GENERAL BIOLOGICAL RESOURCE ASSESSMENT AND HABITAT ASSESSMENT

APN 786-601-01

In

City of Mission Viejo, Orange County, CA

USGS 7.5-minute topographic quadrangle map San Juan Capistrano in Section 32 of Township 6 South, Range 7 West



Prepared For:

City of Mission Viejo

Prepared By and Principal Investigator**:**

GONZALES ENVIRONMENTAL CONSULTING, LLC

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Report Date: Updated Project boundaries 1-2020

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I. TITLE PAGE

A. **Date report prepared**: 1-2020

B. **Report Title:** GENERAL BIOLOGICAL RESOURCE ASSESSMENT AND HABITAT ASSESSMENT APN 786-601-01

C. **Project site location:** USGS 7.5-minute topographic San Juan Capistrano quadrangle map in Section 32 of Township 6 South, Range 7 West

D. **Assessor's Parcel Number(s) and any related County assigned planning application numbers (i.e., Tract Map #) :** APN 786-601-01

E. **Owner/Applicant:** City of Mission Viejo
Address:
200 Civic Center
Mission Viejo, CA 92691

F. **Principal Investigator(s):** Teresa Gonzales
Address:
358 Crystal Drive
San Jacinto, CA 92583
Phone: 760.777-1621

G. **Name and phone number of person preparing report and of all persons who performed fieldwork on the site.**

Name of Person	Role on project
Teresa Gonzales	Prepared report and performed fieldwork
Paul Gonzales	Performed fieldwork

II. EXECUTIVE SUMMARY

Findings and Conclusions

The City of Mission Viejo has proposed expansion of Robert A. Curtis Park to the east of the existing park. The project site is approximately 53 acres, located in the City of Mission Viejo in Orange County, California. In September and October 2019, Teresa Gonzales, Principal Biologist and Paul Gonzales Senior Biologist, conducted general biological resource assessment, native plant assessment and habitat assessment for coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), coastal California gnatcatcher (*Polioptila californica californica*) and western spadefoot toad (*Spea hammondii*) to characterize biological resources on the site, and to identify any biological constraints to the proposed project.

Orange County Southern Subregion Habitat Conservation Plan (HCP)

The site is within the Southern Subregion Habitat Conservation Plan (HCP). Therefore, the proposed project will impact designated buffer areas for open space/reserve areas.

Endangered, Threatened and Sensitive Species

Several special-status plant and animal species have the potential to occur on site. The following species were found on the project site:

Federal

Coastal California gnatcatcher (*Polioptila californica californica*) federal threatened species were detected within the project limits or immediately adjacent. The site is within the Orange County Southern Subregion Habitat Conservation Plan (HCP) and outside of the revised critical habitat designation for the coastal California gnatcatcher (USFWS 2007). Habitat Assessment surveys were conducted on September 16, 2019 and found three coastal California gnatcatcher (*Polioptila californica californica*) foraging on the site. They were observed only once during surveys of the area. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for sensitive species detailed above are only good for one year. Regardless of the survey results, sensitive species cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of sensitive species.***

Streambed/Wetlands

The site has three intermittent drainages located on the project site. There are no wetlands on the project site. The drainage has minimal vegetation. Flow is evident from channelization, darker soil within light soil, banking, etc. The proposed project will impact the jurisdictional areas as currently designed. There are 0.301 acre of federal jurisdiction, and 6.142 acre of state jurisdiction.

The drainage areas are under the jurisdiction of the California Department of Fish and Game, U.S. Army Corps of Engineers and California Regional Water Quality Control Board. Permits/Agreements for activities within the streambed will be required by the California Department of Fish and Game, U. S. Army Corps of Engineers and California Regional Water Quality Control Board. Final authority over the area rests with the appropriate agencies.

III. PROJECT AND PROPERTY DESCRIPTION

A. Property Description

Proposed Project Area

Mission Viejo is steeped in a tradition that dates back to the vanishing days of men on horses driving cattle.

Nearly 25 years ago, the Mission Viejo Co. bought a 10,000-acre section of Rancho Mission Viejo from the O'Neill family, which once owned much of the land from Oceanside to El Toro.

The company would create a master plan for a community, specifying the number of parks, homes, recreational activities and retail spaces.

The rolling hills of the valley, home to a sea of grazing cattle, soon would also become home to seekers of "The California Promise."

The vision for the community began in 1963 with a planner's blueprint. The general development plan wound its way through the maze of county permits and by 1966 the first homes were sold, according to the Mission Viejo Co.

Fewer than a handful of changes - among them the additions of Saddleback College and Lake Mission Viejo - have been made to that initial plan (Orange County.Net).

The elevation at the City of Mission Viejo is 410 feet above sea level. The area is composed of rolling hills and valleys with oak woodland, grasslands, and streams.

Proposed Project Site

The project site is located east of Felipe Road/Olympiad Road, north and south of what would be the continuation of La Paz Road, and south of what would be the continuation of Escaltron (Figures 1, 2, 3). Single family homes are located on the western portion of Felipe Road/Olympiad Road, Robert A. Curtis Park is located east of Olympiad Road, with the project wrapping around to the north, south and east.

The site is located within San Bernardino Meridian in portions of Section 32 in Township 6 South, Range 7 West in Orange County, California (Figures 1, 2 and 3). This location is shown on the San Juan Capistrano, California 7.5-minute U.S. Geological Survey (USGS) quadrangle (San Juan Capistrano Photorevised 1981). The approximate center of the site is located at -117.631663˚west and latitude 33.631663˚north.

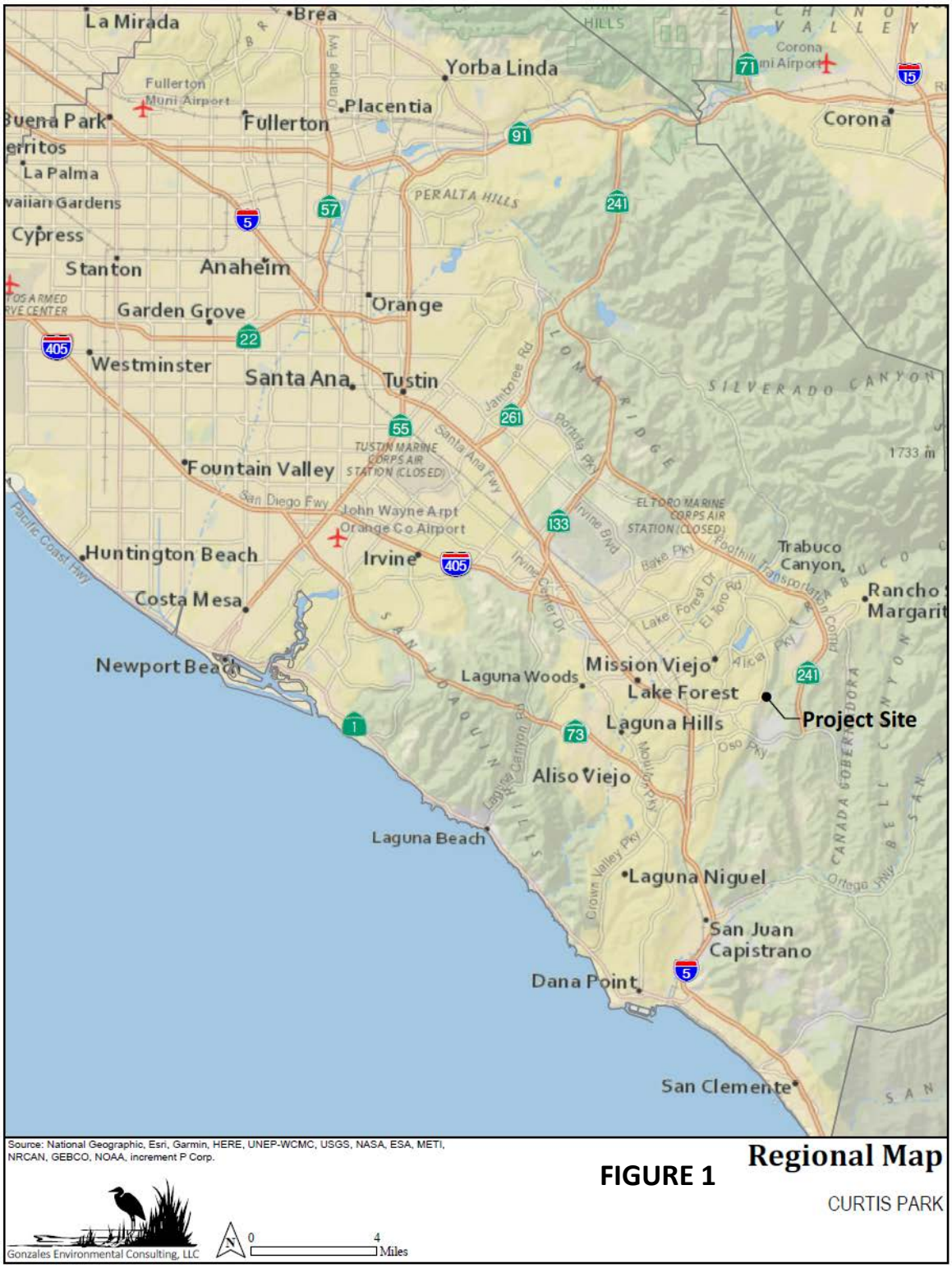


FIGURE 1 **Regional Map**

CURTIS PARK

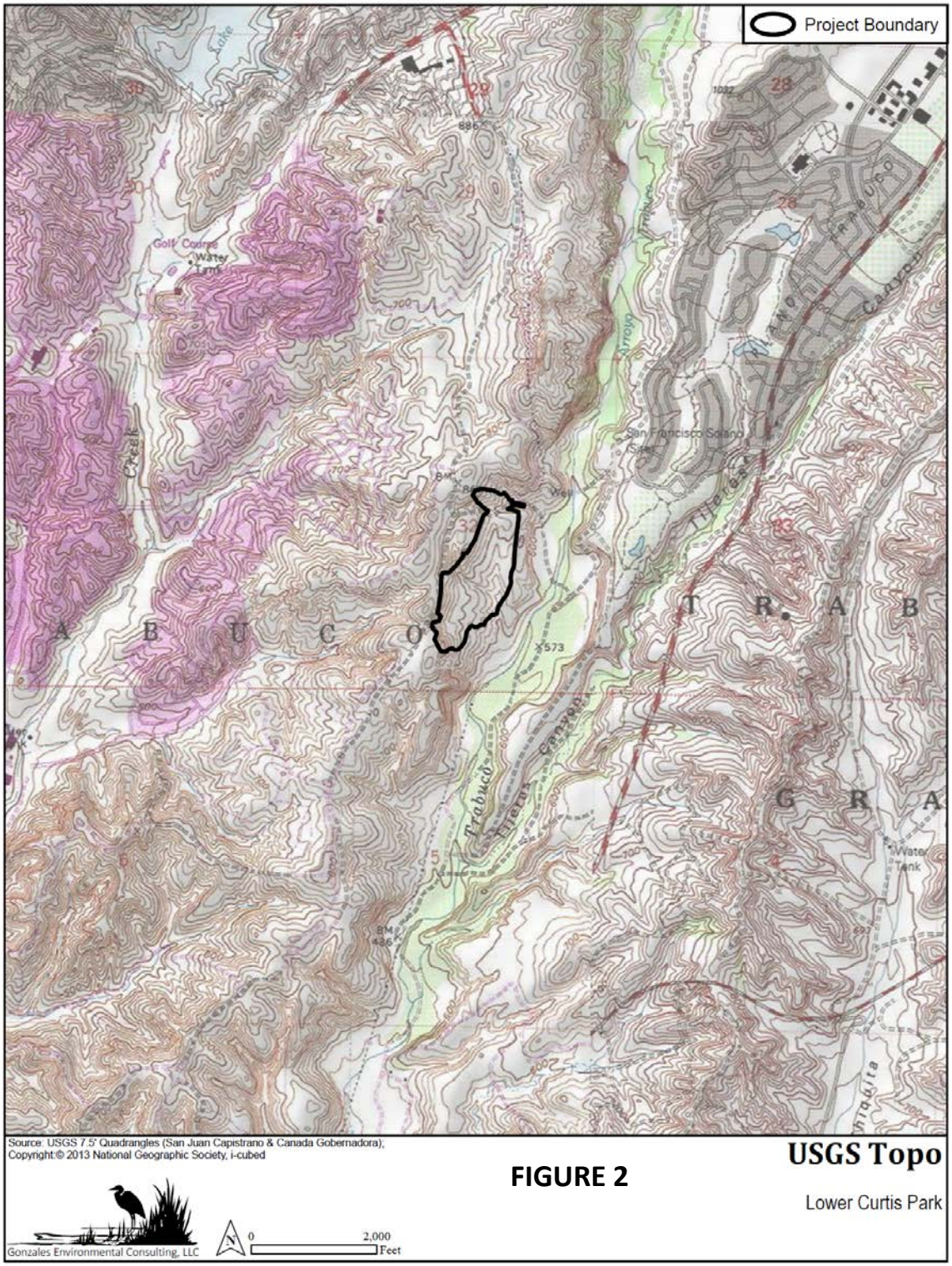

Project Boundary
Golf Course Water Tank
Trabuco Canyon
Tijeras Canyon
San Francisco Solano Site
A B U C O
T R. A B
G R A
Water Tank
Source: USGS 7.5' Quadrangles (San Juan Capistrano & Canada Gobernadora);
Copyright © 2013 National Geographic Society, i-cubed
Gonzales Environmental Consulting, LLC
N
0
2,000
Feet
USGS Topo
Lower Curtis Park

FIGURE 2


Tarzona
Tabuenca
Fonda
Robert A
Curtis Park
Olympiad Rd
La Paz Rd
Felipe Rd
Project Boundary
Aerial Photograph
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

FIGURE 3

The western portion of the site (Robert A. Curtis Park) is slightly sloping to the east. The eastern portion of the site is steeply sloping to slightly sloping towards the project's eastern boundary. The site occurs at an elevation between 652 and 797 feet above mean sea level (msl). The developed portion of the site (Robert A. Curtis Park) (Park) includes baseball fields, parking, restrooms, maintenance buildings and landscaping. A landscape storage area is located in the northern portion of the site, east of the entrance to the Park. West of the Park is single-family residential housing.

The non-improved portion of the site is covered with 6-7 foot tall vegetation consisting of native wreath plant (*Stephanomeria diegensis*) and Canada horseweed (*Erigeron canadensis*) and non-native black mustard (*Brassica nigra*). A stand of Menzies goldenbush (*Isocoma menziesii*) Alliance is located above Drainage 2. Pockets of native vegetation mixed with non-native exotics are found throughout the site.

Drainage 1 is located in the northern portion of the project site and begins with an over the side drainage inlet from Olympiad Road near the entrance to the Park. This drainage has native plants California fan palm (*Washingtonia filifera*), coast live oak (*Quercus agrifolia*), arroyo willow (*Salix lasiolepis*), and coyote bush (*Baccharis pilularis*) dominated by non-native species Mexican fan palm (*Washingtonia robusta*), and pampas grass (*Cortaderia jubata*). The drainage hydrologically connects to Arroyo Trabuco. Soils are consistent with mapping and contain clay loam.

Drainage 2 is a forked drainage with both forks starting at the edge of the park (one at the southeastern edge (T-1) and the other at the eastern edge of the landscape/maintenance area. This drainage contains primarily non-natives Artichoke thistle (*Cynara cardunculus*), Castor bean (*Ricinus communis*) and Black mustard (*Brassica nigra*) until reaching their confluence. Smaller sized Coast live oak trees are located in scattered areas in and around T-1. Once merged coast live oak, arroyo willow, lemonade berry (*Rhus integrifolia*) and stinging nettle (*Urtica dioica*) are the dominant species. The drainage hydrologically connects to Arroyo Trabuco. Soils in both forks of Drainage 2 consist of clay soils and are consistent with what is mapped.

Drainage 3 starts with an over the side inlet from Olympiad Road across from La Paz Road. D-3 splits into two channels midway down slope. One channel merges with D-2 and the other hydrologically connects directly to Arroyo Trabuco. Both forks of Drainage 3 contain primarily non-native Artichoke thistle until midway down slope. Smaller sized Coast live oak trees and Blue elderberry (*Sambucus nigra* ssp. *caerulea*) are located in scattered areas in and around both forks of D-3. Once merged coast live oak, arroyo willow, lemonade berry (*Rhus integrifolia*) and stinging nettle (*Urtica dioica*) are the dominant species. Soils in both forks of Drainage 3 consist of clay soils and are consistent with what is mapped.

The locations of the native plant communities within the project footprint have been impacted by anthropogenic activities in the area.

Potential rare, and/or endangered or otherwise sensitive habitats associated with the proposed project site include Southern Coast Live Oak Riparian Forest, western spadefoot (*Spea hammondii*), coastal California gnatcatcher (*Polioptila californica californica*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), Dulzura pocket mouse (*Chaetodipus californicus femoralis*), southern California legless lizard (*Anniella stebbinsi*), California glossy snake (*Arizona elegans occidentalis*), San Bernardino ringneck snake (*Diadophis punctatus modestus*), two-striped gartersnake (*Thamnophis hammondii*), coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), and red-diamond rattlesnake (*Crotalus ruber*).

SOILS

The soil associations mapped for the area are Alo-Bosanko association. Alo-Bosanko association soils are strongly sloping to steep, well drained clays on coastal foothills. The soils formed in material weathered from calcareous sandstone and shale. Slopes are 9-50%. The plant cover consists of annual grasses, mustard, and other forbs. Elevation ranges from 200-2,500 feet. The average annual rainfall is 12-20 inches, and the average annual air temperature is 59-62 degrees F. The frost-free season is 300 to 350 days. The soil series mapped for the area are described in Table 1 and shown on Figure 4. The soils found are consistent with the soils mapped for the area.

TABLE 1

SOIL SERIES MAPPED FOR THE AREA

Symbol	Name	Description
126	Bosanko clay, 9 to 15 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 9-15%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
127	Bosanko clay, 15 to 30 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 15-30%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
128	Bosanko clay, 30 to 50 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 30-50%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
129	Bosanko-Balcom complex, 15 to 30 percent slopes	Bosanko-Balcom complex is about 45% Bosanko clay and about 40% Balcom clay loam. The Bosanko clay is on north-and east-facing side slopes and in swales. The Balcom clay loam is on hill ridgetops and on south-and west-facing side slopes. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 15-30%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.

Symbol	Name	Description
133	Botella clay loam, 9 to 15 percent slopes	Consists of well drained soils on alluvial fans. These soils formed in sedimentary alluvium. Slopes are 2-15%. Elevation ranges from 25-1,500 feet. The vegetation is mainly annual grasses and forbs and some oak trees and brush. Precipitation is 12-20 inches, and the average annual air temperature is about 62 degrees F. The frost free season is 260-350 days.
134	Calleguas clay loam, 50 to 75 percent slopes, eroded	Consists of well drained soils on uplands. These soils formed in material weathered from lime coasted shale or lime coated sandstone, or both. Slopes are 50-75%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses and forbs, mostly mustard and brush. Precipitation is 13-20 inches, and the average annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
141	Cieneba sandy loam, 15 to 30 percent slopes	Consists of somewhat excessively drained soils. These soils formed in material weathered from granitic rocks of the Santa Ana Mountains and from the sandstone of the coastal foothills. Slopes are 9-75%. Elevation ranges from 200-4,000 feet. The vegetation is mostly brush. Precipitation is 14-25 inches, and the average annual air temperature is 59-62 degrees F. The frost free season is 200-340 days.
146	Corralitos loamy sand	Consists of somewhat excessively drained soils on fans in long, narrow valleys. These soils formed in mixed coarse textured alluvium. Slopes are 0-5%. Elevation ranges from 50-1,500 feet. The vegetation is mainly annual grasses and forbs and some trees and brush generally near stream channels. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 200-300 days.
149	Cropley clay, 2 to 9 percent slopes, warm MAAT, MLRA 19	Consists of well drained soils on fans and valley fill. These soils formed in fine textured alluvium derived from sedimentary rocks. Slopes are 0-9%. Elevation ranges from 50-1,000 feet. The vegetation is annual grasses and forbs. Precipitation is 10-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 280-340 days.
179	Myford sandy loam, thick surface, 2 to 9 percent slopes	Consists of moderately well drained soils on marine terraces. These soils formed in sandy sediments. Slopes are 0-30%. Elevation ranges from 50-1,500 feet. The vegetation generally is annual grasses and forbs and scattered low growing brush. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 270-350 days.

Symbol	Name	Description
198	Soboba cobbly loamy sand, 0 to 15 percent slopes	Consists of excessively drained soils on flood plains and alluvial fans. These soils formed in mixed alluvium. Slopes are 0-15%. Elevation ranges from 50-2,500 feet. The vegetation is annual grasses, forbs, cactus, brush, and some trees. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 250-300 days.

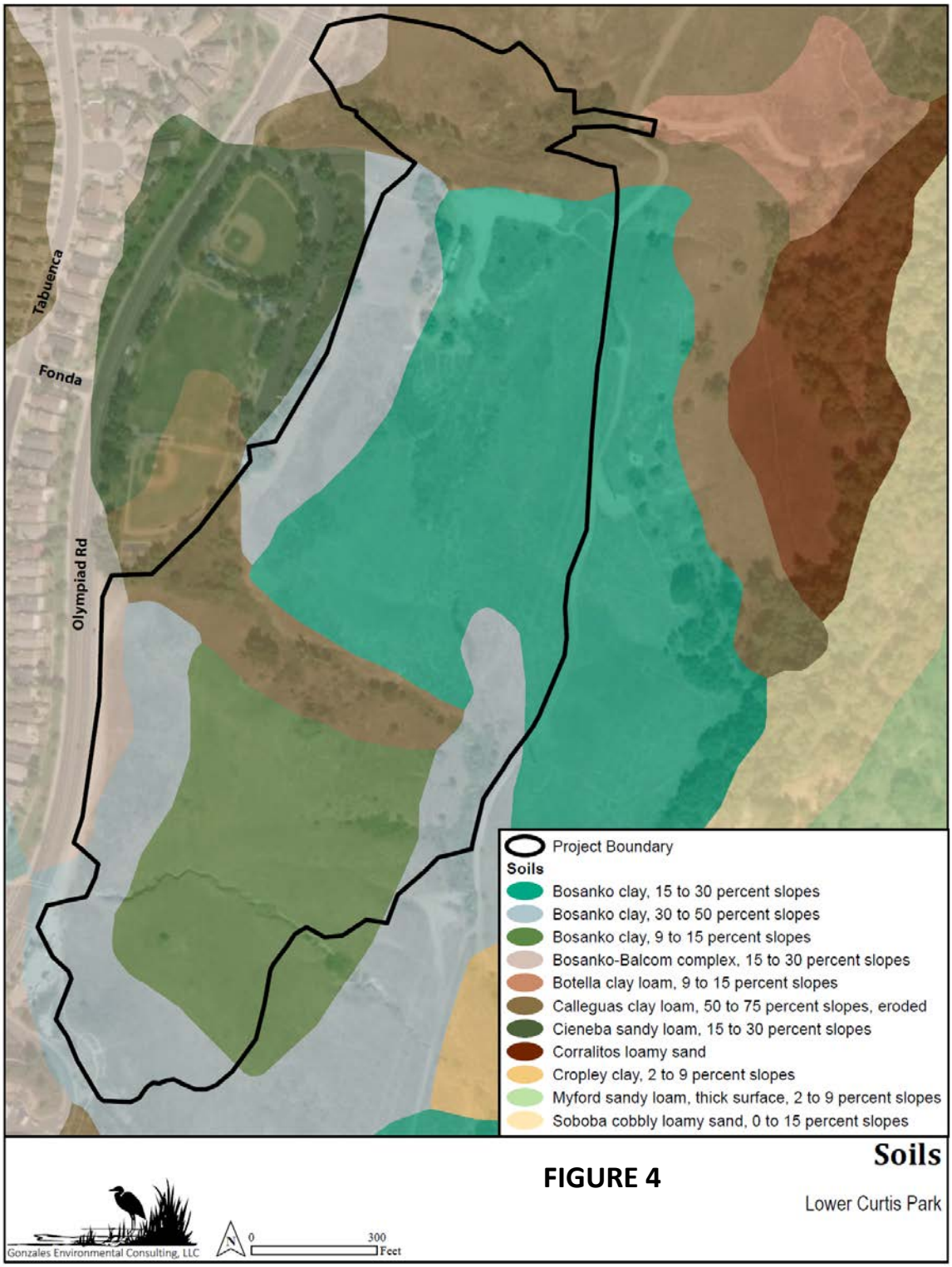


FIGURE 4

Soils

Lower Curtis Park

WETLANDS/STREAMBEDS

There are no wetlands on the project site. There are three anthropogenic created (overside drains from Olympiad Road) unnamed drainages (D-1, D-2 and D-3) on site. Flow is evident from channelization, darker soil within light soil, banking, etc.

Drainage 1 is located in the northern portion of the project site and begins with an over the side drainage inlet from Olympiad Road near the entrance to the Park. This drainage has native plants California fan palm (*Washingtonia filifera*), coast live oak (*Quercus agrifolia*), arroyo willow (*Salix lasiolepis*), and coyote bush (*Baccharis pilularis*) dominated by non-native species Mexican fan palm (*Washingtonia robusta*), and pampas grass (*Cortaderia jubata*). The drainage hydrologically connects to Arroyo Trabuco. Soils are consistent with mapping and contain clay loam.

Drainage 2 is a forked drainage with both forks starting at the edge of the park (one at the southeastern edge (T-1) and the other at the eastern edge of the landscape/maintenance area. This drainage contains primarily non-natives Artichoke thistle (*Cynara cardunculus*), Castor bean (*Ricinus communis*) and Black mustard (*Brassica nigra*) until reaching their confluence. Smaller sized Coast live oak trees are located in scattered areas in and around T-1. Once merged coast live oak, arroyo willow, lemonade berry (*Rhus integrifolia*) and stinging nettle (*Urtica dioica*) are the dominant species. The drainage hydrologically connects to Arroyo Trabuco. Soils in both forks of Drainage 2 consist of clay soils and are consistent with what is mapped.

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There are 0.315 acre of federal jurisdiction, and 7.74 acre of state jurisdiction. ***The drainage areas are potentially under the jurisdiction of the California Department of Fish and Game, U.S. Army Corps of Engineers and California Regional Water Quality Control Board. Permits/Agreements for activities within the streambed will be required by the California Department of Fish and Game, U. S. Army Corps of Engineers and California Regional Water Quality Control Board. Final authority over the area rests with the appropriate agencies.*** Please see attached Streambed Delineation Report (Appendix B) for more information.


Project Boundary
Project Impacts
Tarzona
Tabuenca
Fonda
Robert A
Curtis Park
Olympiad Rd
La Paz Rd
Felipe Rd
Site Plan
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

FIGURE 5

IV. FOCUS STUDY/SPECIES OF CONCERN

A. List from U.S. Fish and Wildlife Service (USFWS)/California Department of Fish and Wildlife (CDFW)

USFWS provided the following species:

Pacific Pocket Mouse	*Perognathus longimembris pacificus*	FE
California Least Tern	*Sterna antillarum browni*	FE
Coastal California Gnatcatcher	*Polioptila californica californica*	FT
Least Bell's Vireo	*Vireo bellii pusillus*	FE
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE
Arroyo (=arroyo Southwestern) Toad	*Anaxyrus californicus*	FE
Tidewater Goby	*Eucyclogobius newberryi*	FE
Riverside Fairy Shrimp	*Streptocephalus woottoni*	FE
San Diego Fairy Shrimp	*Branchinecta sandiegonensis*	FE
Big-leaved Crownbeard	*Verbesina dissita*	FT
Laguna Beach Liveforever	*Dudleya stolonifera*	FT
Thread-leaved Brodiaea	*Brodiaea filifolia*	FT

California Department of Fish and Wildlife (CDFW) provided the following species via California Natural Diversity Database (CNDDB). See Figure 6 and Table 2 below.

