 5, Jan 3, 2008

Date(s) aerial images were photographed: 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Santa Barbara County, California, South Coastal Part				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AhE2	AYAR CLAY, 15 TO 30 PERCENT SLOPES, ERODED	D	4.1	8.1%
AhF2	AYAR CLAY, 30 TO 50 PERCENT SLOPES, ERODED	D	9.6	19.2%
DaC	DIABLO CLAY, 2 TO 9 PERCENT SLOPES	D	25.0	49.8%
DaD	DIABLO CLAY, 9 TO 15 PERCENT SLOPES	D	4.6	9.2%
GU	GULLIED LAND		6.9	13.8%
Totals for Area of Interest			50.2	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie.

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The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

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