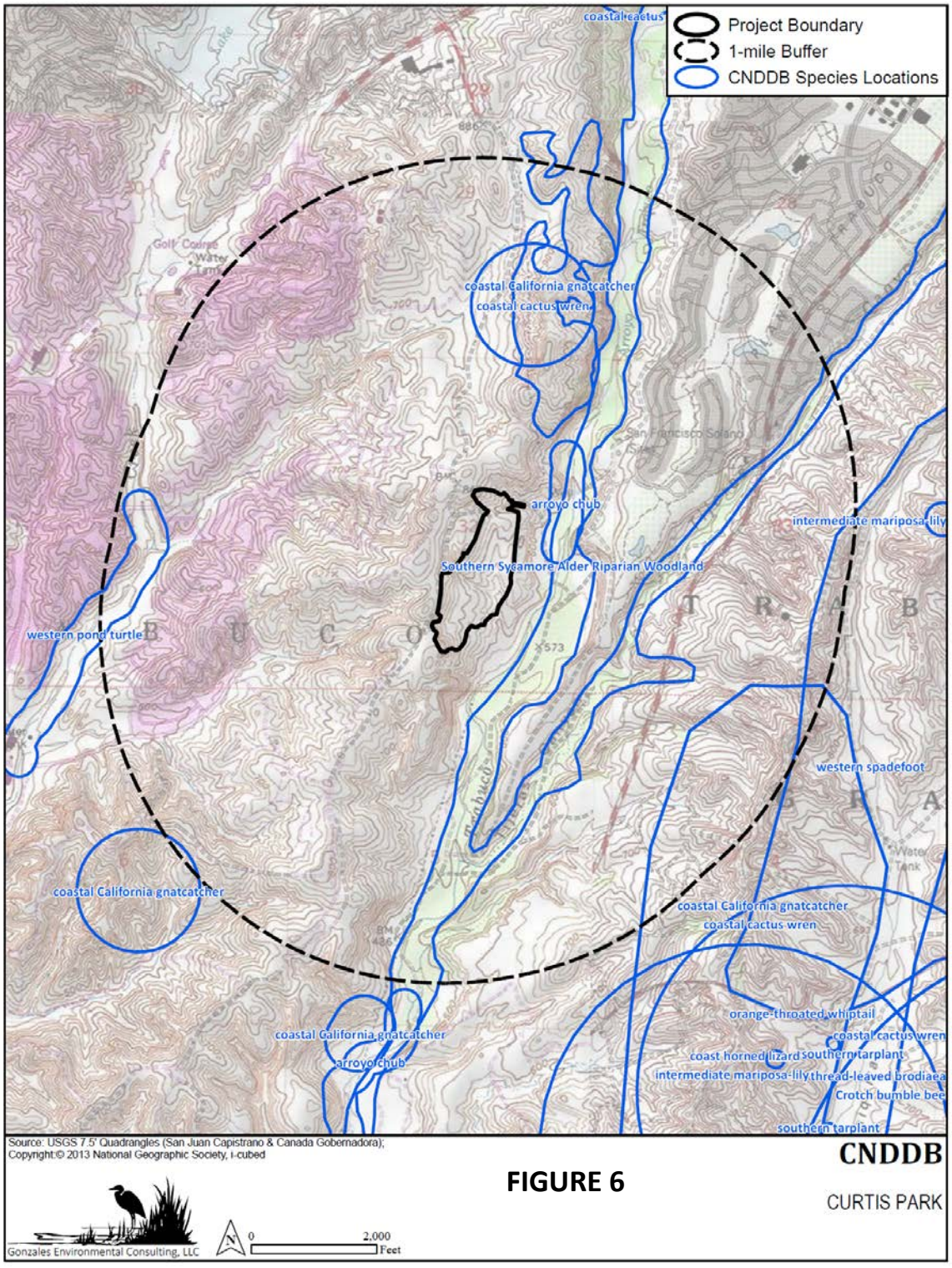

Project Boundary
1-mile Buffer
CNDDB Species Locations
coastal cactus
coastal California gnatcatcher
coastal cactus wren
arroyo chub
Southern Sycamore Alder Riparian Woodland
intermediate mariposa-lily
western pond turtle
western spadefoot
coastal California gnatcatcher
coastal California gnatcatcher
coastal cactus wren
orange-throated whiptail
coastal cactus wren
coast horned lizard
southern tarplant
intermediate mariposa-lily
thread-leaved brodiaea
Crotch bumble bee
coastal California gnatcatcher
arroyo chub
southern tarplant
Source: USGS 7.5' Quadrangles (San Juan Capistrano & Canada Gobernadora);
Copyright © 2013 National Geographic Society, i-cubed
Gonzales Environmental Consulting, LLC
0
2,000
Feet
CNDDB
CURTIS PARK

FIGURE 6

TABLE 2

CNDDB RARE, THREATENED OR ENDANGERED SPECIES AND HABITATS IN SAN JUAN CAPISTRANO QUADRANGLE[1]

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFG	CNPS
Anaxyrus californicus	arroyo toad	Endangered	None	SSC	-
Rana draytonii	California red-legged frog	Threatened	None	SSC	-
Spea hammondii	western spadefoot	None	None	SSC	-
Accipiter cooperii	Cooper's hawk	None	None	WL	-
Accipiter striatus	sharp-shinned hawk	None	None	WL	-
Aquila chrysaetos	golden eagle	None	None	FP ; WL	-
Circus hudsonius	northern harrier	None	None	SSC	-
Elanus leucurus	white-tailed kite	None	None	FP	-
Eremophila alpestris actia	California horned lark	None	None	WL	-
Cypseloides niger	black swift	None	None	SSC	-
Ardea alba	great egret	None	None	-	-
Ardea herodias	great blue heron	None	None	-	-
Egretta thula	snowy egret	None	None	-	-
Nycticorax nycticorax	black-crowned night heron	None	None	-	-
Charadrius montanus	mountain plover	None	None	SSC	-
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP	-
Progne subis	purple martin	None	None	SSC	-
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC	-
Icteria virens	yellow-breasted chat	None	None	SSC	-
Lanius ludovicianus	loggerhead shrike	None	None	SSC	-
Hydroprogne caspia	Caspian tern	None	None	-	-
Pandion haliaetus	osprey	None	None	WL	-
Baeolophus inornatus	oak titmouse	None	None	-	-
Setophaga petechia	yellow warbler	None	None	SSC	-
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	None	None	WL	-
Ammodramus savannarum	grasshopper sparrow	None	None	SSC	-
Phalacrocorax auritus	double-crested cormorant	None	None	WL	-
Polioptila californica californica	coastal California gnatcatcher	Threatened	None	SSC	-
Calypte costae	Costa's hummingbird	None	None	-	-
Selasphorus rufus	rufous hummingbird	None	None	-	-
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	None	None	SSC	-
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	Endangered	-	-
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered	-	-
Gila orcuttii	arroyo chub	None	None	SSC	-
Gasterosteus aculeatus microcephalus	resident threespine stickleback	None	None	-	-

1 NDDB 2016

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFG	CNPS	
Eucyclogobius newberryi	tidewater goby	Endangered	None	SSC	-	
Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	Endangered	None	-	-	
Danaus plexippus pop. 1	monarch - California overwintering population	None	None	-	-	
Chaetodipus californicus femoralis	Dulzura pocket mouse	None	None	SSC	-	
Eumops perotis californicus	western mastiff bat	None	None	SSC	-	
Nyctinomops femorosaccus	pocketed free-tailed bat	None	None	SSC	-	
Antrozous pallidus	pallid bat	None	None	SSC	-	
Myotis yumanensis	Yuma myotis	None	None	-	-	
Anniella stebbinsi	southern California legless lizard	None	None	SSC	-	
Arizona elegans occidentalis	California glossy snake	None	None	SSC	-	
Diadophis punctatus modestus	San Bernardino ringneck snake	None	None	-	-	
Diadophis punctatus similis	San Diego ringneck snake	None	None	-	-	
Emys marmorata	western pond turtle	None	None	SSC	-	
Thamnophis hammondii	two-striped gartersnake	None	None	SSC	-	
Phrynosoma blainvillii	coast horned lizard	None	None	SSC	-	
Aspidoscelis hyperythra	orange-throated whiptail	None	None	WL	-	
Aspidoscelis tigris stejnegeri	coastal whiptail	None	None	SSC	-	
Crotalus ruber	red-diamond rattlesnake	None	None	SSC	-	
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	None	None	-	-	
Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	None	None	-	-	
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	None	None	-	-	
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	None	None	-	1B.1	
Deinandra paniculata	paniculate tarplant	None	None	-		4.2
Malacothrix saxatilis var. *saxatilis*	cliff malacothrix	None	None	-		4.2
Pentachaeta aurea ssp. *allenii*	Allen's pentachaeta	None	None	-	1B.1	
Pseudognaphalium leucocephalum	white rabbit-tobacco	None	None	-	2B.2	
Verbesina dissita	big-leaved crownbeard	Threatened	Threatened	-	1B.1	
Harpagonella palmeri	Palmer's grapplinghook	None	None	-		4.2
Atriplex coulteri	Coulter's saltbush	None	None	-	1B.2	
Convolvulus simulans	small-flowered morning-glory	None	None	-		4.2
Dichondra occidentalis	western dichondra	None	None	-		4.2
Dudleya multicaulis	many-stemmed dudleya	None	None	-	1B.2	
Dudleya stolonifera	Laguna Beach dudleya	Threatened	Threatened	-	1B.1	
Comarostaphylis diversifolia ssp. *diversifolia*	summer holly	None	None	-	1B.2	
Euphorbia misera	cliff spurge	None	None	-	2B.2	
Quercus dumosa	Nuttall's scrub oak	None	None	-	1B.1	
Calochortus catalinae	Catalina mariposa-lily	None	None	-		4.2
Calochortus weedii var. *intermedius*	intermediate mariposa-lily	None	None	-	1B.2	
Hordeum intercedens	vernal barley	None	None	-		3.2
Polygala cornuta var. *fishiae*	Fish's milkwort	None	None	-		4.3
Lycium californicum	California box-thorn	None	None	-		4.2

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFG	CNPS
Brodiaea filifolia	thread-leaved brodiaea	Threatened	Endangered	-	1B.1

Legend:
Candidate= Candidate for listing
CNDDB=California Natural Diversity Database
CDFW=California Department of Fish and Wildlife
FP=Fully Protected
SSC=Species of Concern
CNPS List= California Native Plant Society
CNPS 1B= Rare or Endangered In California and Elsewhere
CNPS 2= Rare or Endangered in California, More Common Elsewhere
CNPS 3= Need More Information
CNPS 4= Plants of Limited Distribution
CNPS New Threat Code extensions and their meanings:
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

B. Literature Review

Prior to conducting the field portion of the assessment, we queried the California Department of Fish and Wildlife California Natural Diversity Data Base (CNDDB) to determine the special-status species that have been documented in the San Juan Capistrano quadrangle. Additional data regarding the potential occurrence of special-status species were gathered from the following sources:

- Topographic maps (USGS 7.5 minute quadrangle)
- Aerial photos
- California Natural Diversity Database (CDFW 2019)
- USFWS sensitive species occurrence database (USFWS 2019)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2019)
- IPaC (USFWS 2019)
- Orange County and Western Riverside Area, California Soil Survey (U.S. Department of Agriculture [USDA] 1973)
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/) Orange County and Part of Riverside County, California (CA678) Spatial Data

D. Consultation with Experts on Species/Agencies

California Department of Fish and Game, Region 5 (South Coast Region) was contacted regarding species.

U.S. Fish and Wildlife Service, Carlsbad Field Office was contacted regarding species in the project area (please see attached letter).

V. METHODOLOGY

Biological Surveys

Baseline biological studies of the proposed project were conducted in September 2019. Existing biological data was collected using Personal Computers (PCs) and Geographic Positioning System (GPS). This allowed for data to be collected in real time. Data layers uploaded onto these PCs included recent aerial photography, and topographic contours. Biological data was mapped onto the aerial photograph layers as polygon, line, and point attributes.

Checklists of biological information were uploaded onto the PCs, which allowed us to accurately label all data points, ensure consistency, and keep a running electronic account of all species encountered during the surveys. Finally, these checklists allowed for the inclusion of supplemental field notes, most notably, ranking of the quality of the various habitats including dominant and associate species for each vegetation polygon; assessing habitats for the potential presence of sensitive species not observed during the surveys; and identifying areas that would require protocol-level sensitive species surveys (i.e., USFWS protocol-level surveys for federal threatened and endangered species.

Habitats for specific species of wildlife and plants identified during surveys were classified as: not expected, low, moderate, high, or expected. These classifications were based on the quality of the habitat for each species and the proximity of the habitat to a known occurrence of a species obtained from CNDDB data. The definitions of each of the classifications are as follows:

Not Expected: Species not previously reported in the vicinity of the site, and suitable habitat very marginal due to disturbances, fragmentation, and/or isolation.

Low: Species previously reported from the vicinity of the site, but suitable habitat is marginal due to disturbances, fragmentation, and/or isolation.

Medium: Species previously reported from the vicinity of the site, and large areas of contiguous high-quality habitat present; or species previously reported in the vicinity of the site, but suitable habitat quality is moderate due to disturbances, fragmentation, and/or isolation.

High: Species previously reported from regional vicinity of the site, and large areas of contiguous high-quality habitat are present.

Expected: Species previously reported from very close vicinity of the site, and large areas of contiguous high-quality habitat are present.

Vegetation Methods

Aerial photography and digital vegetation maps were reviewed to determine potential community types within the project area. Preliminary ground-truthing surveys concurred with digital vegetation maps, and additional surveys were performed to accurately define the community types and boundaries.

Wetlands and Aquatic Resources Methods

General aquatic resource assessments of the proposed project site were conducted which included general mapping of habitat(s) that may be subject to jurisdiction of the ACOE pursuant to section 404 of the Clean Water Act and the CDFW pursuant to sections 1600-12 of the California Fish and Game Code.

A brief assessment of the streambed jurisdictional communities encountered was also conducted which described the dominant and associate plant species of each community and the presence and/or absence of visual field indicators (e.g., dominance of hydrophytic species, presence of drift lines).

Wildlife Survey and Habitat Assessment Methods

General reconnaissance and habitat assessment surveys were completed to determine habitat suitability for listed species and special status plant, wildlife, and aquatic species. Suitable habitat for listed species and special status species was determined by the presence of specific habitat elements. The surveys coincided with the period during which many wildlife species, including migratory species, would have been most detectable. A faunal inventory of all species observed during the course of the surveys was also prepared.

Special Status Species Methods

Special Status Rare Plant Species Survey Methods

Information on special status rare plant species within the project area was gathered from several sources including California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2019), CNDDB (CNDDB 2019), and CalFlora (CalFlora 2019). Maps depicting all known sensitive plant species locations within the project area were produced to aid in determining the target species for survey. General reconnaissance and habitat assessment surveys were completed in 2019 to determine habitat suitability for listed species and special status plants. Suitable habitat for listed species and special status species was determined by the presence of specific habitat elements.

Plant surveys of the project area were conducted in September 2019. This time period does not correspond to the time during which most ephemeral spring annuals and herbaceous perennials, especially sensitive plant species, in Orange County would be most detectable. Since the project site has been impacted by anthropogenic activities the timing of surveys is not thought to be moderately pertinent. No sensitive plant species were located. The likelihood of these species occurrence (expected, high, moderate, low, or not expected) was also

assessed. A floral inventory of all species observed during the course of the surveys was also documented.

Special Status Wildlife Species Survey Methods

Prior to conducting habitat assessment surveys, CNDDB and other sources were reviewed for the records of special status wildlife species potentially occurring in the project area. General reconnaissance and habitat assessment surveys were conducted to assess the presence of special status wildlife species habitats within the project area. Maps depicting all known sensitive wildlife species locations within the regional vicinity of the project were produced to aid in determining the target species to survey. All wildlife species encountered during surveys were documented. Any specific areas (e.g., potential nesting, breeding, and foraging habitat) encountered during the surveys that have a high probability for supporting sensitive wildlife were documented. The likelihood of these species occurrence (not expected, low, moderate, high, expected) was also assessed. General habitat assessments for other species were also conducted. General habitat assessments involved evaluating the specific vegetation communities encountered and their potential to support these sensitive species (expected, high, moderate, low, not expected).

Surveys

A complete floristic survey of the project area, as required in a complete CEQA analysis, was conducted in September 2019 to determine whether listed or special status plant species or sensitive plant communities occur. No listed plants are known to occur within the immediate area.

Transects for general reconnaissance and habitat assessment surveys were conducted to assess the presence of special status wildlife and plant species habitats within the project area. Please see Figure 7. Survey information is included in Table 3.

Weather during the surveys was as follows:

TABLE 3
SURVEY SUMMARY 2019

Date	Air Temp (F)	Wind Speed	Cloud Cover	Precipitation	Duration
September 8	64/76	6-11	0-75% marine layer	None	5 hrs
September 15	67/85	3-8	0-40% cloud cover	None	5 hrs
September 22	64/82	1-7	0-30% cloud cover	None	5 hrs
October 6	55/86	0-6	Clear	None	5 hrs


Escatron
Tarzona
Tabuenca
Fonda
Robert A
Curtis Park
Olympiad Rd
La Paz Rd
Felipe Rd
Project Boundary
Survey Transects (10-meter)
150-meter Buffer Transect
Transects
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
400
Feet

FIGURE 7

VI. GENERAL BIOLOGICAL SURVEY RESULTS

A. Plant associations

Native vegetation adjacent to the project area is best characterized as *Baccharis pilularis* Alliance, *Baccharis salicifolia*, *Isocoma menziesii* Alliance, *Nicotiana glauca*, *Quercus agrifolia* Alliance, Non-native *Cynara cardunculus* Alliance, Non-native grassland, disturbed habitat, and developed/landscape. The locations of the native plant communities within the project footprint have been impacted by anthropogenic activities in the area. The existing plant communities are described in more detail below.

Baccharis pilularis Alliance

Plants occur as a dominant or co-dominant in a number of shrubland alliances in California and make up the *Baccharis pilularis* shrubland alliance when they are > 50% of the shrubland's absolute cover (Sawyer et al. 2009). The shrubs tend to be in the more early seral stages of forest vegetation development in the north than in the south. In northern CA and OR, plants can be a dominant in various scrub plant communities on coastal bluffs, in coastal prairies, and oak woodlands, but less frequent on coastal dunes. In southern CA, plants tend to be less dominant members of coastal sage scrub and grassland communities but can dominate patches of vegetation in particular microsites (Steinberg 2002). In southern CA shrublands, plants may sometimes be co-dominant with *Artemisia californica*, *Salvia mellifera* , or *Lotus scoparius* var. *scoparius*.

Baccharis salicifolia

Baccharis salicifolia is a flowering shrub native to the desert southwest of the United States and northern Mexico, as well as parts of South America. Its usual common name is mule fat; it is also called seepwillow or water-wally. This is a large bush with sticky foliage which bears plentiful small, fuzzy, pink or red-tinged white flowers. The long pointed leaves may be toothed. It is most common near water sources. On the project site *Baccharis salicifolia* exists as monotypic patches. Monotypic patches were mapped separately.

Isocoma menziesii Alliance

Menzies' goldenbush scrub (Gray and Bramlett 1992) is a plant association which is dominated by coastal goldenbush *(Isocoma menziesii* var. *menziesii*). It is not a plant community identified in Holland (1986) and would typically be included in the California sage scrub community for mapping purposes. It has been separated from California sage scrub in this report because it supports nearly monotypic patches of coastal goldenbush and appears on the slope above part of Drainage 2. In this instance, it intergrades with non-native grasslands. The *Isocoma menziesii* var. *menziesii* (Menzies goldenbush scrub) alliance has a rank of G4-S4-1 in CDFW (2019), meaning that it is apparently

secure both globally and within the state but that more data is needed to confirm. Because this alliance is considered a sub-association of California sagebrush scrub, which is the obligate habitat type for the federally listed threatened California gnatcatcher, it is considered a special-status vegetation community.

Nicotiana glauca

Nicotiana glauca (tree tobacco) is a tree/shrub (family Solanaceae), which stands 10-20 feet tall and is short-lived. Tree tobacco was introduced to California about 100 years ago and is found growing up to 5,000 feet in disturbed soils, vacant lots, along roadsides, streamsides, and other riparian areas. On the project site *Nicotiana glauca* exists as monotypic patches and on edges of *Quercus agrifolia* Alliance. Monotypic patches were mapped separately.

Quercus agrifolia Alliance

Habitat dominated by one tree, coast live oak (*Quercus agrifolia*), which is evergreen and reaches 10-25 meters in height. The shrub layer is poorly developed, but may include poison oak, elderberry, and sugar bush. The herb component is continuous and dominated by introduced taxa. Typically found on north facing slopes and shaded ravines in the south (Holland). This habitat dominates the lower aspects of Drainage 1, 2 and 3.

Non-native *Cynara cardunculus* Alliance

Cynara cardunculus (artichoke thistle) is a large perennial thistle (family Asteraceae) found below 500 meter elevations throughout California, except in the Great Basin and Desert Regions. Artichoke thistle prefers disturbed open sites, including grassland, chaparral, coastal scrub, and riparian areas. This habitat dominates the upper aspects of Drainage 2 and 3 and aspects below developed park area.

Non-native grassland

California annual grassland is characterized by a mixture of weedy, introduced annuals, primarily grasses. It may occur where disturbance by maintenance (mowing, scraping, discing, spraying, etc.), repetitive fire, agriculture, or other mechanical disruptions have altered soils and removed native seed sources from areas formerly supporting native vegetation. Holland (1986) states that California annual grasslands have a sparse to dense cover of annual grasses that are typically 0.2–0.5 meter (0.7–1.6 feet) tall and can be up to 1 meter (3 feet) tall. Wildflowers are often associated with California annual grasslands, especially in years with favorable precipitation (Holland 1986). According to Holland (1986) and the List of Terrestrial Natural Communities (CDFG 2003), grasses that occur in California annual (non-native) grasslands include oats (*Avena* spp.), bromes(*Bromus* spp.), fescue (*Vulpia* spp.), and Italian ryegrass (*Lolium perenne* ssp. *multiflorum*). Forbs that occur with these grasses include California poppy (*Eschscholzia californica*), filaree (*Erodium* spp.), goldfields (*Lasthenia* spp.), phacelia (*Phacelia* spp.), gilias (*Gilia* spp.), and baby blue-eyes

(*Nemophila menziesii*). California annual (non-native) grassland also includes land that is used as pasture for grazing purposes. Grasses such as barley (*Hordeum* spp.) and wild oats (*Avena* sp.) may grow in these areas. This land has very few native species. In his description of California annual (non-native) grassland, Holland (1986) states that this habitat type typically occurs on fine-textured clay soils. Sites are often moist or waterlogged during the winter rainy season and very dry during the summer and fall months. Adjacent areas with moister, better-drained soils often support oak woodland. According to Sawyer and Keeler-Wolf (1995), California annual (non-native) grasslands occur in uplands of all topographic orientation. On the project site it is the dominant habitat.

Disturbed

Disturbed land includes areas that experience or have experienced high levels of human disturbance unpaved roads, trails, and graded areas. Vegetation in these areas, if present at all, is usually sparse and dominated by non-native weedy herbaceous species. Within the study area, disturbed land includes trails and bare, open areas with less than 20% vegetative cover. Disturbed land is not included in the List of California Vegetation Alliances and Associations (CDFW 2019). This community is not considered a special-status vegetation community. The disturbed area on the project site encompasses the existing park, roads and utility areas.

Developed/Landscaped

Areas mapped as developed/landscaped include planted areas where ornamental landscaping has been installed as part of a recreational park, development, or roadway landscaping. Developed/landscaped is not included in the List of California Vegetation Alliances and Associations (CDFW 2019). Since it is dominated by non-native ornamental plantings, developed/landscaped land has limited value and is not considered a special-status vegetation community.

TABLE 4
SUMMARY OF HABITAT TYPE AND PROJECT ACREAGE

Vegetation	Boundary
Baccharis pilularis Alliance	0.009
Baccharis salicifolia	0.068
Developed/Landscape	2.078
Disturbed Habitat	1.250
Isocoma menziesii Alliance	0.261
Nicotiana glauca	0.226
Non-native *Cynara cardunculus* Alliance	2.465
Non-native Grassland	31.678
Quercus agrifolia Alliance	5.124
TOTAL (acres)	**43.159**

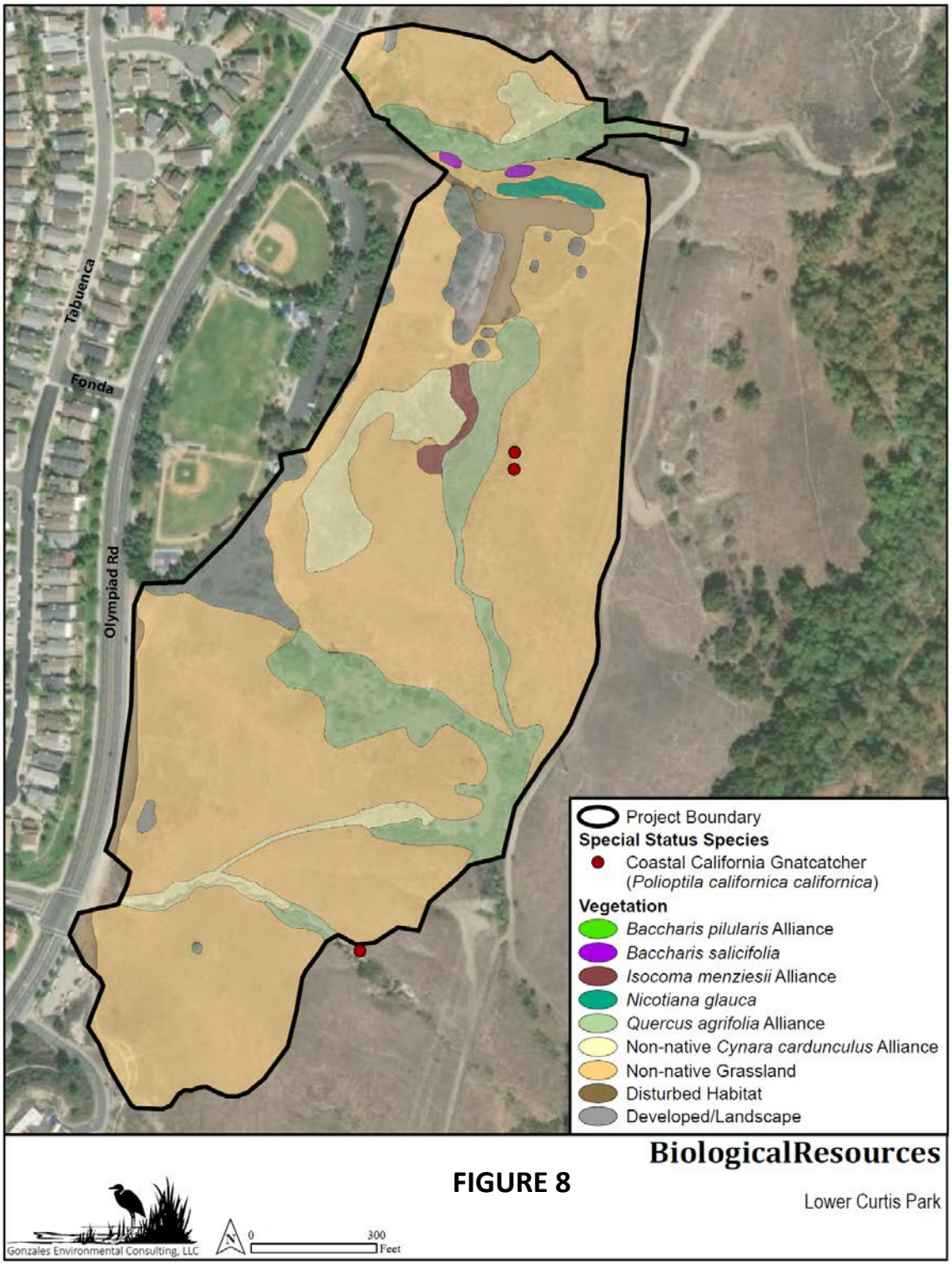

Tabuenca
Fonda
Olympiad Rd
Project Boundary
Special Status Species
Coastal California Gnatcatcher
(Polioptila californica californica)
Vegetation
Baccharis pilularis Alliance
Baccharis salicifolia
Isocoma menziesii Alliance
Nicotiana glauca
Quercus agrifolia Alliance
Non-native Cynara cardunculus Alliance
Non-native Grassland
Disturbed Habitat
Developed/Landscape
BiologicalResources
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

FIGURE 8

TABLE 5

PLANTS OBSERVED ON THE PROJECT SITE

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
ADOXACEAE			
Sambucus nigra ssp. *caerulea*	Blue elderberry	U	Native
AMARANTHACEAE			
Amaranthus albus	Tumbleweed	U	Non-Native
ANACARDIACEAE			
Rhus integrifolia	Lemonade berry	U	Native
Schinus molle	California pepper tree	C	Non-Native
ASTERACEAE			
Ambrosia psilostachya	Ragweed	U	Native
Artemisia californica	California sagebrush	U	Native
Artemisia douglasiana	California mugwort	U	Native
Artemisia dracunculus	Tarragon	U	Native
Baccharis pilularis	Coyote bush	C	Native
Baccharis salicifolia	Mulefat	C	Native
Brickellia californica	California brickellbush	U	Native
Corethrogyne filaginifolia	Common sandaster	U	Native
Carduus pycnocephalus	Italian thistle	U	Non-Native
Cynara cardunculus	Artichoke thistle	C	Non-Native
Centaurea melitensis	Tocalote	C	Non-Native
Erigeron foliosus	Leafy daisy	U	Native
Erigeron canadensis	Canada horseweed	U	native
Eriophyllum confertiflorum	Golden yarrow	U	Native
Matricaria discoidea	Pineapple weed	C	Native
Grindelia camporum	Gumweed	U	Native
Helianthus gracilentus	Slender sunflower	U	Native
Heterotheca grandiflora	Telegraph weed	U	Native
Isocoma menziesii	Menzie's goldenbush		
Porophyllum gracile	Odora	U	Native
Pseudognaphalium californicum	Ladies' tobacco	U	Native
Pseudognaphalium microcephalum	Feltleaf everlasting	U	Native
Silybum marianum	Milk thistle	U	Non-Native

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
Sonchus asper	Spiny sowthistle	U	Non-Native
Sonchus oleraceus	Sowthistle	U	Non-Native
Oncosiphon piluliferum	Stinknet	C	Non-Native
Stephanomeria diegensis	Wreathplant	C	Native
Osmadenia tenella	False rosinweed	U	Native
Lactuca serriola	Prickly lettuce	U	Non-Native
Logfia gallica	Narrowleaf cottonrose	U	Non-Native
Rafinesquia californica	California chicory	U	Native
Solidago velutina	Threenerve goldenrod	U	Native
Taraxicum officionale	Dandelion	C	Non-Native
Xanthium strumarium	Rough cocklebur	C	Native
BRASSICACEAE			
Brassica nigra	Black mustard	U	Non-Native
Hirschfeldia incana	Short podded mustard	C	Non-Native
Sinapis arvensis	Charlock	U	Non-Native
CHENOPODIACEAE			
Kochia scoparia	Summer cypress	U	Non-native
Salsola tragus	Russian thistle	C	Non-native
EUPHORBIACEAE			
Euphorbia albomarginata	Rattlesnake sandmat	C	Native
Croton setigerus	Turkey mullein	C	Native
Ricinus communis	Castor bean	C	Non-Native
GERANIACEAE			
Erodium cicutarium	Coastal Heron's Bill	A	Non-Native
CACTACEAE			
Cylindropuntia californica	California cholla	U	Native
Opuntia littoralis	Coast prickly pear	U	Native
FAGACEAE			
Quercus agrifolia	Coast live oak	U	Native
OLEACEAE			
Olea europaea	Olive shrub	C	Non-Native
PLANTAGINACEAE			
Plantago erecta	California plantain	U	Native
POLYGONACEAE			
Eriogonum fasciculatum	California buckwheat	C	Native
RHAMNACEAE			
Frangula californica	California coffeeberry	U	Native

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
RUBIACEAE			
Galium parisiense	Wall bedstraw	U	Non-Native
SALICACEAE			
Salix lasiolepis	Arroyo willow	U	Native
SOLANACEAE			
Datura wrightii	Jimsonweed	U	Native
Nicotiana glauca	Tree tobacco	C	Non-Native
TAMARICACEAE			
Tamarix ramosissima	Salt cedar	U	Non-Native
URTICACEAE			
Urtica dioica	Stinging nettle	C	Native
Urtica urens	Dwarf nettle	U	Non-Native
ZYGOPHYLLACEAE			
Tribulus terrestris	Puncture vine	U	Non-Native
ARECACEAE			
Washingtonia robusta	Mexican fan palm	U	Non-Native
ASPARAGACEAE			
Yucca gloriosa	Spanish dagger	U	Non-Native (landscape)
Yucca filamentosa	Adam's needle	U	Non-Native (landscape)
POACEAE			
Avena barbata	Slender Wild Oat	C	Non-Native
Avena fatua	Wild Oat	U	Non-Native
Bromus diandrus	Ripgut brome	C	Non-Native
Bromus hordeaceus	Soft Chess	C	Non-Native
Bromus madritensis ssp. rubens	Foxtail Chess	U	Non-Native
Cortaderia jubata	Pampas grass	U	Non-Native

Legend:

* *AbundanceDefinitions*
A=Abundant: observed or expected to occur in substantial numbers (>500 observations) in suitable habitat and in the appropriate season;
C=Common: observed or expected to occur in high numbers (100-500 observations) in suitable habitat and in the appropriate season;
u=Uncommon: observed or expected to occur in low numbers (10-100 observations) in suitable habitat and in the appropriate season; may be restricted to few habitat types;
R=Rare: observed or expected to occur in very low numbers (<10 observations) in suitable habitat and in the appropriate season; restricted to specific habitat types

**Special Status Plant

TABLE 6
AVIAN SPECIES OBSERVED ON THE PROJECT SITE

SCIENTIFIC NAME	COMMON NAME	SPECIAL STATUS/REGIONAL STATUS	NATIVE SPECIES	OBSERVATION TYPE	POPULATION SIZE (OBSERVED #/# OF VISITS)[2]
AVES	**BIRDS**				
ACCIPITRIDAE	**HAWK**				
Buteo jamaicensis	Red-tailed Hawk	No	Yes	Visual	2
FALCONIDAE	**FALCON**				
Falco sparverius	American kestrel	No	Yes	Visual	1
COLUMBIDAE	**PIGEONS AND DOVES**				
Streptopelia decaocto	Eurasian Collared Dove	No	No	Visual	3
Zenaida macroura	Mourning Dove	No	Yes	Visual	8
CUCULIDAE	**CUCKOOS AND ROADRUNNERS**				
Geococcyx californianus	Greater roadrunner	No	Yes	Visual	1
CORVIDAE	**CROWS & JAYS**				
Corvus corax	Common raven	No	Yes	Visual	6
Corvus brachyrhynchos	American crow	No	Yes	Visual	2
TROGLODYTIDAE	**WRENS**				
Troglodytes bewickii	Bewick's wren	No	Yes	Visual	1
TROCHILIDAE	**HUMMINGBIRD**				
Calypte anna	Anna's Hummingbird	No	Yes	Visual	4
HIRUNDINIDAE	**SWALLOWS**				
Stelgidopteryx serripennis	Northern Rough-winged swallow	No	Yes	Visual	4
PICIFORMES	**WOODPECKER**				
Melanerpes formicivorus	Acorn Woodpecker	No	Yes	Visual	2
AEGITHALIDAE	**BUSHTITS**				
Psaltriparus minimus	Bushtit	No	Yes	Visual	10
FRINGILLIDAE	**FINCHES**				
Carpodacus mexicanus	House finch	No	Yes	Visual	5
POLIOPTILIDAE	**GNATCATCHER**				
Polioptila californica californica	Coastal California gnatcatcher	Yes FT	Yes	Visual	3
MIMIDAE	**MIMIC THRUSHES, OR MIMIDS**				
Mimus polyglottos	Northern Mockingbird	No	Yes	Visual	4
SYLVIIDAE	**WARBLERS AND PARROTBILL**				
Chamaea fasciata	Wrentit	No	Yes	Visual	1
STURNIDAE	**STARLINGS**				
Sturnus vulgaris	European starling	No	No	Visual	3
EMBERIZIDAE	**SPARROWS AND TOWHEES**				
Melozone crissalis	California towhee	No	No	Visual	3
Melospiza melodia	Song sparrow	No	No	Visual	2
PASSERELLIDAE	**OLD WORLD SPARROWS**				
Passer domesticus	House Sparrow	No	No	Visual	2

Legend:
CDFW=California Department of Fish and Wildlife
SSC=California Species of Concern
FP=Fully Protected
WL=Audubon watch list
FT=Federal Threatened

[2] Population size determined by the following formula: number of species divided by number of visits

TABLE 7

AMPHIBIAN & REPTILE SPECIES OBSERVED ON THE PROJECT SITE

SCIENTIFIC NAME	COMMON NAME	SPECIAL STATUS/REGIONAL STATUS	NATIVE SPECIES	OBSERVATION TYPE	POPULATION SIZE (OBSERVED #/# OF VISITS)[3]
Hylidae	**Tree Frog**				
Pseudacris hypochondriaca	Baja California Tree Frog	No	Yes	Visual	1
Anguidae	**Alligator Lizard**				
Elgaria multicarinata	Southern Alligator Lizard	No	Yes	Visual	3
Phrynosomatidae	**Side-blotch Lizard**				
Uta stansburiana	Common Side-blotched Lizard	No	Yes	Visual	2
Sceloporus occidentalis	Western Fence Lizard	No	Yes	Visual	3
Colubridae	**Gopher Snake**				
Pituophis catenifer	Gopher Snake	No	Yes	Visual	1
Lampropeltis californiae	California King Snake	No	Yes	Visual	1
Viperidae	**Vipers**				
Crotalus oreganus	Western Rattlesnake	No	Yes	Visual	1

[3] Population size determined by the following formula: number of species divided by number of visits

TABLE 8
MAMMAL SPECIES OBSERVED ON THE PROJECT SITE

Scientific Name	Common Name	Special Status/Regional Status	Native Species	OBSERVATION TYPE/EXPECTATION TO OCCUR*	Population Size (observed #/# of visits)[4]
FAMILY LEPORIDAE	**RABBITS & HARES**				
Sylvilagus audubonii	Desert cottontail	No	Native	Visual	1
FAMILY SCIURIDAE	**GROUND SQUIRREL**				
Otospermophilus beecheyi	California ground squirrel	No	Native	Visual	2
FAMILY CERVIDAE	**MULE DEER**				
Odocoileus hemionus	Mule deer	No	Native	Visual	1
FAMILY CANIDAE	**DOG, WOLF & FOX**				
Canis latrans	Coyote	No	Native	Visual	1
Canis familiaris	Dog	No	Non-Native	Visual	3
FAMILY FELIDAE	**CAT**				
Felis domesticus	Cat	No	Non-Native	Visual	3

[4] Population size determined by the following formula: number of species divided by number of visits

VII. RARE, ENDANGERED OR SENSITIVE SPECIES AND HABITATS RESULTS

According to the CNDDB, no special-status species have been documented on the proposed project site (Rarefind 5 2019). However, five special-status species have been documented within one mile of project site in the San Juan Capistrano quadrangle (See Figure 9 and Table 9). Under current conditions the project would not have any significant impacts to rare, endangered or sensitive plants. In the subsections below we list the special-status species that have been documented in the San Juan Capistrano quadrangle and we discuss each species' potential to occur on the project site.

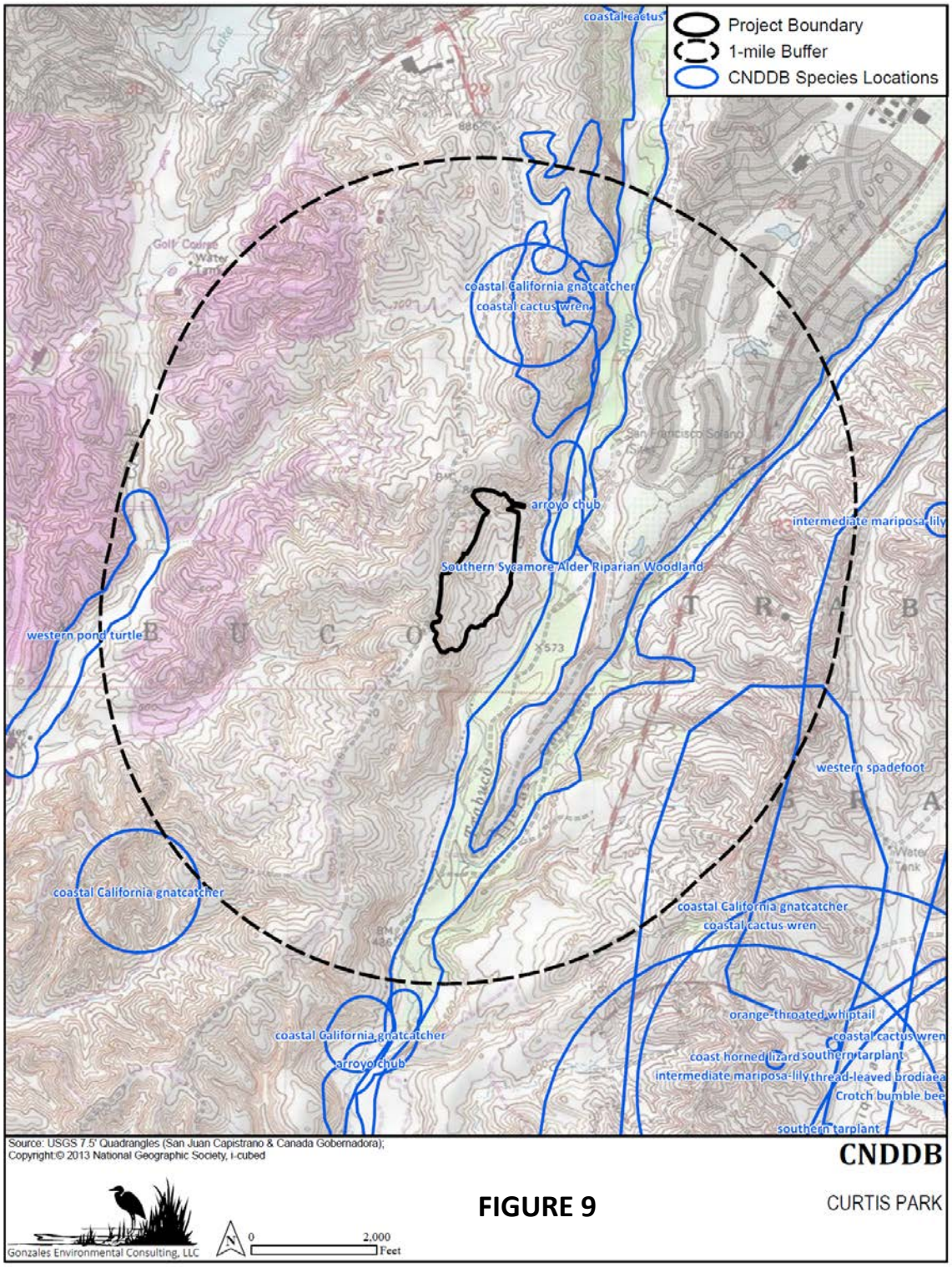

Project Boundary
1-mile Buffer
CNDDB Species Locations
coastal cactus
coastal California gnatcatcher
coastal cactus wren
arroyo chub
Southern Sycamore Alder Riparian Woodland
intermediate mariposa lily
western pond turtle
western spadefoot
coastal California gnatcatcher
coastal California gnatcatcher
coastal cactus wren
orange-throated whiptail
coastal cactus wren
coast horned lizard
southern tarplant
intermediate mariposa-lily
thread-leaved brodiaea
Crotch bumble bee
coastal California gnatcatcher
arroyo chub
southern tarplant
Source: USGS 7.5' Quadrangles (San Juan Capistrano & Canada Gobernadora);
Copyright © 2013 National Geographic Society, i-cubed
Gonzales Environmental Consulting, LLC
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Feet
CNDDB
CURTIS PARK

FIGURE 9

TABLE 9

CNDDB SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS SPECIES WITHIN ONE MILE

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW	CNPS
Emys marmorata	western pond turtle	None	None	SSC	
Gila orcuttii	arroyo chub	None	None	SSC	
Polioptila californica californica	coastal California gnatcatcher	T	None	SSC	
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	None	None		
Spea hammondii	western spadefoot	None	None	SSC	

Legend:
CDFG=California Department of Fish and Game
CNPS List= California Native Plant Society
C=Candidate
E=Endangered
T=Threatened
WL=Watchlist
FP=Fully Protected
SSC=Species of Special Concern
CNPS 1B= Rare or Endangered In California and Elsewhere
CNPS 2=Plants rare, threatened, endangered in California, more common elsewhere
CNPS 3= Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported
CNPS 4=Plants of limited distribution
New Threat Code extensions and their meanings:
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

Sensitive Habitat

Southern Sycamore Alder Riparian Woodland is listed by the California Department of Fish and Wildlife as a sensitive habitat. We found no Southern Sycamore Alder Riparian Woodland on the project site.

Plants

We did not detect any special-status plant species during our surveys. In the subsequent text, we list special-status plant species documented within the San Juan Capistrano quadrangle, and we discuss each species' possibility of occurring at the project site.

TABLE 10

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS PLANT SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW	CNPS
Pentachaeta aurea ssp. *allenii*	Allen's pentachaeta	None	None	-	1B.1
Verbesina dissita	big-leaved crownbeard	Threatened	Threatened	-	1B.1
Lycium californicum	California box-thorn	None	None	-	4.2
Calochortus catalinae	Catalina mariposa-lily	None	None	-	4.2
Malacothrix saxatilis var. *saxatilis*	cliff malacothrix	None	None	-	4.2
Euphorbia misera	cliff spurge	None	None	-	2B.2
Atriplex coulteri	Coulter's saltbush	None	None	-	1B.2
Polygala cornuta var. *fishiae*	Fish's milkwort	None	None	-	4.3
Calochortus weedii var. *intermedius*	intermediate mariposa-lily	None	None	-	1B.2
Dudleya stolonifera	Laguna Beach dudleya	Threatened	Threatened	-	1B.1
Dudleya multicaulis	many-stemmed dudleya	None	None	-	1B.2
Quercus dumosa	Nuttall's scrub oak	None	None	-	1B.1
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	None	None	-	1B.1
Harpagonella palmeri	Palmer's grapplinghook	None	None	-	4.2
Deinandra paniculata	paniculate tarplant	None	None	-	4.2
Convolvulus simulans	small-flowered morning-glory	None	None	-	4.2
Comarostaphylis diversifolia ssp. *diversifolia*	summer holly	None	None	-	1B.2
Brodiaea filifolia	thread-leaved brodiaea	Threatened	Endangered	-	1B.1
Hordeum intercedens	vernal barley	None	None	-	3.2
Dichondra occidentalis	western dichondra	None	None	-	4.2

Legend:
CDFG=California Department of Fish and Game
CNPS List= California Native Plant Society
C=Candidate
E=Endangered
T=Threatened
WL=Watchlist
FP=Fully Protected
SSC=Species of Special Concern
CNPS 1B= Rare or Endangered In California and Elsewhere
CNPS 2=Plants rare, threatened, endangered in California, more common elsewhere
CNPS 3= Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported
CNPS 4=Plants of limited distribution
New Threat Code extensions and their meanings:
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

Allen's Pentachaeta: Allen's Pentachaeta (*Pentachaeta aurea* ssp. *allenii*) is a CNPS 1B.1 (Rare or Endangered in California and Elsewhere; Seriously endangered in California) plant. This plant is found in grassy areas below 500 meters in southern South Coast to Peninsular Ranges (Orange Co.). Blooming period is March–May. Although there is some appropriate habitat present, no Allen's Pentachaeta was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Big-leaved crownbeard: Big-leaved crownbeard (*Verbesina dissita*) is a CNPS 1B.1 perennial shrub or subshrub (Rare or Endangered in California and Elsewhere; Seriously endangered in California). Found near the coastal region of California near shrubby coastal slopes and in coastal sage scrub at an elevation less than 200 meters. Blooming period is between May-August. Although there is appropriate habitat present, no Big-leaved crownbeard was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

California box-thorn: California box-thorn (*Lycium californicum*) is a CNPS 4.2 plant (Plants of Limited Distribution; Fairly endangered in California) species that is found in Coastal bluffs, coastal-sage scrub at an elevation: less than 150 meters. Flowering period is in December and March—August. Although there is appropriate habitat present, no California box-thorn was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Catalina Mariposa-lily: Catalina Mariposa-lily (*Calochortus catalinae*) is a CNPS 4.2 plant (Plants of Limited Distribution; Fairly endangered in California) species. It is found in heavy soil, open grassland or scrub at an elevation less than 700 meters in southern Central Coast, western South Coast, especially Channel Islands. Blooming period is from March–May. Although there is some appropriate habitat present, no Catalina Mariposa-lily was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Cliff malacothrix: Cliff malacothrix (*Malacothrix saxatilis* var. *saxatilis*) is a CNPS 4.2 plant (Plants of Limited Distribution; Fairly endangered in California) species

that is found in Coastal bluffs, on flats or in crevices at an elevation less than 200 meters. Flowering period is between April and August. Although there is some appropriate habitat present, no Cliff malacothrix was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Cliff spurge: Cliff spurge (*Euphorbia misera*) is a CNPS 2B.2 plant (Rare, threatened, or endangered in California; common elsewhere). Cliff Spurge is an unusual shrub or sub-shrub with white flowers that grows on sandy coastal bluffs. Cliff Spurge does not grow as well in inland areas with cold winters and hot summers. Rocky slopes, coastal bluffs in coastal sage scrub; Elevation: less than 500 meters. Flowering Time is between January and August. There is no potential for this plant in the study area due to there being no suitable habitat on site. Thus, it is not expected.

Coulter's saltbush: Coulter's saltbush (*Atriplex coulteri*) is native to California and is a CNPS 1B.2 species (Rare, threatened, or endangered in California and elsewhere; fairly endangered in California). It is found in alkaline or clay soils, open sites, scrub, coastal bluff scrub at an elevation less than 500 meters. Bloom period is between March-October. Although there is appropriate habitat present, no Coulter's saltbush was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Fish's milkwort: Fish's milkwort (*Polygala cornuta* var. *fishiae*) is a CNPS 4.3 plant (Plants of Limited Distribution; Not very threatened in California). It is found in Chaparral, oak woodland, between 90–1270 meters from southern Outer South Coast Ranges, Western Transverse Ranges, San Gabriel Mountains, Peninsular Ranges to northern Baja California. Blooming period is May–August. Although there is appropriate habitat present, no Fish's milkwort was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Intermediate mariposa lily: Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*) is a CNPS 1B.2 species (Rare or Endangered in California and Elsewhere; Fairly endangered in California). It is found in dry, rocky, open slopes, often in chaparral, coastal sage scrub, and grasslands at an elevation less than 680 meters. Blooming period is between June and July. Although there is appropriate habitat present, no Intermediate mariposa lily was located during surveys for the species. ***A circumstance of a negative result is not necessarily***

evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.

Laguna Beach dudleya: Laguna Beach dudleya (*Dudleya stolonifera*) is a CNPS 1B.1 species (threatened in California and elsewhere). Laguna Beach dudleya is endemic to the coastline of Orange County California. Found on north facing cliffs and outcrops and below an elevation of 250 feet. Flowering period is between May and July. There is no potential for this species on the proposed project site as the site is above 250 feet.

Many-stemmed dudleya: Many-stemmed dudleya (*Dudleya multicaulis*) is a CNPS 1B.2 species (Rare or Endangered in California and Elsewhere; Fairly endangered in California). This small, vernal live forever is often found on rocky outcrops and can be found with Coastal Sage Scrub, Chaparral and Needle Grass. Although there is appropriate habitat, no Many-stemmed dudleya were seen during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Nuttall's scrub oak: Nuttall's scrub oak (*Quercus dumosa*) is a CNPS 1B.1 species (Rare or Endangered in California and Elsewhere; Seriously endangered in California). The habitat for Nuttall's scrub oak includes sandy soils near the coast, chaparral, sand-stone and coastal sage scrub. Nuttall's scrub oak occurs below 600 feet elevation. Although there is appropriate habitat present, no Nuttall's scrub oak was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Orcutt's pincushion: Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*) is endemic to California alone and is a CNPS 1B.1 species (Rare or Endangered in California and Elsewhere; Seriously endangered in California). Orcutt's pincushion occurs in coastal dunes, bluffs at an elevation between 0 and 328 feet. Blooming period is from April-July. There is no potential for this plant in the study area due to the site being outside of the elevation range of the plant.

Palmer's grappling hook: Palmer's grappling hook (*Harpagonella palmeri*) is a CNPS 4.2 plant (Plants of Limited Distribution; Fairly endangered in California). Dry, semi-barren sites in chaparral, coastal scrub, grassland at an elevation less than 1000 meters. Flowering Time between March and April. Although there is appropriate habitat present, no Palmer's grappling hook was located during surveys for the species. ***A circumstance of a negative result is not necessarily***

evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.

Paniculate Tarplant: Paniculate Tarplant (*Deinandra paniculata*) is a CNPS 4.2 species (limited distribution, watch list; fairly endangered in California). It is found in grassland, open chaparral and woodland, disturbed areas, often in sandy soils up to 1320 meter elevation from south Central Coast/Outer South Coast Ranges, southern Outer South Coast Ranges, South Coast, Western Transverse Ranges (e Santa Ynez Mtns), Peninsular Ranges to northern Baja California. Although there is appropriate habitat present, no Paniculate tarplant was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Small-flowered morning glory: Small-flowered morning glory (*Convolvulus simulans*) is a CNPS 4.2 species (limited distribution, watch list; fairly endangered in California). Small-flowered morning glory is found occasionally in grassy and rocky places below 1000 feet, in coastal sage scrub, valley grassland. Blooming period is March to May. Although there is appropriate habitat present, no Small-flowered morning glory was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Summer holly: Summer holly (*Comarostaphylis diversifolia* ssp*. diversifolia*) is a CNPS 1B.2 species (Rare, threatened, and endangered in California and elsewhere; fairly threatened in California). Summer holly is shrub found in chaparral habitat at an elevation between 100 to 550 meters. Flowering Time is between May and June. There is no potential for this species in the proposed project area due to there being no suitable habitat on site.

Thread-leaved brodiaea: Thread-leaved brodiaea (*Brodiaea filifolia*) is endemic to California alone, is a federal threatened species, is a California endangered species, and is a CNPS 1B.1 plant (Rare, threatened, or endangered in California and elsewhere; seriously endangered in California). It is found in Valley Grassland, Foothill Woodland, Coastal Sage Scrub, and Freshwater Wetland plant communities in vernal-pools habitat. It is equally likely to occur in wetlands or non- wetlands. Flowering Time is between March and June. Although there is appropriate habitat present, no thread-leaved brodiaea was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely***

unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.

Vernal barley: Vernal barley (*Hordeum intercedens*) is a CNPS 3.2 species (Plants about which more information is needed; fairly endangered in California). It is found in vernal pools, dry, saline streambeds, and alkaline flats at an elevation below 500 meters in the San Joaquin Valley, Outer South Coast Ranges, South Coast, Channel Islands, Peninsular Ranges to northwestern Baja California. Blooming period between March–June. There is no potential for this species in the proposed project area due to there being no suitable habitat on site.

Western dichondra: Western dichondra (*Dichondra occidentalis*) is a CNPS 4.2 species (limited distribution, watch list; fairly endangered in California). Found among rocks, shrubs, in coastal scrub, chaparral, and oak woodland at an elevation less than 520 meters. Blooming period is March-June. Although there is appropriate habitat present, no western dichondra was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

White rabbit-tobacco: White rabbit-tobacco (*Pseudognaphalium leucocephalum*) is a perennial herb native to California and a CNPS 2B.2 species (Rare, threatened, or endangered in California, but common elsewhere; fairly threatened in California). It can be found in Chaparral, Cismontane woodland, Coastal scrub, and Riparian woodland plant communities (CNPS 2019).Although there is appropriate habitat present, no White rabbit-tobacco was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the plant has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Wildlife

Wildlife typical of *Baccharis pilularis* Alliance, *Baccharis salicifolia*, *Isocoma menziesii* Alliance, *Nicotiana glauca*, *Quercus agrifolia* Alliance, Non-native *Cynara cardunculus* Alliance, Non-native grassland, disturbed habitat, and developed/landscape habitat within the project site include San Diego alligator lizard, western fence lizard, western side-blotched lizard, gopher snake, California kingsnake and western rattlesnake, red-tailed hawk, American kestrel, mourning dove, greater roadrunner, common raven, acorn woodpecker, bushtit, house finch, northern mockingbird, wrentit, European starling, California towhee, song sparrow, desert cottontail, California ground squirrel, coyote and mule deer. The occurrence of mature oak trees greatly influences the presence of many of the bird species (e.g. acorn woodpecker). However, most of these wildlife species are commonly found in the urban interface.

Reptiles

No special-status reptile species has been documented in the one mile vicinity of the project site (Rarefind 5 -2019). During the site assessment the occurrence of no special-status reptile species was observed on the site and we determined that it has medium potential to occur on the project site. In the subsection below, we discuss the reptile species that have been documented in the vicinity of the site.

TABLE 11

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS REPTILE SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Arizona elegans occidentalis	California glossy snake	None	None	SSC
Phrynosoma blainvillii	coast horned lizard	None	None	SSC
Aspidoscelis tigris stejnegeri	coastal whiptail	None	None	SSC
Aspidoscelis hyperythra	orange-throated whiptail	None	None	WL
Crotalus ruber	red-diamond rattlesnake	None	None	SSC
Diadophis punctatus modestus	San Bernardino ringneck snake	None	None	-
Diadophis punctatus similis	San Diego ringneck snake	None	None	-
Anniella stebbinsi	southern California legless lizard	None	None	SSC
Thamnophis hammondii	two-striped gartersnake	None	None	SSC
Emys marmorata	western pond turtle	None	None	SSC

Legend:
WL=Watchlist
SSC=Species of Special Concern

California glossy snake: California glossy snake (*Arizona elegans occidentalis*) is a state species of special concern. This snake inhabits arid scrub, rocky washes, grasslands and chaparral. California glossy snake appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing. Although there is appropriate habitat present, no California glossy snake was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the snake has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Coast horned lizard: Coast horned lizard (*Phrynosoma blainvillei*) is a state species of special concern. Typically occurring in grassland and scrub habitats with suitable basking sites and ample numbers of ant prey, this lizard usually occupies habitats that have open basking areas and loose soil for burrowing. The coast horned lizard is considered at-risk due to conversion of natural areas to agriculture and development, and the spread of non-native Argentine ants into Southern California (Stebbins 2003). Although there is appropriate habitat present, no coast horned lizard was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the lizard has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Coastal Whiptail: The coastal whiptail (*Aspidoscelis tigris stejnegeri*) is a state species of concern. It occurs in relatively undisturbed open scrub habitats

throughout the region. It is a relatively common lizard species in the region. Although there is appropriate habitat present and there are disturbed areas there is a low potential for this species to be on the project site. Although there is appropriate habitat present, no coastal whiptail was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the lizard has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Orange-throated whiptail: Orange-throated whiptail (*Aspidoscelis hyperythra*) is a state species of special concern. The orangethroat whiptail has similar habitat requirements as the coastal whiptail, occurring in open scrub and woodlands with an ample invertebrate prey base. Although there is appropriate habitat present, no orange-throated whiptail was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the lizard has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Red-Diamond Rattlesnake: Red-diamond rattlesnake (*Crotalus ruber*) is a state listed species of special concern. This rattlesnake inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland and cultivated areas. On the desert slopes of the mountains, it ranges into rocky desert flats. Although there is appropriate habitat present, no red-diamond rattlesnake was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the snake has a low possibility of occurring on the project site due to the presence of suitable habitat.***

San Bernardino ringneck snake: San Bernardino ringneck snake (*Diadophis punctatus modestus*) is a rare species. This small snake inhabits mesic microhabitats in sage scrub, riparian corridors, oak woodlands, canyons and grasslands. Although there is appropriate habitat present, no San Bernardino ringneck snake was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the snake has a low possibility of occurring on the project site due to the presence of suitable habitat.***

San Diego ringneck snake: San Diego ringneck snake (*Diadophis punctatus similis*) is a small, thin snake with gray, blue-gray, blackish or dark olive dorsal coloring. The San Diego ringneck snake can be found in San Diego County along the coast and into the Peninsular range, and southwestern San Bernardino County. The habitat for this species includes wet meadows, rocky hillsides,

gardens, farmland, grassland, chaparral, mixed coniferous forests and woodlands (CaliforniaHerps, 2019). Although there is appropriate habitat present, no San Diego ringneck snake was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the snake has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Southern California legless lizard: Southern California legless lizard (*Anniella stebbinsi*) is a California species of special concern. Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans (Stebbins and McGinnis, 2012). Occurs in moist warm loose soil with plant cover. Moisture is essential. Southern California legless lizard occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas and dunes stabilized with bush lupine and mock heather often indicate suitable habitat. They can be found under surface objects such as rocks, boards, driftwood, and logs. Although there is appropriate habitat present, no southern California legless lizard was located during surveys for the species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the lizard has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Two-striped garter snake: Two-striped garter snake (*Thamnophis hammondi*) is a state species of special concern. It occurs primarily along permanent streams, although it also may occur in association with vernal pools or intermittent creeks. It has been found considerable distances from water sources in chaparral or other habitat types. The species occurred in the Santa Ana River basin in the past; however, no post-80's records are known in the area (Jennings 2004). It has very likely been extirpated due to human disturbance, pollution, and the introduction of predatory non-native fish and the voracious bullfrog. Although potential habitat for this species is present (sage scrub), it was not located during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, the snake has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Western pond turtle: Western pond turtle (*Actinemys marmorata*) is a California species of special concern. It inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons. Logs, rocks, submerged vegetation; mud, undercut banks, and ledges are necessary habitat components for cover as well as a water depth greater than 2

meters. Sunning sites, emergent vegetation, and suitable terrestrial shelter characterize optimal habitat (RTIP 2003). Habitat for the western pond turtle is not present on the site, and this species has no potential to occur on the project site.

Amphibians

No special-status amphibian species has been documented in the one mile vicinity of the project site (Rarefind 5 -2019). During the site assessment the occurrence of no special-status, amphibian species was observed on the site and we determined that it has no potential to occur on the project site. In the subsection below, we discuss the amphibian species that have been documented in the vicinity of the site.

TABLE 12

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS AMPHIBIAN SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Anaxyrus californicus	arroyo toad	Endangered	None	SSC
Rana draytonii	California red-legged frog	Threatened	None	SSC
Spea hammondii	western spadefoot	None	None	SSC

Legend:
E=Endangered
SSC=Species of Special Concern

Arroyo toad: Arroyo toad (*Anaxyrus californicus*) is a federal endangered species and a state species of special concern. The arroyo toad is a relatively small (2-3 inches snout-vent length) toad. Its coloration ranges from olive green or gray to light brown. This toad prefers riparian habitats with sandy streambeds that have cottonwood, sycamore, and willow trees. Some populations occur in streams within coniferous forests. The stream setting usually has adjacent shallow pools where the toad may sit in the water while partially exposed above (USFWS 2005). The project site is located outside critical habitat and the known locations of arroyo toad. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

California Red-Legged Frog: California red-legged frog *(Rana draytonii*) is a federal threatened species and a state species of special concern. It occurs in streams with slow-moving water and deep pools with dense shrubby riparian vegetation at the pool edges. There is no potential for this species on the proposed project site, as there is no suitable habitat.

Western spadefoot: Western spadefoot (*Spea hammondi*) is a state species of special concern. It occurs in coastal sage scrub, chaparral and grassland habitats. It is typically found along sandy washes, on floodplains and in low hills. Temporary breeding pools are a crucial requirement for its continued occupation of an area. The project site is located within suitable habitat for western spadefoot, although the species was not found during surveys***. A***

circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.

Avian

Two avian species have been documented within the one mile vicinity of the project site (Rarefind 5 -2019). In the subsection below, we discuss the special-status avian species that have been documented in the vicinity of the site.

TABLE 13

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS AVIAN SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP
Cypseloides niger	black swift	None	None	SSC
Nycticorax nycticorax	black-crowned night heron	None	None	-
Eremophila alpestris actia	California horned lark	None	None	WL
Hydroprogne caspia	Caspian tern	None	None	-
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	None	None	SSC
Polioptila californica californica	coastal California gnatcatcher	Threatened	None	SSC
Accipiter cooperii	Cooper's hawk	None	None	WL
Calypte costae	Costa's hummingbird	None	None	-
Phalacrocorax auritus	double-crested cormorant	None	None	WL
Aquila chrysaetos	golden eagle	None	None	FP ; WL
Ammodramus savannarum	grasshopper sparrow	None	None	SSC
Ardea herodias	great blue heron	None	None	-
Ardea alba	great egret	None	None	-
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered	-
Lanius ludovicianus	loggerhead shrike	None	None	SSC
Charadrius montanus	mountain plover	None	None	SSC
Circus hudsonius	northern harrier	None	None	SSC
Baeolophus inornatus	oak titmouse	None	None	-
Pandion haliaetus	osprey	None	None	WL
Progne subis	purple martin	None	None	SSC
Selasphorus rufus	rufous hummingbird	None	None	-
Accipiter striatus	sharp-shinned hawk	None	None	WL
Egretta thula	snowy egret	None	None	-
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	None	None	WL
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	Endangered	-
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC
Elanus leucurus	white-tailed kite	None	None	FP
Setophaga petechia	yellow warbler	None	None	SSC
Icteria virens	yellow-breasted chat	None	None	SSC

Legend:
FP=Fully Protected
SSC=Species of Special Concern
WL=Watchlist

American Peregrine Falcon: The Peregrine Falcon (*Falco peregrinus anatum*) is a state fully protected species, which was delisted from endangered both federally and by the state. Habitat is mostly riparian areas and coastal and inland wetlands. American Peregrine falcon feeds by swooping from flight onto prey, chases in flight and rarely hunts from a perch. American Peregrine falcon requires protected cliffs and ledges for cover. It breeds and feeds near water

from May to August. These birds forage over extensive areas and can be expected to occur almost anywhere in California during the winter. Due to its rarity and transient presence in the area, this species would be negligibly affected by the project.

Black swift: Black swift (*Cypseloides niger*) is a state species of special concern. The Black Swift breeds very locally in four regions of California: the central and southern Sierra; the coastal cliffs and mountains of San Mateo, Santa Cruz, and Monterey counties; the San Gabriel, San Bernardino, and San Jacinto mountains of southern California; and a limited area in the Cascade Range (Grinnell and Miller 1944; Small 1974). Their breeding habitat is frequently associated with water. The birds most often nest on high cliff faces, either above the ocean surf or behind or next to waterfalls. There is no potential for the species to occur on site, as there is no suitable habitat present.

Black crowned night heron: Black crowned night heron (*Nycticorax nycticorax*) is a state species of special concern. Most colonies of black-crowned night herons are associated with large wetlands. They inhabit a variety of wetland habitats such as swamps, streams, rivers, marshes, mud flats and the edges of lakes that have become overgrown with rushes and cattails. There is no potential for the species to occur on site, as there is no suitable habitat present.

California Horned lark: California Horned lark (*Eremophila alpestris actia*) is a California watch list species. The horned lark is a common to abundant resident in a variety of open habitats, usually where trees and large shrubs are absent. In the Midwest, the species has been characterized as the most abundant species in row-crop fields. Range-wide, California horned larks breed in level or gently sloping short grass prairie, montane meadows, "bald" hills, opens coastal plains, fallow grain fields, and alkali flats. Within southern California, California horned larks breed primarily in open fields, (short) grasslands, and rangelands. Grasses, shrubs, forbs, rocks, litter, clods of soil, and other surface irregularities provide cover. The site does provide marginally suitable habitat for this species (there is no short grasslands present), and the species was not observed during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Caspian Tern: Caspian tern (*Hydroprogne caspia*) is a sensitive species. Breeds in wide variety of habitats along water, such as salt marshes, barrier islands, dredge spoil islands, freshwater lake islands, and river islands. During migration and winter found along coastlines, large rivers and lakes. Caspian tern roosts on islands and isolated spits. There is no potential for the species to occur on site, as there is no suitable habitat present.

Coastal Cactus Wren: Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) is a state species of special concern. It is common resident of cactus patches in sage scrub stands in the region of the project. A small area of

cactus habitat for this species is present within the study area. The site does provide suitable habitat for this species, although the species was not observed during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Coastal California gnatcatcher: Coastal California gnatcatcher (*Polioptila californica californica*) subspecies is listed as Threatened under the Federal Endangered Species Act and state species of special concern. This small, insectivorous songbird occurs almost exclusively in several distinctive subassociations of the coastal sage scrub plant community (USFWS 1993). **Three coastal California gnatcatchers were observed on one field visit utilizing the site for foraging.**

Cooper's hawk: Cooper's hawk (*Accipiter cooperii*) is on Audubon Watchlist. It is a bird of woodland areas, especially dense stands of live oak and riparian vegetation. It typically nests in second-growth conifers or in deciduous riparian stands. Snags in edge areas and patchy woodlands are favorite perches. These accipiters are hunters of small birds, small mammals, reptiles, and amphibians. Males defend an area with a radius of about 100 m around potential nest sites prior to nesting. Distance between nests ranges from 1.6-4.2 km. Home range estimates vary from 18-531 ha. Cooper's hawks breed from March through August, and generally produce a single brood of 4-5 eggs, with typical fledgling success of 2 young per pair annually (Zeiner et al. 1990). Cooper's hawk was not seen on the site and was not observed during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Costa's hummingbird: Costa's hummingbird (*Calypte costae*) is a locally rare species. It is found in desert and semi-desert, arid brushy foothills and chaparral habitats. In migration and winter also found in adjacent mountains and in open meadows and gardens. Although potential habitat for this species is present (sage scrub), it was not located during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Double-creasted cormorant: Double-creasted cormorant (*Phalacrocorax auratus*) is on State of California Watchlist species. Double-crested Cormorants are colonial waterbirds that seek aquatic bodies big enough to support their mostly fish diet. However, they may roost and form breeding colonies on smaller lagoons or ponds, and then fly up to 40 miles to a feeding area. In addition to fishing waters, cormorants need perching areas for the considerable amount of time they spend resting each day. After fishing, cormorants retire to

high, airy perches to dry off and digest their meals—rocks, wires, tops of dead trees, ship masts. They tend to form breeding colonies in clusters of trees in or near water. After a while, masses of cormorant guano may kill these trees and the trees may topple, at which point the cormorants may switch to nesting on the ground. There is no potential for the species to occur on site, as there is no suitable habitat present.

Golden eagle: Golden eagle (*Aquila chrysaetos*) is a California Department of Fish and Wildlife fully protected species, a watch list species and a U.S. Fish and Wildlife Service Bird of Conservation Concern. These agencies are concerned with the year-long (i.e., breeding and wintering) conservation of the species. Typical habitat of the golden eagles includes rolling foothills, mountain areas, sage-juniper flats, and deserts. Golden eagles nest on cliffs and in large trees in open areas (Zeiner et al. 1990). The site does provide suitable foraging habitat for the species, although none were observed during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Grasshopper sparrow: Grasshopper sparrow (*Ammodramus savannarum*) is a state species of special concern. This species is a small sparrow found in grasslands, prairies, hayfields, and open pastures with little to no scrub cover and often with some bare ground. Birds in the western part of the range can tolerate some brushy habitat but avoid areas that are too overgrown. Grasshopper sparrow's winter primarily in grass-dominated fields. California has both local breeding populations and migrating winter populations (Cornell Lab of Ornithology, 2019). The species was not observed during surveys, thus not expected at the project site due to the abundance of cover. The Grasshopper sparrow has no potential to occur on the site.

Great blue heron: Great blue heron (*Ardea herodias*) is a sensitive species. Great blue herons always live near sources of water, including rivers, lake edges, marshes, saltwater seacoasts, and swamps. They usually nest in trees or bushes that stand near water, breeding at elevations of up to 1,500 meters. Great blue heron was not observed during field surveys, nor does it nest in the project area. Great blue heron has no potential to occur on the site.

Great egret: Great egret (*Ardea alba*) is a sensitive species. The ideal location for great egrets is near any form of water. Streams, lakes, ponds, mud flats, saltwater and freshwater marshes are inhabited by this beautiful bird. Wooded swamps and wetlands are the preferred location for great egrets and other heron species. The great egret was not observed during field surveys, nor does it nest in the project area. Great egret has no potential to occur on the site.

Least Bell's vireo: Least Bell's vireo (*Vireo bellii pusillus*) (LBV) is a federal and state endangered species. Preferred habitat conditions for this species include a dense undergrowth of young willows or mulefat, typically combined with an

overstory of taller willows and associated with flowing water. Wider woodlands are more likely to harbor LBV than narrower ones (RCIP 2003). There is marginal suitable foraging habitat on the project site. Surveys were conducted outside of the breeding season, and LBV are known to nest in the adjacent Creek. Therefore, it is assumed that LBV may forage on the project site. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Loggerhead shrike: Loggerhead shrike (*Lanius ludovicianus*) is a state listed species of special concern. The species frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover. Except when nesting, both sexes of the species will prefer to spend most of their time in open places hiding in order to search for prey and surprise it. Thus, the Loggerhead will prefer a country field bordered with trees or replete with brush / thickets to almost any other. The site provides suitable habitat for this species however the species was not observed during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Mountain Plover: Mountain plover (*Charadrius montanus*) is a state species of special concern. At all seasons, Mountain Plovers are strongly associated with short-grass prairie habitats, or their equivalents, that are flat and nearly devoid of vegetation (Graul and Webster 1976, Knopf 1996). They appear to respond primarily to physical characteristics of vegetation (e.g., cover, structure) rather than species composition, as is true of most grassland-associated birds typically inhabiting open (often agricultural) fields in the region. The site does not provide suitable habitat for this species as there is no short-grass prairie present on the project site. Mountain plover has no potential to occur on the site.

Northern harrier: Northern harrier (*Circus cyaneus*) is a state species of special concern. Northern harriers prefer open habitat types and are seldom found in wooded areas. The species frequently nests in emergent wetlands or along rivers or lakes, but may also nest in grasslands, grain fields, or on sagebrush flats several miles from water (Zeiner et al. 1990). Northern harrier nest sites are typically located in large patches of habitat that are free from disturbance. The site does not providing suitable nesting habitat for the northern harrier; however, the species may use the site for foraging. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Oak Titmouse: Oak Titmouse (*Baeolophus inornatus*) is a rare species. Oak Titmice live mostly in warm, open, dry oak or oak-pine woodlands. Many will use scrub oaks or other brush as long as woodlands are nearby. They live in a

restricted range, from southwest Oregon to northwest Baja California, with another population in the Cape District of south Baja California. In a few areas they use habitats without oaks. In extreme northern California, Oak Titmice live in western juniper woodlands (the only part of their range where they overlap with the Juniper Titmouse). On San Benito Mountain in central California they live in open pine forests. In the mountains of northwest Baja, they live in pinyon pine woodland. At the eastern edge of their range, they live in pinyon or California juniper mixed with Joshua trees. The site does not provide suitable habitat for this species. Oak titmouse has no potential to occur on the site.

Osprey: Osprey (*Pandion haliaetus*) is a California Watchlist species. Ospreys are found around nearly any body of water: saltmarshes, rivers, ponds, reservoirs, estuaries, and even coral reefs. Their conspicuous stick nests are placed in the open on poles, channel markers, and dead trees, often over water. The site does not provide suitable habitat for this species. Osprey has no potential to occur on the site.

Purple martin: The purple martin (*Progne subis*) is a California species of special concern. It is the largest of the swallows, nests in natural holes, crevices, and cliffs and also in bird houses. It is commonly found in saguaro cactus and western montane forests (Cornell Lab of Ornithology 2019). There is a no potential for the species to occur on site, as there is no suitable habitat present.

Rufous Hummingbird: Rufous hummingbird (*Selasphorus rufus*) is a locally rare species. Rufous Hummingbirds breed in Rufous Hummingbirds typically breed in open or shrubby areas, forest openings, yards, and parks, and sometimes in forests, thickets, swamps, and meadows from sea level to about 6,000 feet. During their migration, look for Rufous Hummingbirds in mountain meadows up to 12,600 feet elevation. In Mexico, wintering Rufous Hummingbirds live in oak, pine, and juniper woods at 7,500 to 10,000 feet elevation, shrubby areas, and thorn forests (Cornell Lab of Ornithology 2019). The site does not provide suitable habitat for this species. Rufous hummingbird has no potential to occur on the site.

Sharp-shinned Hawk: Sharp-shinned hawk (*Accipiter striatus*) is a California Watchlist species. Sharp-shinned hawks are small accipiter's that utilize a variety of habitats, from Jeffrey pine forest, to mixed conifer, black oak, and riparian woodlands. They generally nest in dense stands of small conifers, near water. A key habitat element is the presence of north-facing slopes, with perches for plucking prey. Sharp-shinned hawks frequently hunt from woodland edges and brushy pastures. They prey mainly on small birds, but may take small mammals, reptiles, and amphibians. Home range and territory size estimates for this species range from 67-2750 ha. The average distance between nests has been measured at 4.1 km. Sharp-shinned hawks breed from April to August, and usually produce a clutch of 4-5 eggs (Zeiner et al. 1990a). Suitable nesting and roosting habitat is not present. Sharp-shinned hawk has no potential to occur on the site.

Snowy Egret: Snowy egret (*Egretta thula*) is a sensitive species. They are most common along the coast, though they do breed patchily in inland wetlands. Snowy Egrets nest colonially, usually on protected islands, and often with other small herons. They concentrate on mudflats, beaches, and wetlands, but also forage in wet agricultural fields and along the edges of rivers and lakes. The snowy egret was not observed during field surveys, nor does it nest in the project area. Snowy egret has no potential to occur on the site.

Southern California rufous-crowned sparrow: Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) is an Audubon watch-list species. Rufous-crowned sparrows breed and feed on steep, dry, herbage-covered hillsides with scattered shrubs and rock outcrops (Zeiner et al. 1990). There is no potential for this species on the proposed project site, as there is no suitable habitat and the project site. Southern California rufous-crowned sparrow has no potential to occur on the site.

Southwestern willow flycatcher: Southwestern Willow Flycatcher (*Empidonax trailii extimus*) is a federal and state endangered species. This small flycatcher occurs throughout coastal southern California as an uncommon spring migrant and fairly common fall migrant, generally in riparian areas. Nesting is rare and very local in the region, and extensive willow-riparian woodlands are required. Found in wet meadows and montane riparian habitats from 610-2,500 meters (2,000-8,000 feet.) Willow flycatchers prefer dense willow thickets. They nest from May through June. Formerly, the species bred extensively throughout the region. Major declines in its preferred breeding habitat and brood parasitism by Brown-headed cowbird are believed to have precipitated its rapid decline this century. There is no potential for southwestern willow flycatcher on the project site, as there is no suitable habitat.

Tri-colored blackbird: Tri-colored blackbird (*Agelaius tricolor*) is a federal threatened and state species of special concern. It is an uncommon to locally common species known from the area of the study area. The species typically requires freshwater marshes and ponds for nesting and adjacent or nearby fields for foraging. Where found, it can occur in colonies of several to many thousands of birds. There is no potential for this species on the project site, as there is no suitable habitat.

White-tailed kite: White-tailed kite (*Elanus leucurus*) is a U.S. Fish and Wildlife Service Migratory Non-game Bird of Management Concern and California fully protected species. The white-tailed kite is a year-long resident in coastal and valley lowlands, and is rarely found away from agricultural areas. The species inhabits herbaceous and open stage habitat types, mostly in cismontane California. The white-tailed kite typically nests atop a dense tree located near open foraging areas (Zeiner et al. 1990). There is no potential for this species on the proposed project site, as there is no area of suitable foraging habitat.

Yellow warbler: Yellow warbler (*Setophaga petechia*) is a state species of special concern. It is found in moist thickets, especially along streams and in swampy areas and gardens. The yellow warbler prefers wetlands and mature

riparian woodlands dominated by cottonwoods, alders, and willows. It also uses well watered, second growth woodlands and gardens. There is no potential for this species on the proposed project site, as there is no suitable habitat.

Yellow-breasted chat: The yellow-breasted chat (*Icteria virens*) is a California species of special concern. It is an uncommon local summer resident of well-developed riparian thickets in the region of the project. There is no potential for yellow-breasted chat being present on the project site, as there are no riparian thickets on the project site.

Fish

One fish species have been documented within the one mile vicinity of the project site (Rarefind 5 -2019). In the subsection below, we discuss the special-status fish species that have been documented in the vicinity of the site.

TABLE 14

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS FISH SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Gila orcuttii	arroyo chub	None	None	SSC
Gasterosteus aculeatus microcephalus	resident threespine stickleback	None	None	-
Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	Endangered	None	-
Eucyclogobius newberryi	tidewater goby	Endangered	None	SSC

Legend:
SSC=Species of Special Concern

Arroyo chub: Arroyo chub (*Gila orcutti*) is a state species of special concern. The arroyo chub is adapted to surviving in the warm fluctuating streams of the Los Angeles Plain. They prefer slow moving or backwater sections of warm to cool streams with substrates of sand or mud (RCIP-2003). Arroyo chub does not occur on the site, as there are only intermittent drainages present. There is no potential for this species on the proposed project site, as there is no appropriate habitat.

Resident threespine stickleback: Resident threespine stickleback (*Gasterosteus aculeatus microcephalus*) is a rare species. This fish may exist within a single stream or drainage. Typically the amount of armor is representative of the predatory threat, and Stickleback bodies vary from fully plated to unarmored. The Stickleback may have a resident freshwater or anadromous life history, though this fish is capable of completing its entire life cycle in fresh or saltwater. Within a stream the Threespine Stickleback prefers shallow slow water along the edge with varying substrates. They prefer areas with adequate cover in the form of aquatic plants or overhanging brush to protect them from predators like birds and piscivorous fish. In addition Sticklebacks need clear water for nest building and food foraging. These fish require cool water for long term survival, in the range of 23-24°C. Good salinity tolerance has allowed them to inhabit estuaries or saltwater environments, sometimes living as far as 800 km offshore. Sticklebacks usually form loose schools or shoals, and individuals as well as

groups form specific feeding habits. There is no potential for this species on the proposed project site, as there is no appropriate habitat.

Steelhead - southern California DPS: Steelhead - southern California DPS (*Oncorhynchus mykiss irideus pop. 10*) are winter-run steelhead that persists in streams that have warm, dry lower reaches on the coastal plain. They are federally endangered. There is no potential for this species on the proposed project site, as there is no habitat.

Tidewater goby: Tidewater goby (*Eucyclogobius newberryi*) is endemic to California, a Federal endangered species and a State species of special concern. Tidewater goby is a small, elongate, grey-brown fish rarely exceeding 50 millimeters (2 inches) standard length. It is characterized by large pectoral fins. Tidewater goby is found primarily in waters of coastal lagoons, estuaries, and marshes. Its habitat is characterized by brackish (somewhat salty) water in shallow lagoons and in lower stream reaches where the water is fairly still but not stagnant. Tidewater goby is the only species in the genus *Eucyclogobius* and is almost unique among fishes along the Pacific coast of the United States in its restriction to waters with low salinities in California's coastal wetland habitats (USFWS, 2008). There is no potential for this species on the proposed project site, as there is no habitat.

Mammals

No special-status mammal species have been documented within the one mile vicinity of the project site (Rarefind 5 -2019). In the subsection below, we discuss the special-status mammal species that have been documented in the vicinity of the site.

TABLE 15

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS MAMMAL SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Chaetodipus californicus femoralis	Dulzura pocket mouse	None	None	SSC
Aspidoscelis hyperythra	orange-throated whiptail	None	None	WL
Antrozous pallidus	pallid bat	None	None	SSC
Nyctinomops femorosaccus	pocketed free-tailed bat	None	None	SSC
Crotalus ruber	red-diamond rattlesnake	None	None	SSC
Diadophis punctatus modestus	San Bernardino ringneck snake	None	None	-
Diadophis punctatus similis	San Diego ringneck snake	None	None	-
Anniella stebbinsi	southern California legless lizard	None	None	SSC
Thamnophis hammondii	two-striped gartersnake	None	None	SSC
Eumops perotis californicus	western mastiff bat	None	None	SSC
Emys marmorata	western pond turtle	None	None	SSC
Myotis yumanensis	Yuma myotis	None	None	-

Legend:
WL=Watchlist
SSC=Species of Special Concern

Dulzura pocket mouse: Dulzura pocket mouse (*Chaetodipus californicus femoralis*) is a California species of special concern. The Dulzura pocket mouse habitat includes coastal sage scrub, chamise, redshank and montane chaparral, sagebrush, annual grassland, valley foothill hardwood, valley foothill hardwood-

conifer, and montane hardwood habitats (Zeiner et al. 1990). There is suitable habitat for this species however none were found during surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a high possibility of occurring on the project site due to the presence of suitable habitat.***

Pallid Bat: Pallid bat (*Antrozous pallidus*) is a state species of special concern. It roosts in crevices in rocks, buildings and occasionally trees, and forages over a variety of habitat types. It is known to occur in the project study area, but was not detected during field surveys. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a high possibility of occurring on the project site due to the presence of suitable habitat.***

Pocketed Free-tail Bat: Pocketed free-tail bat (*Nyctinomops femorosaccus*) is a state species of special concern. It ranges from southern California to Baja California and through southwestern Arizona into central Mexico. They are typically found in rocky, desert areas with relatively high cliffs. There is no potential for this species on the proposed project site.

Western mastiff bat: Western mastiff bat (*Eumops perotis californicus*) is a state species of special concern. Western mastiff bat is found in desert scrub, chaparral, mixed conifer forest, giant sequoia forests, and montane meadows. Because of its large wingspan, the western mastiff bat requires roosts that have at least 6.5 feet (2 meters) of free space to drop from to initiate flight. This species was not detected during field surveys of the project study area. However, it is likely to forage over open habitats in the project area at some time. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. Although extremely unlikely, this species has a low possibility of occurring on the project site due to the presence of suitable habitat.***

Yuma Myotis: Yuma myotis (*Myotis yumanensis*) is a rare mammal. Its range extends throughout the western United States into Mexico. They are typically found in caves, tunnels, and buildings, in arid areas. There is no potential for this species on the proposed project site, as there is no appropriate habitat.

Crustaceans

Two special-status crustaceans have been documented in the vicinity of the project site (none within one mile of the project) (Rarefind 5 2019). In the subsection below, we discuss the crustacean species that has been documented in the vicinity of the site.

TABLE 16

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS CRUSTACEAN SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Streptocephalus woottoni	Riverside fairy shrimp	Endangered	None	
Branchinecta sandiegonensis	San Diego fairy shrimp	Endangered	None	

Riverside fairy shrimp: Riverside fairy shrimp (*Streptocephalus woottoni*) is a federal endangered species. It is typically found in pools, ponds, and depressions that are deeper and cooler than the basins that support the related species, the endangered San Diego fairy shrimp (*Streptocephalus sandiegonensis.* The critical habitat includes Riverside fairy shrimp habitat throughout the species' range in the United States (*i.e.*, Los Angeles, Orange, Riverside, San Diego, and Ventura counties, California); and is generally based on the geographic location of vernal pools, soil types, and local variation of topographic position (*i.e.*, coastal mesas or inland valleys). There is no Riverside fairy shrimp on the project site due to the absence of suitable habitat.

San Diego fairy shrimp: San Diego fairy shrimp (*Streptocephalus sandiegonensis*) is a federal endangered species. It is typically found in pools, ponds, and depressions that are shallower and warmer than the basins that support the related species, the endangered Riverside fairy shrimp (*Streptocephalus woottoni*). The critical habitat includes Riverside fairy shrimp habitat throughout the species' range in the United States (*i.e.*, Los Angeles, Orange, Riverside, San Diego, and Ventura counties, California); and is generally based on the geographic location of vernal pools, soil types, and local variation of topographic position (*i.e.*, coastal mesas or inland valleys). The San Diego fairy shrimp does not occur on the project site due to the absence of suitable habitat.

Insects

No special-status insects have been documented within the one mile vicinity of the project site (Rarefind 5 -2019). In the subsection below, we discuss the insect species that has been documented in the vicinity of the site.

TABLE 17

SAN JUAN CAPISTRANO QUADRANGLE SENSITIVE STATUS INSECT SPECIES

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	CALIF STATUS	CDFW
Danaus plexippus pop. 1	monarch - California overwintering population	None	None	-

Monarch butterfly: The monarch butterfly (*Danaus plexippus*) is bright orange with black borders and black veins. The habitat for the monarch butterfly is a predominantly open country, frost intolerant species whose range of breeding habitats is greatly dependent upon the presence of asclepiad flora (milkweeds). The monarch requires dense tree cover for overwintering, and the majority of

the present sites in California are associated with Eucalyptus trees, specifically the blue gum, *Eucalyptus globulus* (Brower, UMMOZ). There is no suitable habitat on the project site for overwintering Monarch butterfly. There is no potential for the monarch butterfly to be overwintering on the project site.

Other Sensitive Biological Resources

City of Mission Viejo has ordinances regarding tree protection and CSS habitat loss (CHAPTER 9.27. - LANDSCAPING STANDARDS -Removal or destruction of trees. Removal of healthy, shade providing, aesthetically valuable trees shall be discouraged (Ord. No. 98-193, §§ 1—4, 10-19-98) and CHAPTER 9.98. - CSS HABITAT LOSS PERMITS (Ord. No. 98-193, §§ 1—4, 10-19-98). These ordinances may or may not apply to this project. Additional goals are included in the City of Mission Viejo Conservation/Open Space Element.

Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for dispersal or migration of animals, as well as dispersal of plants (e.g., via wildlife vectors). Wildlife corridors contribute to population viability in several ways: (1) they assure continual exchange of genes between populations which helps maintain genetic diversity; (2) they provide access to adjacent habitat areas representing additional territory for foraging and mating; (3) they allow for a greater carrying capacity; and (4) they provide routes for colonization of habitat lands following local population extinctions or habitat recovery from ecological catastrophes. Habitat linkages are patches of native habitat that function to join two larger patches of habitat. They serve as connections between habitat patches and help reduce the adverse effects of habitat fragmentation. Although individual animals may not move through a habitat linkage, the linkage is a potential route for gene flow and long-term dispersal. Habitat linkages may serve both as habitat and avenues of gene flow for small animals such as reptiles, amphibians, and rodents. Habitat linkages may be represented by continuous patches of habitat or by nearby habitat "islands" that function as stepping stones for dispersal and movement (especially for birds and flying insects).

Arroyo Trabuco Creek is identified in the Orange County Southern Subregion Habitat Conservation Plan (HCP) as part of a linkage system from Casper's Regional Park to O'Neill Regional Park. Riparian corridors are typically used by wildlife as movement corridors and this drainage links inland areas of Orange County with the Pacific Ocean. The project site connects hydrologically to Arroyo Trabuco Creek. Mule deer and coyote prints were observed on the project site during surveys, indicating that the project site is functioning as a wildlife use and movement area.

O'Neill Ranch Habitat Reserve

The project site is not part of the O'Neill Ranch Habitat Reserve, however it is immediately adjacent to Arroyo Trabuco Creek and connects hydrologically to Arroyo Trabuco Creek.

Orange County Southern Subregion Habitat Conservation Plan

The site is within Subarea 4 of the Orange County Southern Subregion Habitat Conservation Plan (HCP). The City of Mission Viejo is not a participating landowner to the HCP. However, non-participating landowners have the option of addressing unavoidable impacts/take within reserves by either providing acceptable mitigation through separate permits or authorizations under FESA/CESA.

Habitat linkages and wildlife corridors facilitate the dispersal by smaller, less mobile species and frequent movement (e.g., daily, weekly, etc.) by large mammal species such as mountain lion, mule deer, coyote and bobcat. The species identified below only highlight a much broader suite of species served by the habitat linkages and corridors. Accordingly, the species identified should not be interpreted as the only species that benefit from the linkages and corridors. It can be reasonably assumed that habitat linkages and corridors that function for large mammals (except coyote) also function for many other species.

The following identifies portions of the project site:

*The area north of Oso Reservoir, including O'Neill Regional Park and the nursery provides a lower elevation "stepping stone" habitat linkage between the Southern Subregion planning area and the Central Subarea component of the Central and Coastal NCCP/MSAA/HCP Habitat Reserve. With habitat restoration, this linkage likely would be suitable for the California gnatcatcher. This linkage is in Subarea 4.

VIII. IMPACTS AND RECOMMENDATIONS

A. Probable impacts

The number of individuals of each sensitive species inhabiting the habitat areas was not determined, for the following reasons: (a) many species are amphibians or reptiles, which are difficult to detect during routine field surveys, (b) intensive population studies of small mammals inhabiting the various habitats were not conducted due to the excessive time required to complete such investigations, and (c) some of the bird species known from habitats immediately adjacent to the project area were not observed during field surveys but, due to their capacity of flight, could inhabit the area any time in the future.

DIRECT AND INDIRECT IMPACTS TO VEGETATION

Direct impacts consist of any ground-disturbing activities (i.e., vegetation removal, grading, paving, building of structures, etc.). Impacts will occur to existing habitat. Most of these impacts will occur in the grading by removal of habitat. Direct and indirect disturbance from construction activities could result in the loss or degradation of biological resources from the following ground-disturbing activities:

- Temporary stockpiling of soil or construction materials and sidecasting of soil and other construction wastes;
- Use of designated equipment staging areas (impacts on biological resources are unlikely because locations that are already heavily disturbed, including those that have compacted dirt and gravel, will be used as staging areas);
- Soil compaction, dust, and water runoff;
- Noise disturbance to wildlife species from construction activities; and
- Temporary parking of vehicles outside the construction zone on sites that support sensitive resources (sites not designated as equipment staging areas).

DIRECT AND INDIRECT IMPACTS TO WILDLIFE & PLANTS

The habitat supports common native wildlife species that would be indirectly affected by the construction of the project. This would include common species of reptiles, birds, and small mammals. The more mobile wildlife species, such as birds and larger mammals that utilize the affected area will be displaced during clearing activities to adjacent areas. These animals may move to open adjacent properties. The less mobile species will probably be lost during the clearing and grading. Construction of the project is taking place in previously disturbed areas on the site. Under current field conditions, no endangered or threatened species would be lost from implementation of this project.

Anticipated impacts to most wildlife species would be relatively minor, for the following reason: (a) the project area is previously disturbed by anthropogenic activities.

Allen's Pentachaeta: The project has a low potential to impact Allen's Pentachaeta (*Pentachaeta aurea* ssp. *allenii*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Allen's Pentachaeta are only good for one year. Regardless of the survey results, Allen's Pentachaeta cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Allen's Pentachaeta.***

Big-leaved crownbeard: The project has a low potential to impact Big-leaved crownbeard (*Verbesina dissita*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Big-leaved crownbeard are only good for one year. Regardless of the survey results, Big-leaved crownbeard cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Big-leaved crownbeard.***

California box-thorn: The project has a low potential to impact California box-thorn (*Lycium californicum*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for California box-thorn are only good for one year. Regardless of the survey results, California box-thorn cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of California box-thorn.***

Catalina Mariposa-lily: The project has a low potential to impact Catalina Mariposa-lily (*Calochortus catalinae*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The***

survey results for Catalina Mariposa-lily are only good for one year. Regardless of the survey results, Catalina Mariposa-lily cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Catalina Mariposa-lily.

Cliff malacothrix: The project has a low potential to impact Cliff malacothrix (*Malacothrix saxatilis* var. *saxatilis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Cliff malacothrix are only good for one year. Regardless of the survey results, Cliff malacothrix cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Cliff malacothrix.***

Coulter's saltbush: The project has a low potential to impact Coulter's saltbush (*Atriplex coulteri*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Coulter's saltbush are only good for one year. Regardless of the survey results, Coulter's saltbush cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Coulter's saltbush.***

Fish's milkwort: The project has a low potential to impact Fish's milkwort (*Polygala cornuta* var. *fishiae*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Fish's milkwort are only good for one year. Regardless of the survey results, Fish's milkwort cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Fish's milkwort.***

Intermediate mariposa lily: The project has a low potential to impact Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the***

species does not exist on the site or that the site is not actual or potential habitat of the species. ***The survey results for Intermediate mariposa lily are only good for one year. Regardless of the survey results, Intermediate mariposa lily cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Intermediate mariposa lily.***

Many-stemmed dudleya: The project has a low potential to impact Many-stemmed dudleya (*Dudleya multicaulis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Many-stemmed dudleya are only good for one year. Regardless of the survey results, Many-stemmed dudleya cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Many-stemmed dudleya.***

Nuttall's scrub oak: The project has a low potential to impact Nuttall's scrub oak (*Quercus dumosa*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Nuttall's scrub oak are only good for one year. Regardless of the survey results, Nuttall's scrub oak cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Nuttall's scrub oak.***

Palmer's grappling hook: The project has a low potential to impact Palmer's grappling hook (*Harpagonella palmeri*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Palmer's grappling hook are only good for one year. Regardless of the survey results, Palmer's grappling hook cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Palmer's grappling hook.***

Paniculate Tarplant: The project has a low potential to impact Paniculate Tarplant (*Deinandra paniculata*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area

at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Paniculate Tarplant are only good for one year. Regardless of the survey results, Paniculate Tarplant cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Paniculate Tarplant.***

Small-flowered morning glory: The project has a low potential to impact Small-flowered morning glory (*Convolvulus simulans*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Small-flowered morning glory are only good for one year. Regardless of the survey results, Small-flowered morning glory cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Small-flowered morning glory.***

Thread-leaved brodiaea: The project has a low potential to impact Thread-leaved brodiaea (*Brodiaea filifolia*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Thread-leaved brodiaea are only good for one year. Regardless of the survey results, Thread-leaved brodiaea cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Thread-leaved brodiaea.***

Western dichondra: The project has a low potential to impact Western dichondra (*Dichondra occidentalis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for Western dichondra are only good for one year. Regardless of the survey results, Western dichondra cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Western dichondra.***

White rabbit-tobacco: The project has a low potential to impact White rabbit-tobacco (*Pseudognaphalium leucocephalum*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species***. ***The survey results for White rabbit-tobacco are only good for one year. Regardless of the survey results, White rabbit-tobacco cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of White rabbit-tobacco.***

California glossy snake: The project has a low potential to impact California glossy snake (*Arizona elegans occidentalis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for California glossy snake are only good for one year. Regardless of the survey results, California glossy snake cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of California glossy snake.***

Coast horned lizard: The project has a low potential to impact Coast horned lizard (*Phrynosoma blainvillei*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Coast horned lizard are only good for one year. Regardless of the survey results, Coast horned lizard cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Coast horned lizard.***

Coastal Whiptail: The project has a low potential to impact coastal whiptail (*Aspidoscelis tigris stejnegeri*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for coastal whiptail are only good for one year. Regardless of the survey results, coastal whiptail cannot be taken under State and Federal law. The***

survey report and any mitigation measures included do not constitute authorization for incidental take of coastal whiptail.

Orange-throated whiptail: The project has a low potential to impact Orange-throated whiptail (*Aspidoscelis hyperythra*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Orange-throated whiptail are only good for one year. Regardless of the survey results, Orange-throated whiptail cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Orange-throated whiptail.***

Red-Diamond Rattlesnake: The project has a low potential to impact Red-diamond rattlesnake (*Crotalus ruber*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Red-diamond rattlesnake are only good for one year. Regardless of the survey results, Red-diamond rattlesnake cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Red-diamond rattlesnake.***

San Bernardino ringneck snake: The project has a low potential to impact San Bernardino ringneck snake (*Diadophis punctatus modestus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for San Bernardino ringneck snake are only good for one year. Regardless of the survey results, San Bernardino ringneck snake cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of San Bernardino ringneck snake.***

San Diego ringneck snake: The project has a low potential to impact San Diego ringneck snake (*Diadophis punctatus similis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species***

does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for San Diego ringneck snake are only good for one year. Regardless of the survey results, San Diego ringneck snake cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of San Diego ringneck snake.

Southern California legless lizard: The project has a low potential to impact Southern California legless lizard (*Anniella stebbinsi*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Southern California legless lizard are only good for one year. Regardless of the survey results, Southern California legless lizard cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Southern California legless lizard.***

Two-striped garter snake: The project has a low potential to impact Two-striped garter snake (*Thamnophis hammondi*. This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Two-striped garter snake are only good for one year. Regardless of the survey results, Two-striped garter snake cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Two-striped garter snake.***

Arroyo toad: The project has a low potential to impact Arroyo toad (*Anaxyrus californicus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Arroyo toad are only good for one year. Regardless of the survey results, Arroyo toad cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Arroyo toad.***

California Horned lark: The project has a low potential to impact California Horned lark (*Eremophila alpestris actia*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an

area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for California Horned lark are only good for one year. Regardless of the survey results, California Horned lark cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of California Horned lark.***

Coastal Cactus Wren: The project has a low potential to impact Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Coastal cactus wren are only good for one year. Regardless of the survey results, Coastal cactus wren cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Coastal cactus wren.***

Coastal California gnatcatcher: The project has high potential to impact Coastal California gnatcatcher (*Polioptila californica californica*). **Three coastal California gnatcatchers were observed on one field visit utilizing the site for foraging.** This species is currently utilizing the site for foraging, no nesting habitat is present. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***The survey results for Coastal California gnatcatcher are only good for one year. Regardless of the survey results, Coastal California gnatcatcher cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Coastal California gnatcatcher.***

Cooper's hawk: The project has a low potential to impact Cooper's hawk (*Accipiter cooperii*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Cooper's hawk are only good for one year. Regardless of the survey results, Cooper's hawk cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Cooper's hawk.***

Costa's hummingbird: The project has a low potential to impact Costa's hummingbird (*Calypte costae*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Costa's hummingbird are only good for one year. Regardless of the survey results, Costa's hummingbird cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Costa's hummingbird.***

Golden eagle: The project has a low potential to impact Golden eagle (*Aquila chrysaetos*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Golden eagle are only good for one year. Regardless of the survey results, Golden eagle cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Golden eagle.***

Least Bell's vireo: The project has a low potential to impact Least Bell's vireo (*Vireo bellii pusillus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Least Bell's vireo are only good for one year. Regardless of the survey results, Least Bell's vireo cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Least Bell's vireo.***

Loggerhead shrike: The project has a low potential to impact Loggerhead shrike (*Lanius ludovicianus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Loggerhead shrike are only good for one year. Regardless of the survey results, Loggerhead shrike cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Loggerhead shrike.***

Northern harrier: The project has a low potential to impact Northern harrier (*Circus cyaneus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Northern harrier are only good for one year. Regardless of the survey results, Northern harrier cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Northern harrier.***

Dulzura pocket mouse: The project has a low potential to impact Dulzura pocket mouse (*Chaetodipus californicus femoralis*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Dulzura pocket mouse are only good for one year. Regardless of the survey results, Dulzura pocket mouse cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Dulzura pocket mouse.***

Pallid Bat: The project has a low potential to impact Pallid bat (*Antrozous pallidus*). This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Pallid bat are only good for one year. Regardless of the survey results, Pallid bat cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Pallid bat.***

Western mastiff bat: The project has a low potential to impact Western mastiff bat (*Eumops perotis californicus*. This species is currently not present on the site. However, due to the nature of this species, this species can occupy an area at any time. Should the project site become occupied prior to construction, the project has the potential to impact this species. ***A circumstance of a negative result is not necessarily evidence that the species does not exist on the site or that the site is not actual or potential habitat of the species. The survey results for Western mastiff bat are only good for one year. Regardless of the survey results, Western mastiff bat cannot be taken under State and Federal law. The survey report and any mitigation measures included do not constitute authorization for incidental take of Western mastiff bat.***

B. Cumulative Impacts

The project may affect sensitive biological resources. Some species may utilize several habitat types, or similar microhabitat features contained within different habitat types, during their typical life cycle. Therefore, any habitat-specific impacts discussed below should be considered an approximate description of expected impacts to particular species. Some habitats would only be temporarily disturbed, such as at construction staging sites that are active only during the construction phase of the project. Such temporary disturbance would either kill resident wildlife or displace them into adjacent or more distant habitats, depending on the species. Some of the surviving species would return to the disturbed site following completion of the construction activity.

Temporary indirect impacts would occur to most wildlife species residing in, or using, habitats immediately adjacent to project construction areas, due to increased noise, lighting, dust, human presence or ground vibrations. Depending on the species and the type/intensity of disturbance, diurnal species would be reduced in number or completely displaced. Nocturnal species would be less affected since construction would presumably occur primarily or entirely during the daytime.

The site features disturbed, developed/landscape, *Baccharis pilularis* Alliance, *Baccharis salicifolia* (individual), *Isocoma menziesii* Alliance, *Nicotiana glauca*, *Quercus agrifolia* Alliance, *Cynara cardunculus* Alliance, and Non-Native grassland. The history of anthropogenic disturbances on the project site likely limits its value to native plant and animal species.

C. Recommendations

Based on the identified impacts, the following measures are recommended. Recommendations regarding the time period that implementation of the recommended measures should be completed vary. Therefore, the recommended measures are organized around that timeline. The following recommendations shall be implemented prior to or during site clearing and grading:

Vegetation Communities

This section describes the mitigation measures (MMs) required for impacts to special-status vegetation communities, including jurisdictional areas. These MMs will reduce identified and potential significant impacts to a level which is less than significant pursuant to CEQA, and to comply with conditions of the Orange County Southern Subregion Habitat Conservation Plan (HCP) Biological Opinion.

Impact BIO-1: (Impacts to special-status vegetation communities.) There will be direct impacts to 5.214 acres of *Quercus agrifolia* alliance, a special-status vegetation communities as a result of the proposed project.

MM BIO-1.1: Mitigation for temporary impacts to this community will be through on- site or off-site restoration at a 1:1 ratio to restore impacted special-status vegetation communities to pre-construction conditions. A revegetation plan will be developed, and all revegetation efforts will be consistent with the management plan developed for the HCP for this particular subarea. The revegetation plan shall include a monitoring program, clearly defined success criteria, and contingency measures.

Impact BIO-2: (Impacts to special-status vegetation communities outside of the impact area.)

MM BIO-2.1: To prevent inadvertent disturbance to special-status vegetation communities outside the limits of work, vegetation removal shall be monitored by a biologist and standard best management practices (BMPs) will be implemented. A biologist shall be contracted to perform biological monitoring during all clearing activities.

The following duties shall be carried out by the biological monitor:

1. Review and/or designate the vegetation removal area in the field with the contractor in accordance with the final plan.
2. Be present during initial vegetation clearing, grubbing, and grading
3. Record any advertent impacts to vegetation communities outside the designated construction zone in daily monitoring reports.

Special-Status Wildlife

This section describes the mitigation measures (MMs) required for impacts to special-status wildlife. These MMs will reduce identified and potential significant impacts to a level which is less than significant pursuant to CEQA, and to comply with conditions of the Orange County Southern Subregion Habitat Conservation Plan (HCP) Biological Opinion.

Impact BIO-3: Project construction could result in both direct and indirect impacts to nesting special-status birds (including migratory species), causing injury, or mortality and other adverse effects such as increased stress and nest abandonment. For special-status bird species known or with potential to nest in the study area, direct impacts could include the loss of nests, eggs, and fledglings if vegetation clearing and ground-disturbing activities occur during the nesting season (generally between February 1 and September 30). Indirect impacts such as noise could disrupt breeding activity and potentially result in effects such as nest abandonment, reduced foraging, and increased stress, potentially resulting in reduced reproductive success.

MM BIO-3.1: To prevent inadvertent direct and indirect impacts to special-status birds, the following avoidance measures will be implemented:

1. Pre-construction nest surveys will be conducted within 1 week prior to vegetation clearing if construction occurs during the nesting season of species known or with potential to nest in the study area. Locations of nesting birds will be mapped and appropriate no-work buffers will be established including 500-

foot buffers for listed species such as California gnatcatcher, 500 feet for special-status raptors, and 50-foot buffers for non-listed passerine species.

2. Discuss procedures for minimizing harm to or harassment of wildlife encountered during construction with the contractor and other key construction personnel prior to clearing, grubbing, or grading.

3. Flush special-status species (i.e., avian or other mobile species) from occupied habitat areas during the non-breeding season immediately prior to brush-clearing and earth-moving activities.

Jurisdictional Waters/Streambed

This section describes the mitigation measure (MM) required to reduce impacts to jurisdictional waters/streambed to a level which is less than significant pursuant to CEQA, and to comply with conditions of the HCP Biological Opinion. Additional or more specific mitigation requirements may be required to obtain the required Clean Water Act (CWA) Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB), to obtain a Section 404 Permit from U.S. Army Corps of Engineers (ACOE)*[5], and to obtain a California Fish and Game Code Section 1602 Streambed Alteration Agreement (SAA) from CDFW.

Impact BIO-4: (Impacts to jurisdictional streambed and waters.) Impacts to jurisdictional streambed and waters habitats will be mitigated as described under MM BIO-1.1 above. In addition, the following MM is required.

MM BIO-4.1: To comply with the state and federal regulations for impacts to "waters of the United States and state," the following agency permits are required, or verification that they are not required shall be obtained.
The following permit and agreement shall be obtained:

- A CWA, Section 401/404 permit issued by the California RWQCB and the ACOE for all project-related disturbances of waters of the United States and/or associated wetlands.
- A Section 1600 SAA issued by the CDFW for all project-related disturbances of any streambed.

Impact BIO-5: (Impacts to jurisdictional waters outside of impact area.) This impact will be mitigated through MM BIO- 2.1 described above.
MM BIO-5.1: This impact will be mitigated through MM BIO- 2.1 described above.

[5] Project is in a Special Area Management Plan for ACOE. There are no nationwide permits authorized for the area.

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B. Persons contacted

- California Department of Fish and Game, Region 5 San Diego office was contacted regarding potential sensitive species in the area. We were directed to use the CNDDB species list. Please see Figure 6 and Table 2.
- October 22, 2019 U.S. Fish and Wildlife Service, Carlsbad Field Office was contacted regarding potential sensitive species in the area. The species list is on page 20.

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XII. LIST OF SITE PHOTOS


Tarzona
Tabuenca
Fonda
Olympiad Rd
La Paz Rd
Felipe Rd
Robert A
Curtis Park
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Project Boundary
PHOTO LOCATIONS
CURTIS PARK
Gonzales Environmental Consulting, LLC
0
300
Feet

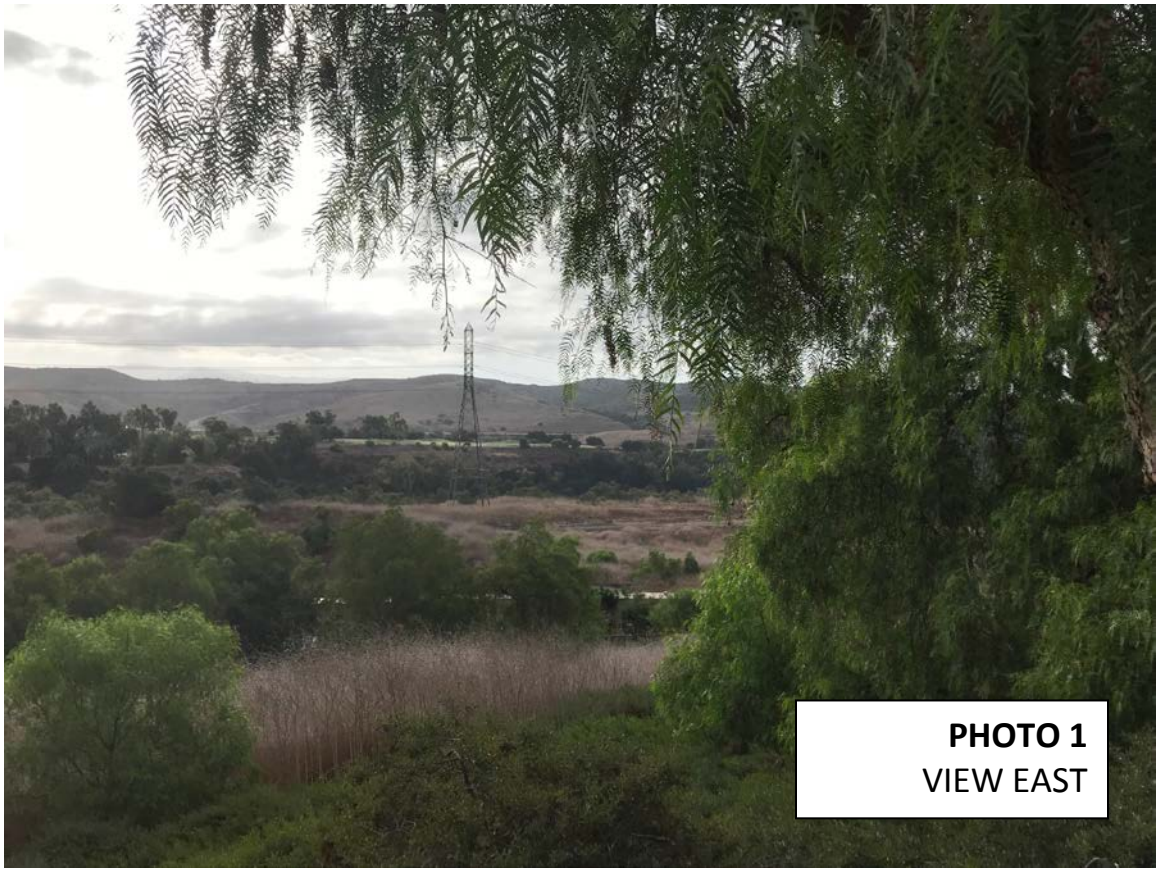


PHOTO 1
VIEW EAST



PHOTO 2
VIEW NORTH



PHOTO 3
VIEW EAST



PHOTO 4
VIEW NORTHEAST



PHOTO 5
VIEW SOUTH



PHOTO 6
VIEW EAST



PHOTO 7
VIEW SOUTH



PHOTO 8
VIEW WEST



PHOTO 9
VIEW SOUTHWEST



PHOTO 10
VIEW WEST



PHOTO 11
VIEW SOUTHEAST



PHOTO 12
VIEW WEST



PHOTO 13
VIEW WEST



PHOTO 14
VIEW WEST



PHOTO 15
VIEW NORTHEAST

XIII. APPENDICES

A. Flora and Fauna Compendia
B. Streambed Delineation Report
C. USFWS letter

XIV. CERTIFICATION

CERTIFICATION*: "I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project."*

DATE: __11-3-19_____ SIGNED: 

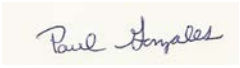
1) Teresa Gonzales

1) Fieldwork Performed By:



Teresa Gonzales

2) Fieldwork Performed By:



Paul Gonzales

Check here _____ If Adding any additional Names/Signatures, below or on other side of page.

Appendix A
Plant and Animal Compendia

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
ADOXACEAE			
Sambucus nigra ssp. *caerulea*	Blue elderberry	U	Native
AMARANTHACEAE			
Amaranthus albus	Tumbleweed	U	Non-Native
ANACARDIACEAE			
Rhus integrifolia	Lemonade berry	U	Native
Schinus molle	California pepper tree	C	Non-Native
ASTERACEAE			
Ambrosia psilostachya	Ragweed	U	Native
Artemisia californica	California sagebrush	U	Native
Artemisia douglasiana	California mugwort	U	Native
Artemisia dracunculus	Tarragon	U	Native
Baccharis pilularis	Coyote bush	C	Native
Baccharis salicifolia	Mulefat	C	Native
Brickellia californica	California brickellbush	U	Native
Corethrogyne filaginifolia	Common sandaster	U	Native
Carduus pycnocephalus	Italian thistle	U	Non-Native
Cynara cardunculus	Artichoke thistle	C	Non-Native
Centaurea melitensis	Tocalote	C	Non-Native
Erigeron foliosus	Leafy daisy	U	Native
Erigeron canadensis	Canada horseweed	U	native
Eriophyllum confertiflorum	Golden yarrow	U	Native
Matricaria discoidea	Pineapple weed	C	Native
Grindelia camporum	Gumweed	U	Native
Helianthus gracilentus	Slender sunflower	U	Native
Heterotheca grandiflora	Telegraph weed	U	Native
Isocoma menziesii	Menzie's goldenbush		
Porophyllum gracile	Odora	U	Native
Pseudognaphalium californicum	Ladies' tobacco	U	Native
Pseudognaphalium microcephalum	Feltleaf everlasting	U	Native
Silybum marianum	Milk thistle	U	Non-Native
Sonchus asper	Spiny sowthistle	U	Non-Native
Sonchus oleraceus	Sowthistle	U	Non-Native
Oncosiphon piluliferum	Stinknet	C	Non-Native
Stephanomeria diegensis	Wreathplant	C	Native
Osmadenia tenella	False rosinweed	U	Native
Lactuca serriola	Prickly lettuce	U	Non-Native
Logfia gallica	Narrowleaf cottonrose	U	Non-Native
Rafinesquia californica	California chicory	U	Native

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
Solidago velutina	Threenerve goldenrod	U	Native
Taraxicum officionale	Dandelion	C	Non-Native
Xanthium strumarium	Rough cocklebur	C	Native
BRASSICACEAE			
Brassica nigra	Black mustard	U	Non-Native
Hirschfeldia incana	Short podded mustard	C	Non-Native
Sinapis arvensis	Charlock	U	Non-Native
CHENOPODIACEAE			
Kochia scoparia	Summer cypress	U	Non-native
Salsola tragus	Russian thistle	C	Non-native
EUPHORBIACEAE			
Euphorbia albomarginata	Rattlesnake sandmat	C	Native
Croton setigerus	Turkey mullein	C	Native
Ricinus communis	Castor bean	C	Non-Native
GERANIACEAE			
Erodium cicutarium	Coastal Heron's Bill	A	Non-Native
CACTACEAE			
Cylindropuntia californica	California cholla	U	Native
Opuntia littoralis	Coast prickly pear	U	Native
FAGACEAE			
Quercus agrifolia	Coast live oak	U	Native
OLEACEAE			
Olea europaea	Olive shrub	C	Non-Native
PLANTAGINACEAE			
Plantago erecta	California plantain	U	Native
POLYGONACEAE			
Eriogonum fasciculatum	California buckwheat	C	Native
RHAMNACEAE			
Frangula californica	California coffeeberry	U	Native
RUBIACEAE			
Galium parisiense	Wall bedstraw	U	Non-Native
SALICACEAE			
Salix lasiolepis	Arroyo willow	U	Native
SOLANACEAE			
Datura wrightii	Jimsonweed	U	Native
Nicotiana glauca	Tree tobacco	C	Non-Native
TAMARICACEAE			
Tamarix ramosissima	Salt cedar	U	Non-Native
URTICACEAE			
Urtica dioica	Stinging nettle	C	Native
Urtica urens	Dwarf nettle	U	Non-Native

Scientific name	Common name	Estimated abundance within project site*	Native/Non-Native
ZYGOPHYLLACEAE			
Tribulus terrestris	Puncture vine	U	Non-Native
ARECACEAE			
Washingtonia robusta	Mexican fan palm	U	Non-Native
ASPARAGACEAE			
Yucca gloriosa	Spanish dagger	U	Non-Native (landscape)
Yucca filamentosa	Adam's needle	U	Non-Native (landscape)
POACEAE			
Avena barbata	Slender Wild Oat	C	Non-Native
Avena fatua	Wild Oat	U	Non-Native
Bromus diandrus	Ripgut brome	C	Non-Native
Bromus hordeaceus	Soft Chess	C	Non-Native
Bromus madritensis ssp. rubens	Foxtail Chess	U	Non-Native
Cortaderia jubata	Pampas grass	U	Non-Native

Legend:

** AbundanceDefinitions*
A=Abundant: observed or expected to occur in substantial numbers (>500 observations) in suitable habitat and in the appropriate season;
C=Common: observed or expected to occur in high numbers (100-500 observations) in suitable habitat and in the appropriate season;
u=Uncommon: observed or expected to occur in low numbers (10-100 observations) in suitable habitat and in the appropriate season; may be restricted to few habitat types;
R=Rare: observed or expected to occur in very low numbers (<10 observations) in suitable habitat and in the appropriate season; restricted to specific habitat types

**Special Status Plant

AVIAN SPECIES OBSERVED ON THE PROJECT SITE

SCIENTIFIC NAME	COMMON NAME	SPECIAL STATUS/REGIONAL STATUS	NATIVE SPECIES	OBSERVATION TYPE	POPULATION SIZE (OBSERVED #/# OF VISITS)[1]
AVES	**BIRDS**				
ACCIPITRIDAE	**HAWK**				
Buteo jamaicensis	Red-tailed Hawk	No	Yes	Visual	2
FALCONIDAE	**FALCON**				
Falco sparverius	American kestrel	No	Yes	Visual	1
COLUMBIDAE	**PIGEONS AND DOVES**				
Streptopelia decaocto	Eurasian Collared Dove	No	No	Visual	3
Zenaida macroura	Mourning Dove	No	Yes	Visual	8
CUCULIDAE	**CUCKOOS AND ROADRUNNERS**				
Geococcyx californianus	Greater roadrunner	No	Yes	Visual	1
CORVIDAE	**CROWS & JAYS**				
Corvus corax	Common raven	No	Yes	Visual	6
Corvus brachyrhynchos	American crow	No	Yes	Visual	2
TROGLODYTIDAE	**WRENS**				
Troglodytes bewickii	Bewick's wren	No	Yes	Visual	1
TROCHILIDAE	**HUMMINGBIRD**				
Calypte anna	Anna's Hummingbird	No	Yes	Visual	4
HIRUNDINIDAE	**SWALLOWS**				
Stelgidopteryx serripennis	Northern Rough-winged swallow	No	Yes	Visual	4
PICIFORMES	**WOODPECKER**				
Melanerpes formicivorus	Acorn Woodpecker	No	Yes	Visual	2
AEGITHALIDAE	**BUSHTITS**				
Psaltriparus minimus	Bushtit	No	Yes	Visual	10
FRINGILLIDAE	**FINCHES**				
Carpodacus mexicanus	House finch	No	Yes	Visual	5
POLIOPTILIDAE	**GNATCATCHER**				
Polioptila californica californica	Coastal California gnatcatcher	Yes	Yes	Visual	3
MIMIDAE	**MIMIC THRUSHES, OR MIMIDS**				
Mimus polyglottos	Northern Mockingbird	No	Yes	Visual	4
SYLVIIDAE	**WARBLERS AND PARROTBILL**				
Chamaea fasciata	Wrentit	No	Yes	Visual	1
STURNIDAE	**STARLINGS**				
Sturnus vulgaris	European starling	No	No	Visual	3
EMBERIZIDAE	**SPARROWS AND TOWHEES**				

[1] Population size determined by the following formula: number of species divided by number of visits

SCIENTIFIC NAME	COMMON NAME	SPECIAL STATUS/REGIONAL STATUS	NATIVE SPECIES	OBSERVATION TYPE	POPULATION SIZE (OBSERVED #/# OF VISITS)[1]
Melozone crissalis	California towhee	No	No	Visual	3
Melospiza melodia	Song sparrow	No	No	Visual	2
PASSERELLIDAE	**OLD WORLD SPARROWS**				
Passer domesticus	House Sparrow	No	No	Visual	2

Legend:
CDFW=California Department of Fish and Wildlife
SSC=California Species of Concern
FP=Fully Protected
WL=Audubon watch list

AMPHIBIAN AND REPTILE SPECIES OBSERVED ON THE PROJECT SITE

SCIENTIFIC NAME	COMMON NAME	SPECIAL STATUS/REGIONAL STATUS	NATIVE SPECIES	OBSERVATION TYPE	POPULATION SIZE (OBSERVED #/# OF VISITS)[2]
Hylidae	**Tree Frog**				
Pseudacris hypochondriaca	Baja California Tree Frog	**No**	**Yes**	**Visual**	**1**
Anguidae	**Alligator Lizard**				
Elgaria multicarinata	Southern Alligator Lizard	**No**	**Yes**	**Visual**	**3**
Phrynosomatidae	**Side-blotch Lizard**				
Uta stansburiana	Common Side-blotched Lizard	**No**	**Yes**	**Visual**	**2**
Sceloporus occidentalis	Western Fence Lizard	**No**	**Yes**	**Visual**	**3**
Colubridae	**Gopher Snake**				
Pituophis catenifer	Gopher Snake	**No**	**Yes**	**Visual**	**1**
Lampropeltis californiae	California King Snake	**No**	**Yes**	**Visual**	**1**
Viperidae	**Vipers**				
Crotalus oreganus	Western Rattlesnake	**No**	**Yes**	**Visual**	**1**

[2] Population size determined by the following formula: number of species divided by number of visits

MAMMAL SPECIES OBSERVED OR EXPECTED TO OCCUR ON THE PROJECT SITE

Scientific Name	Common Name	Special Status/Regional Status	Native Species	OBSERVATION TYPE/EXPECTATION TO OCCUR*	Population Size (observed #/# of visits)[3]
FAMILY LEPORIDAE	**RABBITS & HARES**				
Sylvilagus audubonii	Desert cottontail	No	Native	Visual	1
FAMILY SCIURIDAE	**GROUND SQUIRREL**				
Otospermophilus beecheyi	California ground squirrel	No	Native	Visual	2
FAMILY CERVIDAE	**MULE DEER**				
Odocoileus hemionus	Mule deer	No	Native	Visual	1
FAMILY CANIDAE	**DOG, WOLF & FOX**				
Canis latrans	Coyote	No	Native	Visual	1
Canis familiaris	Dog	No	Non-Native	Visual	3
FAMILY FELIDAE	**CAT**				
Felis domesticus	Cat	No	Non-Native	Visual	3

[3] Population size determined by the following formula: number of species divided by number of visits

Appendix B
Jurisdictional Delineation

Delineation of Waters of the United States and Department of Fish and Wildlife Jurisdictional Habitats for

APN 786-601-01

In

City of Mission Viejo, Orange County, CA

USGS 7.5-minute topographic quadrangle map San Juan Capistrano in Section 32 of Township 6 South, Range 7 West



Prepared By:

GONZALES
ENVIRONMENTAL CONSULTING, LLC

358 Crystal Drive
San Jacinto, CA 92583
(760) 777-1621

Report Date: November 3, 2019

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1. TITLE PAGE

A. Date report prepared: November 3, 2019

B. Report Title: Delineation of Waters of the United States and Department of Fish and Wildlife Jurisdictional Habitats for APN 786-601-01 in City of Mission Viejo, Orange County, CA

C. Project site location: USGS 7.5-minute San Juan Capistrano topographic quadrangle map in Section 32 of Township 6 South, Range 7 West

D. Location(s): Curtis Park

E. Owner/Applicant:
City of Mission Viejo

F. Principal Investigator(s): Gonzales Environmental Consulting, LLC
Address: 358 Crystal Drive
San Jacinto, CA 92583
Phone: 760.777-1621

G. Name and phone number of person preparing report and of all persons who performed fieldwork on the site

Name of Person	Role on project
Teresa Gonzales	Prepared report and performed fieldwork
Paul Gonzales	Performed fieldwork

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: 11-3-19

Teresa Gonzales

Acronyms and Abbreviations

USACE	U.S. Army Corps of Engineers
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
GIS	Geographic Information System
GPS	Global Positioning System
HA	Hydrologic Area
HR	Hydrologic Region
HU	Hydrologic Unit
HUC	Hydrologic Unit Codes
HUC 8	Hydrologic Unit Codes the finest level of examination
LSAA	Lake or Streambed Alteration Agreement
NEPA	National Environmental Policy Act
NRCS	National Resource Conservation Society
NWP	Nationwide Permit
OHWM	ordinary high water mark
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
RWQCB	State Water Resources Control Board, Santa Ana Region

This document should be cited as:
Gonzales Environmental Consulting, LLC. 2019. Delineation of Waters of the United States and Department of Fish and Wildlife Jurisdictional Habitats for APN 786-601-01 in City of Mission Viejo, Orange County, CA; USGS 7.5-minute San Juan Capistrano topographic quadrangle map in Section 32 of Township 6 South, Range 7 West. November 3, 2019. Mission Viejo, California. Prepared for City of Mission Viejo.

2. INTRODUCTION

This report contains the results of a streambed/wetland delineation conducted for U.S. Army Corps of Engineers (USACE), California Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (DFW) jurisdiction for APN 786-601-01 City of Mission Viejo, Orange County, California. [1]

This report presents the findings of a delineation of wetlands and waters of the United States and California Department of Fish and Wildlife (CDFW) for the proposed project. The information presented in this report is intended to assist the U.S. Army Corps of Engineers (USACE) determine the extent of jurisdictional Waters of the U.S. within the proposed project area. Data have been collected in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and additional supplemental manuals (USACE 1987, 2008a, and 2008b). This report is also intended to aid the California Department of Fish and Wildlife (CDFW) with determination of the extent of jurisdictional habitats in the project and City of Mission Viejo with determination of the extend of jurisdictional habitats.

[1] This report presents the best effort at estimating the subject jurisdictional boundaries using the most up-to-date regulations and written policy and guidance from the ACOE, RWQCB, and DFG. Only ACOE, RWQCB, and DFG can make a final determination of jurisdictional boundaries.

3. PROJECT AND PROPERTY DESCRIPTION

3. 1 Project Description

The project site (site) discussed in this report is located east of Felipe Road/Olympiad Road, north and south of what would be the continuation of La Paz Road, and south of what would be the continuation of Escaltron (Figures 1, 2, 3).

The site is located within San Bernardino Meridian in portions of Section 32 in Township 6 South, Range 7 West in Orange County, California (Figures 1, 2 and 3). This location is shown on the San Juan Capistrano, California 7.5-minute U.S. Geological Survey (USGS) quadrangle (San Juan Capistrano Photorevised 1981). The approximate center of the site is located at -117.631663˚west and latitude 33.631663˚north.

The western portion of the site (Robert A. Curtis Park) is slightly sloping to the east. The eastern portion of the site is steeply sloping to slightly sloping towards the project's eastern boundary. The site occurs at an elevation between 652 and 797 feet above mean sea level (msl). The developed portion of the site (Robert A. Curtis Park) (Park) includes baseball fields, parking, restrooms, maintenance buildings and landscaping. A landscape storage area is located in the northern portion of the site, east of the entrance to the Park. West of the Park is single-family residential housing.

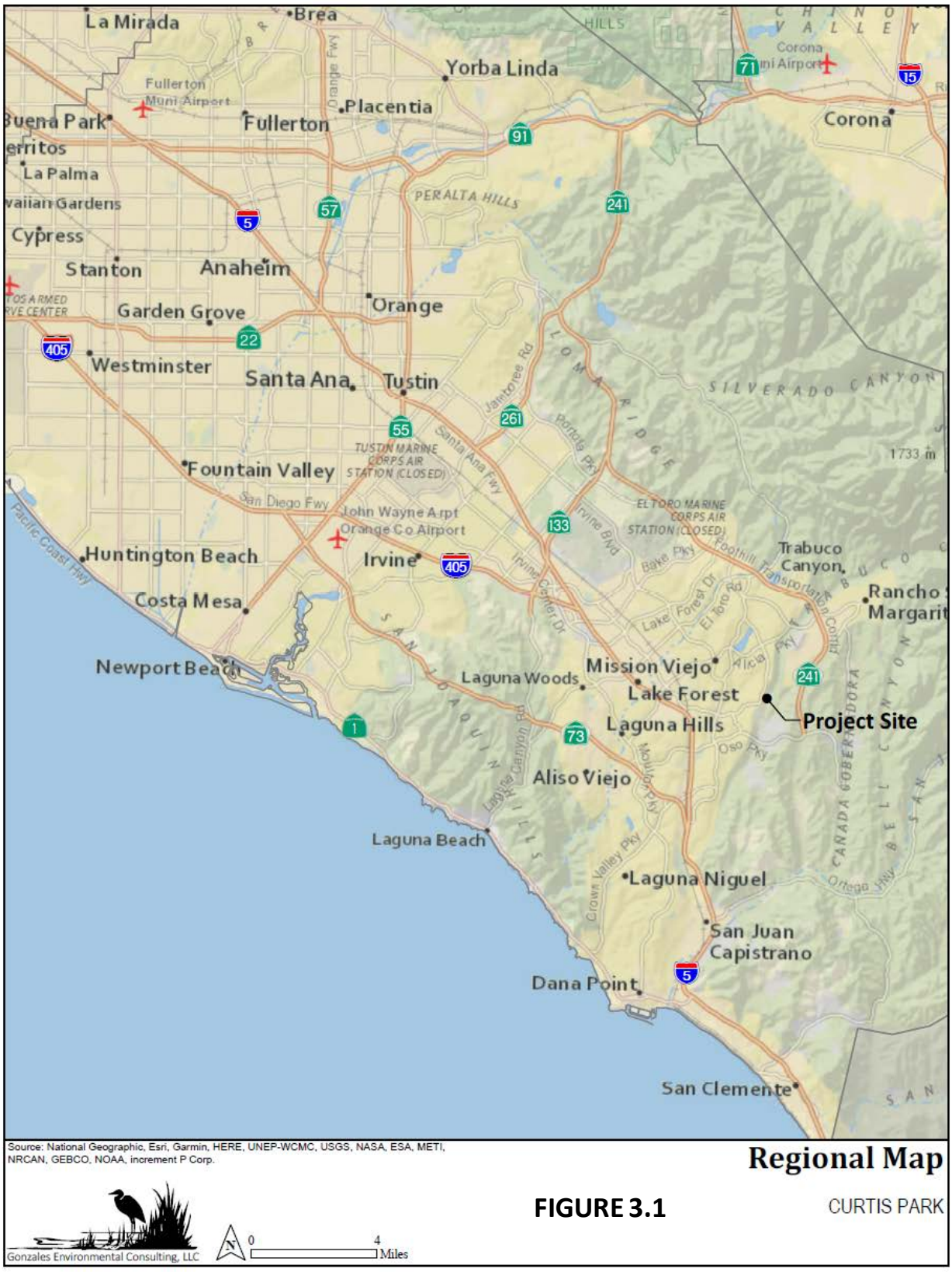
The non-improved portion of the site is covered with 6-7 foot tall vegetation consisting of native wreath plant (*Stephanomeria diegensis*) and Canada horseweed (*Erigeron canadensis*) and non-native black mustard (*Brassica nigra*). A stand of Menzies goldenbush (*Isocoma menziesii*) Alliance is located above Drainage 2. Pockets of native vegetation mixed with non-native exotics are found throughout the site.

Drainage 1 is located in the northern portion of the project site and begins with an over the side drainage inlet from Olympiad Road near the entrance to the Park. This drainage has native plants California fan palm (*Washingtonia filifera*), coast live oak (*Quercus agrifolia*), arroyo willow (*Salix lasiolepis*), and coyote bush (*Baccharis pilularis*) dominated by non-native species Mexican fan palm (*Washingtonia robusta*), and pampas grass (*Cortaderia jubata*). The drainage hydrologically connects to Arroyo Trabuco. Soils are consistent with mapping and contain clay loam.

Drainage 2 is a forked drainage with both forks starting at the edge of the park (one at the southeastern edge (T-1) and the other at the eastern edge of the landscape/maintenance area. This drainage contains primarily non-natives Artichoke thistle (*Cynara cardunculus*), Castor bean (*Ricinus communis*) and Black mustard (*Brassica nigra*) until reaching their confluence. Smaller sized Coast live oak trees are located in scattered areas in and around T-1. Once merged coast live oak, arroyo willow, lemonade berry (*Rhus integrifolia*) and stinging nettle (*Urtica dioica*) are the dominant species. The drainage hydrologically connects to Arroyo Trabuco. Soils in both forks of Drainage 2 consist of clay soils and are consistent with what is mapped.

Drainage 3 starts with an over the side inlet from Olympiad Road across from La Paz Road. D-3 splits into two channels midway down slope. One channel merges with D-2 and the other hydrologically connects directly to Arroyo Trabuco. Both forks of Drainage 3 contain primarily non-native Artichoke thistle until midway down slope. Smaller sized Coast live oak trees and Blue elderberry (*Sambucus nigra* ssp. *caerulea*) are located in scattered areas in and around both forks of D-3. Once merged coast live oak, arroyo willow, lemonade berry (*Rhus integrifolia*) and stinging nettle (*Urtica dioica*) are the dominant species. Soils in both forks of Drainage 3 consist of clay soils and are consistent with what is mapped.

The locations of the native plant communities within the project footprint have been impacted by anthropogenic activities in the area.
Potential rare, and/or endangered or otherwise sensitive habitats associated with the proposed project site include Southern Coast Live Oak Riparian Forest, western spadefoot (*Spea hammondii*), coastal California gnatcatcher (*Polioptila californica californica*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), Dulzura pocket mouse (*Chaetodipus californicus femoralis*), southern California legless lizard (*Anniella stebbinsi*), California glossy snake (*Arizona elegans occidentalis*), San Bernardino ringneck snake (*Diadophis punctatus modestus*), two-striped gartersnake (*Thamnophis hammondii*), coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), and red-diamond rattlesnake (*Crotalus ruber*).



Regional Map

FIGURE 3.1

CURTIS PARK

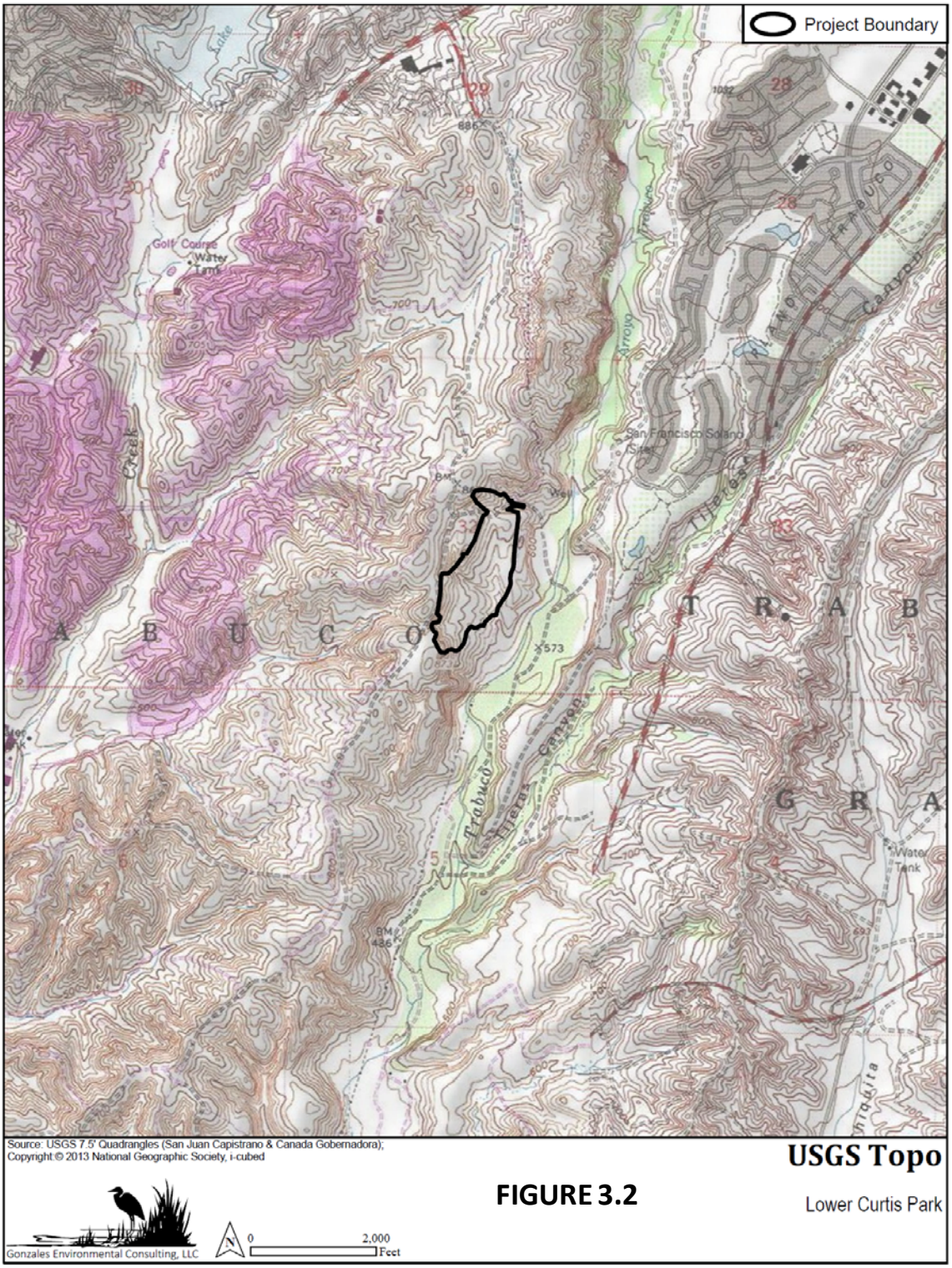

Project Boundary
Golf Course
Water Tank
Trabuco Canyon
San Francisco Solano Trail
Trabuco Creek
A B U C O
T R A B
G R A
Water Tank
Source: USGS 7.5' Quadrangles (San Juan Capistrano & Canada Gobernadora);
Copyright © 2013 National Geographic Society, i-cubed
Gonzales Environmental Consulting, LLC
N
0
2,000
Feet
USGS Topo
Lower Curtis Park

FIGURE 3.2


Tarzona
Tabuenca
Fonda
Robert A
Curtis Park
Olympiad Rd
La Paz Rd
Felipe Rd
Project Boundary
Aerial Photograph
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

FIGURE 3.3

3. 2 Environmental Setting

The project area is in the coastal foothills of eastern Orange County. To the west are the coastal terraces in the San Clemente to Corona Del Mar areas; east are the Santa Ana Mountains. Slopes range from 9-50%. The soils formed in material weathered from calcareous sandstone and shale. The average annual rainfall for the area ranges from 12-20 inches. The average annual temperature is 59-62 degrees, with 300-350 frost-free days.[2]

The project site is east of FelipeRoad/Olympiad Road, north and south of what would be the continuation of La Paz Road and south of what would be the continuation of Escaltron. Unnamed Drainage 1 is located in the northern portion of the project site and flows west to east until leaving the project site. Unnamed Drainage 2 is a forked drainage with both forks starting at the edge of the park (one at the southeastern edge (T-1) and the other at the eastern edge of the landscape/maintenance area. Unnamed Drainage 3 starts with an over the side inlet from Olympiad Road across from La Paz Road. D-3 splits into two channels midway down slope. One channel merges with D-2 and the other hydrologically connects directly to Arroyo Trabuco. Access to the project site is uncontrolled, except for a locked gate going to the landscape/maintenance area (which controls automobile traffic only). The majority of the project site has been disturbed by various anthropogenic disturbances. Drainages and vegetation have been disturbed by access and adjacent land uses. During our site visits we personally observed walkers, dog walkers, and mountain bikers accessing the site. Tracks and trails traverse the site, degrading plant and animal habitat.

Land immediately adjacent to the site's western boundary is developed with single family housing. Land to the north includes Bebee Park and Mission Viejo Skatepark. Land use to the east is open space (O'Neill Regional Park) and part of the Arroyo Trabuco trail. The land to the south consists of water tower and James G. Gilleran Park. The project will impact public/quasi-public (PQP) land (Robert A. Curtis Park).

3. 3 Hydrology

The entire project site falls within the Arroyo Trabuco San Juan Capistrano watershed (HUC 18070301). The waters of the U.S. found on the project site are eventually tributary to the Pacific Ocean. The hydrology in the project area has been altered. The three unnamed drainages and tributaries are ephemeral streams (have less flow than intermittent streams, are typically shallow, and have flowing water for brief periods in response to rainfall. Ephemeral streams and ditches are normally dry for most of the year).

3. 4 Vegetation

The site consists of vegetation communities, characterized as *Baccharis pilularis* Alliance, *Baccharis salicifolia*, *Isocoma menziesii* Alliance, *Nicotiana glauca*,

2 United States Department of Agriculture Soil Conservation Service. 1978. Soil Survey Orange County and Western Riverside Area California. 158 pp.,illus.

Quercus agrifolia Alliance, Non-native *Cynara cardunculus* Alliance, Non-native grassland, disturbed habitat, and developed/landscape. The locations of the native plant communities within the project footprint have been impacted by anthropogenic activities in the area. The existing plant communities are described in more detail below.

Baccharis pilularis Alliance

Plants occur as a dominant or co-dominant in a number of shrubland alliances in California and make up the *Baccharis pilularis* shrubland alliance when they are > 50% of the shrubland's absolute cover (Sawyer et al. 2009). The shrubs tend to be in the more early seral stages of forest vegetation development in the north than in the south. In northern CA and OR, plants can be a dominant in various scrub plant communities on coastal bluffs, in coastal prairies, and oak woodlands, but less frequent on coastal dunes. In southern CA, plants tend to be less dominant members of coastal sage scrub and grassland communities but can dominate patches of vegetation in particular microsites (Steinberg 2002). In southern CA shrublands, plants may sometimes be co-dominant with *Artemisia californica*, *Salvia mellifera* , or *Lotus scoparius* var. *scoparius*.

Baccharis salicifolia

Baccharis salicifolia is a flowering shrub native to the desert southwest of the United States and northern Mexico, as well as parts of South America. Its usual common name is mule fat; it is also called seepwillow or water-wally. This is a large bush with sticky foliage which bears plentiful small, fuzzy, pink or red-tinged white flowers. The long pointed leaves may be toothed. It is most common near water sources. On the project site *Baccharis salicifolia* exists as monotypic patches. Monotypic patches were mapped separately.

Isocoma menziesii Alliance

Menzies' goldenbush scrub (Gray and Bramlett 1992) is a plant association which is dominated by coastal goldenbush *(Isocoma menziesii* var. *menziesii*). It is not a plant community identified in Holland (1986) and would typically be included in the California sage scrub community for mapping purposes. It has been separated from California sage scrub in this report because it supports nearly monotypic patches of coastal goldenbush and appears on the slope above part of Drainage 2. In this instance, it intergrades with non-native grasslands. The *Isocoma menziesii* var. *menziesii* (Menzies goldenbush scrub) alliance has a rank of G4-S4-1 in CDFW (2019), meaning that it is apparently secure both globally and within the state but that more data is needed to confirm. Because this alliance is considered a sub-association of California sagebrush scrub, which is the obligate habitat type for the federally listed threatened California gnatcatcher, it is considered a special-status vegetation community.

Nicotiana glauca

Nicotiana glauca (tree tobacco) is a tree/shrub (family Solanaceae), which stands 10-20 feet tall and is short-lived. Tree tobacco was introduced to California about 100 years ago and is found growing up to 5,000 feet in

disturbed soils, vacant lots, along roadsides, streamsides, and other riparian areas. On the project site *Nicotiana glauca* exists as monotypic patches and on edges of *Quercus agrifolia* Alliance. Monotypic patches were mapped separately.

Quercus agrifolia Alliance

Habitat dominated by one tree, coast live oak (*Quercus agrifolia*), which is evergreen and reaches 10-25 meters in height. The shrub layer is poorly developed, but may include poison oak, elderberry, and sugar bush. The herb component is continuous and dominated by introduced taxa. Typically found on north facing slopes and shaded ravines in the south (Holland). This habitat dominates the lower aspects of Drainage 1, 2 and 3.

Non-native *Cynara cardunculus* Alliance

Cynara cardunculus (artichoke thistle) is a large perennial thistle (family Asteraceae) found below 500 meter elevations throughout California, except in the Great Basin and Desert Regions. Artichoke thistle prefers disturbed open sites, including grassland, chaparral, coastal scrub, and riparian areas. This habitat dominates the upper aspects of Drainage 2 and 3 and aspects below developed park area.

Non-native grassland

California annual grassland is characterized by a mixture of weedy, introduced annuals, primarily grasses. It may occur where disturbance by maintenance (mowing, scraping, discing, spraying, etc.), repetitive fire, agriculture, or other mechanical disruptions have altered soils and removed native seed sources from areas formerly supporting native vegetation. Holland (1986) states that California annual grasslands have a sparse to dense cover of annual grasses that is typically 0.2–0.5 meter (0.7–1.6 feet) tall and can be up to 1 meter (3 feet) tall. Wildflowers are often associated with California annual grasslands, especially in years with favorable precipitation (Holland 1986). According to Holland (1986) and the List of Terrestrial Natural Communities (CDFG 2003), grasses that occur in California annual (non-native) grasslands include oats (*Avena* spp.), bromes(*Bromus* spp.), fescue (*Vulpia* spp.), and Italian ryegrass (*Lolium perenne* ssp. *multiflorum*). Forbs that occur with these grasses include California poppy (*Eschscholzia californica*), filaree (*Erodium* spp.), goldfields (*Lasthenia* spp.), phacelia (*Phacelia* spp.), gilias (*Gilia* spp.), and baby blue-eyes (*Nemophila menziesii*). California annual (non-native) grassland also includes land that is used as pasture for grazing purposes. Grasses such as barley (*Hordeum* spp.) and wild oats (*Avena* sp.) may grow in these areas. This land has very few native species. In his description of California annual (non-native) grassland, Holland (1986) states that this habitat type typically occurs on fine-textured clay soils. Sites are often moist or waterlogged during the winter rainy season and very dry during the summer and fall months. Adjacent areas with moister, better-drained soils often support oak woodland. According to Sawyer and Keeler-Wolf (1995), California annual (non-native) grasslands occur in uplands of all topographic orientation. On the project site it is the dominant habitat.

Disturbed

Disturbed land includes areas that experience or have experienced high levels of human disturbance unpaved roads, trails, and graded areas. Vegetation in these areas, if present at all, is usually sparse and dominated by non-native weedy herbaceous species. Within the study area, disturbed land includes trails and bare, open areas with less than 20% vegetative cover. Disturbed land is not included in the List of California Vegetation Alliances and Associations (CDFW 2019). This community is not considered a special-status vegetation community. The disturbed area on the project site encompasses the existing park, roads and utility areas.

Developed/Landscaped

Areas mapped as developed/landscaped include planted areas where ornamental landscaping has been installed as part of a recreational park, development, or roadway landscaping. Developed/landscaped is not included in the List of California Vegetation Alliances and Associations (CDFW 2019). Since it is dominated by non-native ornamental plantings, developed/landscaped land has limited value and is not considered a special-status vegetation community.

TABLE 3.1
SUMMARY OF HABITAT TYPE AND PROJECT ACREAGE

Vegetation	Boundary
Baccharis pilularis Alliance	0.009
Baccharis salicifolia	0.068
Developed/Landscape	2.078
Disturbed Habitat	1.250
Isocoma menziesii Alliance	0.261
Nicotiana glauca	0.226
Non-native *Cynara cardunculus* Alliance	2.465
Non-native Grassland	31.678
Quercus agrifolia Alliance	5.124
TOTAL (acres)	**43.159**

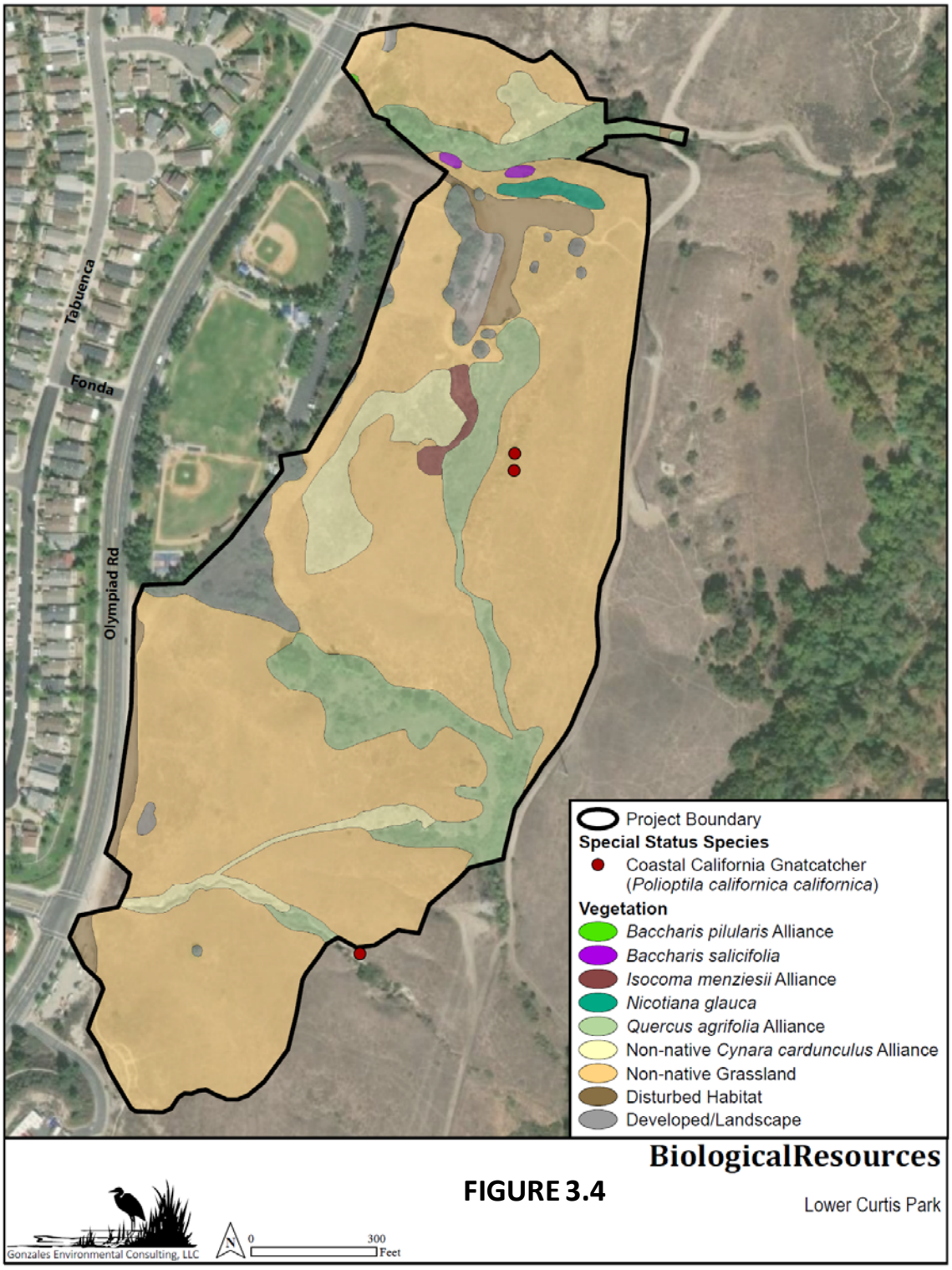

Tabuenca
Fonda
Olympiad Rd
Project Boundary
Special Status Species
Coastal California Gnatcatcher
(Polioptila californica californica)
Vegetation
Baccharis pilularis Alliance
Baccharis salicifolia
Isocoma menziesii Alliance
Nicotiana glauca
Quercus agrifolia Alliance
Non-native Cynara cardunculus Alliance
Non-native Grassland
Disturbed Habitat
Developed/Landscape
BiologicalResources
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

FIGURE 3.4

3.5 Soils

The soil series mapped for the area are shown in Figure3.5. The soil associations mapped for the area are Alo-Bosanko association. Alo-Bosanko association soils are strongly sloping to steep, well drained clays on coastal foothills. The soils formed in material weathered from calcareous sandstone and shale. Slopes are 9-50%. The plant cover consists of annual grasses, mustard, and other forbs. Elevation ranges from 200-2,500 feet. The average annual rainfall is 12-20 inches, and the average annual air temperature is 59-62 degrees F. The frost-free season is 300 to 350 days. The soil series mapped for the area are described in Table 3.2. The soils found are similar in texture and color to those mapped. The soils were compacted and unstratified over portions of the project site.

TABLE 3.2

SOIL SERIES MAPPED FOR THE AREA

Symbol	Name	Description
126	Bosanko clay, 9 to 15 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 9-15%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
127	Bosanko clay, 15 to 30 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 15-30%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
128	Bosanko clay, 30 to 50 percent slopes	Consists of well drained soils on foothills. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 30-50%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.

Symbol	Name	Description
129	Bosanko-Balcom complex, 15 to 30 percent slopes	Bosanko-Balcom complex is about 45% Bosanko clay and about 40% Balcom clay loam. The Bosanko clay is on north-and east-facing side slopes and in swales. The Balcom clay loam is on hill ridgetops and on south-and west-facing side slopes. These soils formed in material weathered from calcareous shale, sandstone, or weakly consolidated sediments. Slopes range 15-30%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses, mustard, and other forbs. Precipitation is 12-20 inches and the mean annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
133	Botella clay loam, 9 to 15 percent slopes	Consists of well drained soils on alluvial fans. These soils formed in sedimentary alluvium. Slopes are 2-15%. Elevation ranges from 25-1,500 feet. The vegetation is mainly annual grasses and forbs and some oak trees and brush. Precipitation is 12-20 inches, and the average annual air temperature is about 62 degrees F. The frost free season is 260-350 days.
134	Calleguas clay loam, 50 to 75 percent slopes, eroded	Consists of well drained soils on uplands. These soils formed in material weathered from lime coasted shale or lime coated sandstone, or both. Slopes are 50-75%. Elevation ranges from 200-2,500 feet. The vegetation is annual grasses and forbs, mostly mustard and brush. Precipitation is 13-20 inches, and the average annual air temperature is about 61 degrees F. The frost free season is 300-350 days.
141	Cieneba sandy loam, 15 to 30 percent slopes	Consists of somewhat excessively drained soils. These soils formed in material weathered from granitic rocks of the Santa Ana Mountains and from the sandstone of the coastal foothills. Slopes are 9-75%. Elevation ranges from 200-4,000 feet. The vegetation is mostly brush. Precipitation is 14-25 inches, and the average annual air temperature is 59-62 degrees F. The frost free season is 200-340 days.
146	Corralitos loamy sand	Consists of somewhat excessively drained soils on fans in long, narrow valleys. These soils formed in mixed coarse textured alluvium. Slopes are 0-5%. Elevation ranges from 50-1,500 feet. The vegetation is mainly annual grasses and forbs and some trees and brush generally near stream channels. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 200-300 days.

Symbol	Name	Description
149	Cropley clay, 2 to 9 percent slopes, warm MAAT, MLRA 19	Consists of well drained soils on fans and valley fill. These soils formed in fine textured alluvium derived from sedimentary rocks. Slopes are 0-9%. Elevation ranges from 50-1,000 feet. The vegetation is annual grasses and forbs. Precipitation is 10-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 280-340 days.
179	Myford sandy loam, thick surface, 2 to 9 percent slopes	Consists of moderately well drained soils on marine terraces. These soils formed in sandy sediments. Slopes are 0-30%. Elevation ranges from 50-1,500 feet. The vegetation generally is annual grasses and forbs and scattered low growing brush. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 270-350 days.
198	Soboba cobbly loamy sand, 0 to 15 percent slopes	Consists of excessively drained soils on flood plains and alluvial fans. These soils formed in mixed alluvium. Slopes are 0-15%. Elevation ranges from 50-2,500 feet. The vegetation is annual grasses, forbs, cactus, brush, and some trees. Precipitation is 12-20 inches, and the mean annual air temperature is about 62 degrees F. The frost free season is 250-300 days.

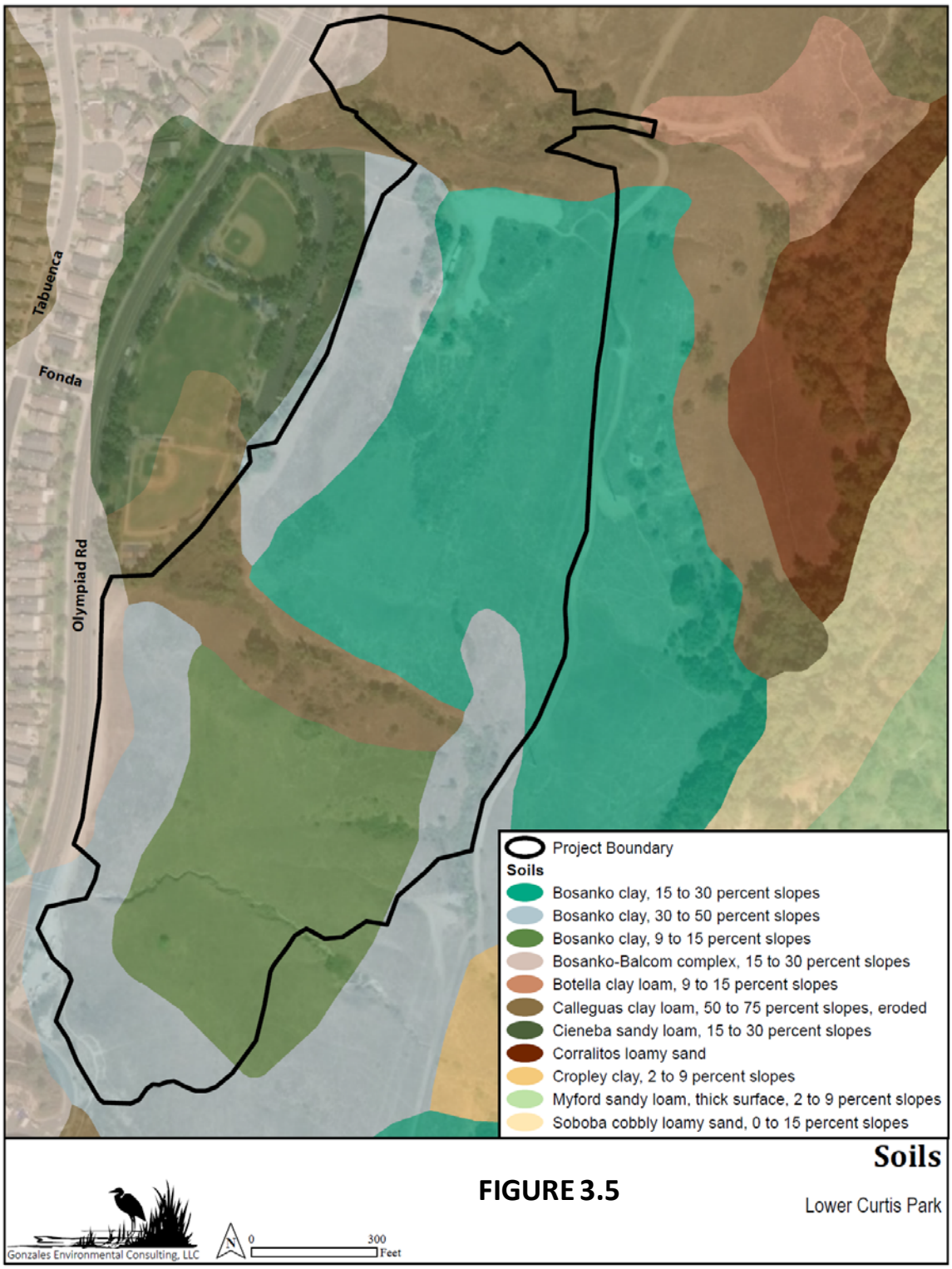


FIGURE 3.5

Soils

Lower Curtis Park

4. DELINEATION OF WATERS OF THE UNITED STATES

4.1 Regulatory Background

On May 27, 2015, the U.S. Environmental Protection Agency and Army Corps of Engineers issued their Clean Water Rule, defining the term "waters of the United States" (WOTUS) for purposes of Clean Water Act jurisdiction (Docket No. EPA-HQ-OW-2011-0880). The Agencies indicate that the rule defining WOTUS clarifies their jurisdiction to implement the Clean Water Act in the context of several US Supreme Court decisions. The final rule can be found in the June 29, 2015 issue of the Federal Register (Vol. 80, No. 24, pp. 37054-37127; http://www.regulations.gov/#%21documentDetail;D=EPA-HQ-OW-2011-0880-20862) and became effective on August 28, 2015. A stay was issued on the rule and it is not currently in effect.

The Rule creates three classifications of waters: (1) waters that are jurisdictional in all instances by rule (categorical WOTUS); (2) waters that are subject to case-specific analysis to determine jurisdiction; and, (3) waters that are excluded from jurisdiction by rule.

Six categories of waters are designated as jurisdictional by rule:

1. Traditional navigable waters ("All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide")
2. All interstate waters, including interstate wetlands
3. The territorial seas
4. All impoundments of waters otherwise identified as WOTUS
5. All tributaries, as defined in the final rule
6. All waters adjacent to one of the above water features, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters

The Rule acknowledges that the great majority of tributaries as defined by the Rule are headwater streams. Ditches also will be jurisdictional if they meet the definition of "tributary" and are not excluded.
"Adjacent" waters includes those "bordering, contiguous, or neighboring" categories 1 through 4 above, even if separated from those waters by "constructed dikes or barriers, natural river berms, beach dunes and the like."

"Neighboring" waters include those located in whole or part within the 100-year floodplain and that are within 1500 feet of the ordinary high water mark of traditional navigable water, interstate water, territorial sea, impoundment, or a tributary.

The preamble of the Rule states that "adjacent waters" do not include waters subject to established normal farming, silviculture, and ranching activities as those terms are used in Section 404(f) of the Clean Water Act.

"Other waters" determined on a case-specific basis to have a "significant nexus" to traditional navigable water, interstate water, or territorial sea also will be jurisdictional. The Rule identifies five specific types of other waters for which there is no need for a case-specific finding and,

therefore, they should be analyzed "in combination" (as a group, rather than individually) when determining if they are jurisdictional:

- Prairie potholes
- Carolina bays and Delmarva bays
- Pocosins
- Western vernal pools
- Texas coastal prairie wetlands

The Clean Water Rule also indicates that waters within the 100-year floodplain of traditional navigable water, interstate water, or the territorial seas, or within 4,000 feet of an ordinary high water mark may have a significant effect on downstream waters. These waters should be evaluated individually or in combination to determine if they are jurisdictional.

Several waters and features are excluded from jurisdiction in the Clean Water Rule, even if they otherwise qualify for jurisdiction under the tributary, adjacent, or other waters categories discussed above. Examples include prior converted cropland, waste treatment systems, and log ponds. The Rule states that it retains existing exclusions from the definition of WOTUS, and that "several exclusions reflecting longstanding agency practice are added to the regulation for the first time."

Definitions:

(4) Wetlands. The term wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(1) Adjacent. The term adjacent means bordering, contiguous, or neighboring a water identified in paragraphs (a)(1) through (5) of this section, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like. For purposes of adjacency, an open water such as a pond or lake includes any wetlands within or abutting its ordinary high water mark. Adjacency is not limited to waters located laterally to a water identified in paragraphs (a)(1) through (5) of this section. Adjacent waters also include all waters that connect segments of a water identified in paragraphs (a)(1) through (5) or are located at the head of a water identified in paragraphs (a)(1) through (5) of this section and are bordering, contiguous, or neighboring such waters. Waters being used for established normal farming, ranching, and silviculture activities (33 U.S.C. 1344(f)) are not adjacent. (The rule includes wetlands and other waters that meet the definition of adjacent, including "neighboring," which is defined separately. Only waters, not land, are adjacent. Within the definition of "adjacent," the terms bordering and contiguous are well understood, and the agencies will continue to interpret and implement those terms consistent with current policy and practice.)

(7) High tide line. The term high tide line means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means

that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(6) Ordinary high water mark. The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area. ("Ordinary high water mark" sets the boundary of adjacent non-wetland waters (e.g., open waters such as lakes and ponds). Physical indicators of ordinary high water mark can be created by perennial, intermittent, and ephemeral flows.)

(2) Neighboring. The term neighboring means: (i) All waters located within 100 feet of the ordinary high water mark of a water identified in paragraphs (a)(1) through (5) of this section. The entire water is neighboring if a portion is located within 100 feet of the ordinary high water mark; (ii) All waters located within the 100- year floodplain of a water identified in paragraphs (a)(1) through (5) of this section and not more than 1,500 feet from the ordinary high water mark of such water. The entire water is neighboring if a portion is located within 1,500 feet of the ordinary high water mark and within the 100-year floodplain; (iii) All waters located within 1,500 feet of the high tide line of a water identified in paragraphs (a)(1) or (a)(3) of this section, and all waters within 1,500 feet of the ordinary high water mark of the Great Lakes. The entire water is neighboring if a portion is located within 1,500 feet of the high tide line or within 1,500 feet of the ordinary high water mark of the Great Lakes. ("Neighboring" is the key determinant of whether a water is "adjacent," and thus jurisdictional by rule. Where the 100-year floodplain is greater than 1,500 feet, all wetlands within 1,500 feet of the tributary's ordinary high water mark are jurisdictional because they are "neighboring" to the tributary, regardless of the wetlands position relative to each other. Waters within the 100-year floodplain that are located more than 1,500 feet and up to 4,000 feet from the ordinary high water mark, or high tide line, are subject to case-specific significant nexus analysis under paragraph (a)(8).)

Riparian area omitted in the final rule because the agencies determined that the use of the riparian area was unnecessarily complicated and that as a general matter, waters within the riparian area will be within the 100-year floodplain.

(3) Tributary and tributaries. The terms tributary and tributaries each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (a)(4) of this section), to a water identified in paragraphs (a)(1) through (3) of this section that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark. These physical indicators demonstrate there is volume, frequency, and duration of flow sufficient to create a bed and banks and an ordinary high water mark, and thus to qualify as a tributary. A tributary can be a natural, man-altered, or man-made water and includes waters such as rivers, streams, canals, and ditches not excluded under paragraph (b) of this section. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if, for any length, there

are one or more constructed breaks (such as bridges, culverts, pipes, or dams), or one or more natural breaks (such as wetlands along the run of a stream, debris piles, boulder fields, or a stream that flows underground) so long as a bed and banks and an ordinary high water mark can be identified upstream of the break. A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if it contributes flow through a water of the United States that does not meet the definition of tributary or through a nonjurisdictional water to a water identified in paragraphs (a)(1) through (3) of this section. (This term has not previously been defined in any regulation or preamble. Bed and banks and ordinary high water mark (OHWM) are features that generally are physical indicators of flow. OHWM generally defines the lateral limits of a water. In many tributaries, the bed is that part of the channel below the OHWM, and the banks often extend above the OHWM. Man-altered and man-made tributaries perform many of the same functions as natural tributaries and provide connectivity between streams and downstream rivers.)

(8) Significant nexus. The term significant nexus means that a water, including wetlands, either alone or in combination with other similarly situated waters in the region, significantly affects the chemical, physical, or biological integrity of a water identified in paragraphs (a)(1) through (3) of this section. The term "in the region" means the watershed that drains to the nearest water identified in paragraphs (a)(1) through (3) of this section. For an effect to be significant, it must be more than speculative or insubstantial. Waters are similarly situated when they function alike and are sufficiently close to function together in affecting downstream waters. For purposes of determining whether or not a water has a significant nexus, the water's effect on downstream (a)(1) through (3) waters shall be assessed by evaluating the aquatic functions identified in paragraphs (A) through (I) of this paragraph. A water has a significant nexus when any single function or combination of functions performed by the water, alone or together with similarly situated waters in the region, contributes significantly to the chemical, physical, or biological integrity of the nearest water identified in paragraphs (a)(1) through (3) of this section. Functions relevant to the significant nexus evaluation are the following: (i) Sediment trapping, (ii) Nutrient recycling, (iii) Pollutant trapping, transformation, filtering, and transport, (iv) Retention and attenuation of flood waters, (v) Runoff storage, (vi) Contribution of flow, (vii) Export of organic matter, (viii) Export of food resources, and (ix) Provision of life cycle-dependent aquatic habitat (such as foraging, feeding, nesting, breeding, spawning, or use as a nursery area) for species located in a water identified in paragraphs (a)(1) through (3) of this section. (In the final rule, the agencies list specific functions relevant to significant nexus evaluation to add clarity and transparency. A water does not need to perform all functions. If a water performs a single function that has significant impact on a downstream water, that is a significant nexus. Under the final rule, only waters covered by subparagraph (a)(7) or (a)(8) require case-specific analysis.)

Notes: The proposed rule that was announced on March 25, 2014, was published in the Federal Register on April 21, 2014 (79 Federal Register 22188-22274). The final revised rule was announced jointly by EPA and the Army Corps on May 27, 2015, and was published in the Federal Register on June 29: Department of the Army, Corps of Engineers, and Environmental Protection Agency, "Clean Water Rule: Definition of 'Waters of the United States,' Final Rule," 80 Federal Register 37054-37127, June 29, 2015. a. 33 C.F.R. 328.3, 40 C.F.R. 122.2, 40 C.F.R. 230.3, and 40 C.F.R. 232.2 (definition of "waters of the United States"). The term "navigable waters" is defined

at 40 C.F.R. 110.1 (Discharge of Oil); 40 C.F.R. 112.2 (Oil Pollution Prevention); 40 C.F.R. 116.3 (Designation of Hazardous Substance); 40 C.F.R. 117.1(i) (Determination of Reportable Quantities for Hazardous Substances); 40 C.F.R. 300.5 and Appendix E 1.5 to Part 300 (National Oil and Hazardous Substances Pollution Contingency Plan); and 40 C.F.R. 302.3 (Designation, Reportable Quantities, and Notification). b. Comments in this table are drawn from the preamble and text of the final rule. c. The term "prior converted cropland" is included in the U.S. Department of Agriculture's administrative definition of the term "wetland" (see 7 C.F.R. 12.2). d. A definition of "waste treatment system" is found in EPA regulations (35 C.F.R. 35.905): "Complete waste treatment system. A complete waste treatment system consists of all of the treatment works necessary to meet the requirements of title III of the Act, involved in (a) The transport of waste waters from individual homes or buildings to a plant or facility where treatment of the waste water is accomplished; (b) the treatment of the waste waters to remove pollutants; and (c) the ultimate disposal, including recycling or reuse, of the treated waste waters and residues which result from the treatment process. One complete waste treatment system would, normally, include one treatment plant or facility, but also includes two or more connected or integrated treatment plants or facilities." e. Probably should be "(i) through (ix) of this paragraph."

4.2 Methods

The starting point for this study was a field trip to the project site in 2019. For this study the "Routine Onsite Determination Method" data forms were used, onto which recorded information or otherwise compiled notes regarding the descriptive physical and biological attributes from the area. From a combination of field experience, references, assistance from others, and reconnaissance trips information resources were compiled from which the jurisdictional determinations have been made. Photographs were taken on each visit, some of which are included in this document. Field notes and photographs were arranged by date.

The routine approach (potential problem area) was utilized on this project, with on-site determination based on the three parameters of dominant plant species, soil characteristics, and hydrologic characteristics of the area.

Data sources used:
a. USGS quadrangle maps
b. Soil Surveys
c. Aerial photos
d. State list of hydric soils
e. National Wetland Plant List 2017
f. Munsell Soil Charts

The following steps were performed:

1. Project area was identified and mapped on USGS quadrangle map.

2. Vegetation for the project area was summarized and identified utilizing transects and observation points.

3. Area soils were characterized and identified.

4. Hydrology data was gathered utilizing field hydrologic indicators and available

data.

In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within these three parameters. Non-wetland waters of the U.S. are delineated based on the limits of the OHWM as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. RWQCB shares USACE jurisdiction, unless isolated conditions are present. In the presence of isolated conditions, RWQCB takes jurisdiction from the OHWM and/or the 3—parameter wetland methodology utilized by the USACE. CDFW takes jurisdiction defined to the top of the bank of the stream/channel or to the extreme limits of the adjacent riparian vegetation (drip line).

GEC wetland/streambed biologists Teresa Gonzales and Paul Gonzales visited the site during September, October and November 2019 to conduct a delineation of potentially jurisdictional waters utilizing the methodology described below.

4.2.1 Federal Delineation Methods-Non-Wetland Waters of the U.S.

Potential jurisdictional features were evaluated prior to conducting the field assessment by using a series of current aerial photographs, detailed topographic maps, the available soils information, and the local and state hydric soil list (NRCS 2011a, 2011b). Additionally, prior to conducting the field assessment, transects (ranging from 0.15 to 0.5 miles in length) were drawn on a one-meter resolution aerial photograph. During the field assessment, points where these transects intercepted potentially jurisdictional waters were mapped on the aerial photographs or with a Garmin GPS unit. Field maps were digitized using Geographic Information System (GIS) technology and the total area of jurisdictional features was calculated.

Jurisdictional non-wetland "waters of the U.S." were delineated based on the limits of the ordinary high water mark (OHWM) as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetation characteristics. Criteria used to aid in the determination of the limit and/or presence of the/an OHWM are presented below in Tables 4-1 and 4-2.

TABLE 4-1

POTENTIAL GEOMORPHIC INDICATORS OF ORDINARY HIGH WATER MARKS FOR THE ARID WEST

Potential Geomorphic OHWM Indicators		
(A) Below OHWM	**(B) At OHWM**	**(C) Above OHWM**
1. In-stream dunes	1. Valley flat	1. Desert pavement
2. Crested ripples	2. Active floodplain	2. Rock varnish
3. Flaser bedding	3. Benches: low, mid, most prominent	3. Clast weathering
4. Harrow marks	4. Highest surface of channel bars	4. Salt splitting
5. Gravel sheets to rippled sands	5. Top of point bars	5. Carbonate etching
6. Meander bars	6. Break in bank slope	6. Depositional topography
7. Sand tongues	7. Upper limit of sand-sized particles	7. Caliche rubble
8. Muddy point bars	8. Change in particle size distribution	8. Soil development
9. Long gravel bars	9. Staining of rocks	9. Surface color/tone
10. Cobble bars behind obstructions	10. Exposed root hairs below intact soil layer	10. Drainage development
11. Scour holes downstream of obstructions	11. Silt deposits	11. Surface relief
12. Obstacle marks	12. Litter (organic debris, small twigs and leaves)	12. Surface rounding
13. Stepped-bed morphology in gravel	13. Drift (organic debris, larger than twigs)	
14. Narrow berms and levees		
15. Streaming lineations		
16. Dessication/mud cracks		
17. Armored mud balls		
18. Knick Points		

TABLE 4-2
POTENTIAL VEGETATION INDICATORS OF ORDINARY HIGH WATER MARKS FOR THE ARID WEST

Potential Vegetation OHWM Indicators			
	(D) Below OHWM	**(E) At OHWM**	**(F) Above OHWM**
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation Annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric Ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

4.2.2 Federal Delineation Methods- Wetlands

This jurisdictional wetland delineation used a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. Data on vegetation, hydrology, and soils were collected using the methods described below and, recorded on Wetland Determination Data Forms.

4.2.2.1 Vegetation

Plant species in each stratum (tree, sapling/shrub, herb, and woody vine) were ranked according to their canopy dominance (USACE 2008). Beginning with the species with the highest coverage, species that contributed to a cumulative coverage total of at least 50 percent and any species that comprised at least 20 percent of the total coverage for each stratum were recorded on the Field Data Sheets (50/20 Rule). The wetland indicator status was assigned to each dominant species using the *National Wetland Plant List* (National Wetlands Inventory, 2012). If greater than 50 percent of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for

wetland vegetation was considered to be met. The following indicator plant status categories were used:

- Obligate Wetland (OBL): Plants that occur almost always (estimated >99%) in wetlands under natural conditions, but which may also occur rarely (estimated <1% in non- wetlands (i.e., cat—tails or pickleweed).

- Facultative Wetland (FACW): Plants that occur usually (estimated 67-99%) in wetlands, but also occur (estimated 1-33%) in none—wetlands (i.e., mulefat or willow).

- Facultative (FAC): Plants with similar likelihood (estimated 33-67%) of occurring in both wetlands and none—wetlands.

- Facultative Upland (FACU): Plants that occur sometimes (estimated 1-32%) in wetlands, but occur more often (estimated 67-99%) in non-wetlands.

- Obligate Upland (UPL): Plants that occur rarely (estimated <1%) in wetlands, but occur almost always (estimated >99%) in none—wetlands under natural conditions.

4.2.2.2 Hydrology

The potential presence of wetland hydrology was evaluated by recording the extent of observed primary and secondary indicators (USACE, 2008). Indicators such as, but not limited to, surface water or saturated soils (both Group A indicators) were recorded if observed. The Arid West Supplement includes two additional indicator groups that can be used during dry conditions or in areas where surface water/saturated soils are not present including Group B (evidence of recent inundation) and Group C (evidence of recent soil saturation) (USACE, 2008). The indicators are divided into two categories (primary and secondary indicators) and the presence of one primary indicator from any of the groups is considered evidence of wetland hydrology. These indicators are intended to be one-time observations of site conditions representing evidence of wetland hydrology when hydrophytic vegetation and hydric soils are present (USACE, 2008).

TABLE 4-3
WETLAND HYDROLOGY INDICATORS *

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	

* Based on 1987 USACE Manual and Related Guidance Documents

TABLE 4-4
WETLAND HYDROLOGY INDICATORS FOR THE ARID WEST*

	Primary Indicator (*any one indicator is sufficient to make a determination that wetland hydrology is present*)	**Secondary Indicator** (*two or more indicators are required to make a determination that wetland hydrology is present*)
Group A – Observation of Surface Water or Saturated Soils		
A2 - High Water Table		
Group B – Evidence of Recent Inundation		
81 -Water Marks		**X** (Riverine)
82 -Sediment Deposits		**X** (Riverine)
83 -Drift Deposits		**X** (Riverine)
86 - Surface Soil Cracks	**X**	
87 - Inundation Visible on AerialImagery	**X**	
89 -Water-Stained Leaves	**X**	
810 - Drainage	**X**	**X**
811 - Salt Crust		
812 - 8iotic Crust		
Group C – Evidence of Current or Recent Soil Saturation		
C2 - Dry-Season Water Table		
C9 - Saturation Visible on AerialImagery		**X**
Group D – Evidence from other Site Conditions or Data		
D3 - Shallow Aquitard		
D5 - FAC-Neutral Test		**X**

4.2.2.3 Soils

Soils are Alo-Bosanko association. Alo-Bosanko association soils are strongly sloping to steep, well drained clays on coastal foothills. Data from observations of on-site soil characteristics were used as the basis for evaluating whether hydric/wetland soils are present on the site.

TABLE 4-5
FIELD INDICATORS OF HYDRIC SOIL CONDITIONS*

a. Terrace Escarpments
b. Histic Epipedon
c. Stripped Matrix
d. Loamy Mucky Mineral

* Based on 1987 USACE Manual and Related Guidance Documents

Conditions Assessed from the Literature

Prior to onsite fieldwork, USGS topographic maps [San Juan Capistrano, California 7.5' USGS topographic Quadrangle], National Resource Conservation Service Hydric Soils List for California (2018), local precipitation data, hydrological information and relevant literature (complete listing is found under References for this report) were reviewed.

USGS 7.5' Topographic Quadrangle - San Juan Capistrano, California: Elevation of the assessment area ranges from a from a low of 652± feet above mean sea level (msl) in the eastern portion of the assessment area to a high of 797± feet above msl in the western portion of the assessment area. This represents an elevational change across the assessment area of 145± feet. The entire site consists of undulating, sloping land. The project site has been impacted by anthropogenic activities. Land use in the surrounding area varies between natural, park and single family residential. The project will impact public/quasi-public (PQP) land and is on PQP lands.

Recent Aerial Photography: Aerial photography is from Google 2019.

Soil Survey: Natural Resources Conservation Service

Hydric Soils List of California: Natural Resources Conservation Service

All of the mapped features w ere further analyzed using Geographic Information Systems (GIS) software and high resolution aerial imagery. The total acreage of all potentially jurisdictional features occurring in the surrounding buffer was calculated using GIS software.

4.3 Results

GEC found federal waters of the U.S. Refer to Table 4-6 and Figure 4-1 for the locations and acreages of jurisdictional features.

Delineation studies found waters of the U.S. (WOUS) on the project site. 0.301 acre of WOUS is found on the project site.

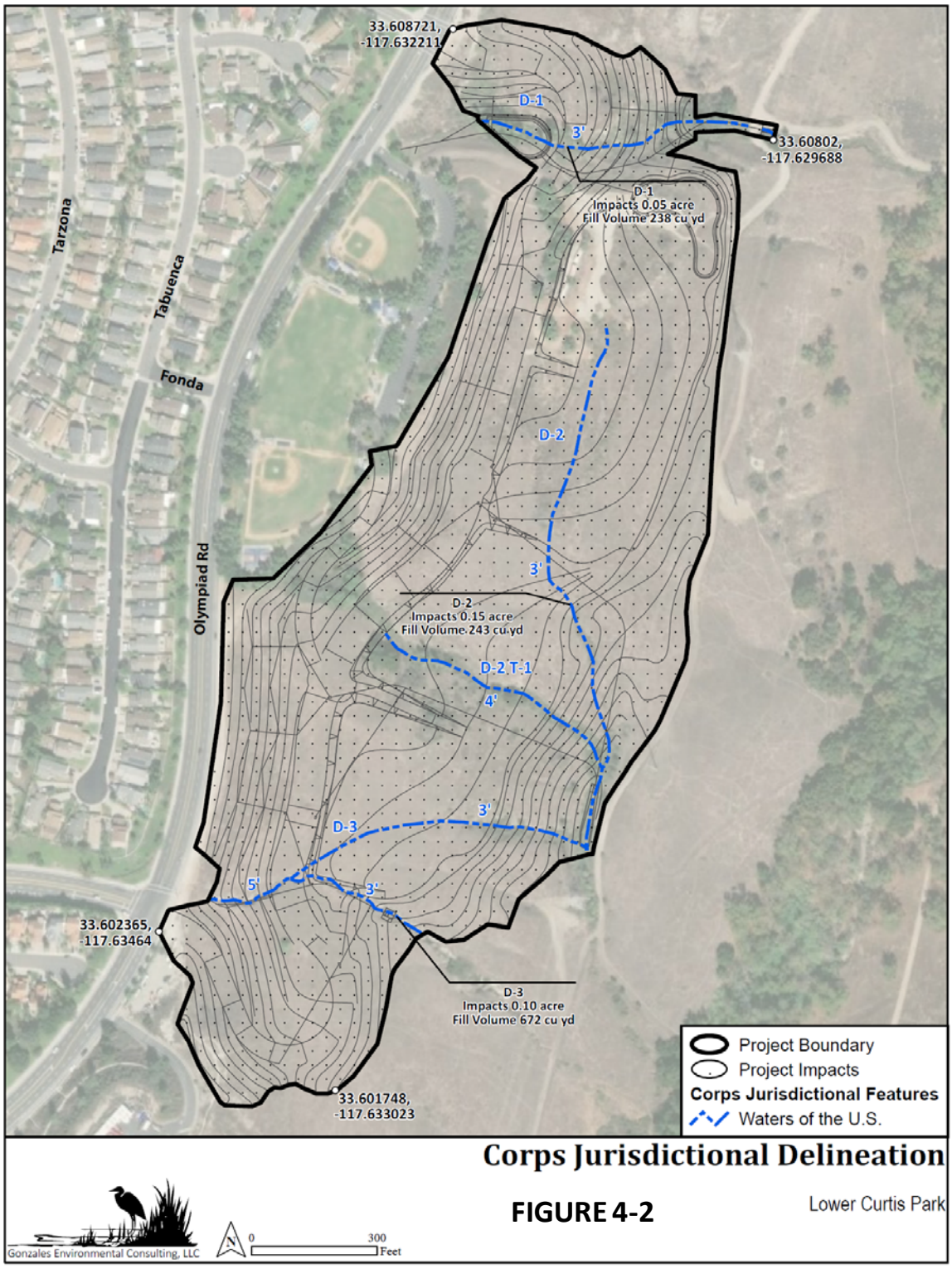
TABLE 4-6
SUMMARY OF POTENTIAL USACE JURISDICTION BY HABITAT AND DRAINAGE

USACE Jurisdictional Delineation	Existing On-site	Linear Feet	Impacts	Impacts Linear feet
	0.301	**4017**	**0.301**	**4017**
WOUS	**acre**	**feet**	**acre**	**feet**


33.608721,
-117.632211
D-1
3'
33.60802,
-117.629688
Tarzona
Tabuenca
Fonda
Olympiad Rd
D-2
3'
D-2 T-1
4'
3'
D-3
5'
3'
33.602365,
-117.63464
33.601748,
-117.633023
Project Boundary
Corps Jurisdictional Features
Waters of the U.S.
Corps Jurisdictional Delineation
FIGURE 4-1
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

4.3.1 Summary of Potentially Federal Jurisdictional Impacts

Impacts were calculated and is shown in Table 4-6 and Figure 4-2.



5. DELINEATION OF CDFW JURISDICTIONAL HABITATS

5.1 Regulatory Background

Fish and Game Code Chapter 6, Fish and Wildlife Protection and Conservation, Section 1600 *et seq.* was enacted to provide for the conservation of fish and wildlife resources associated with stream ecosystems. The FGC further defines fish and wildlife to include: all wild animals, birds, plants, fish, amphibians, invertebrates, reptiles, and related ecological communities, including the habitat upon which they depend for continued viability (FGC Division 5, Chapter 1, section 45, and Division 2, Chapter 1, section 71 l.2(a), respectively). Fish means wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn or ova thereof (FGC, Division 5, Chapter 1, section 45).

For the purposes of implementing sections 1601 and 1603 of the FGC, California Code of Regulations Title 14, section 720 requires submission to the Department of general plans sufficient to indicate the nature of a project for construction by or on behalf of any person, government agency, state or local, and any public utility, of any project which will divert, obstruct or change the natural flow or bed of any river, stream or lake designated by the Department, or will use material from the streambeds designated by the Department, all rivers, streams, lakes, and streambeds in the State of California, including all rivers, streams and streambeds which may have intermittent flows of water, are hereby designated for such purpose.

Division 2, Chapter 5, Article 6, Section 1600 *et seq.* of the California Fish and Game Code does not limit jurisdiction to areas defined by specific flow events or seasonal changes in water flow. Accordingly, it has been the practice of the Department to define the stream channel as that area where water uniformly or habitually flows over a given course, and where the width of the watercourse can reasonably be defined. Thus, a channel is not defined by a specific flow event, nor by the path of surface water as this path might vary seasonally. Rather, it is the Departments practice to define the channel based on the topography or elevations of land that confine the water to a definite course when the waters of a creek rise to their highest point. To define jurisdictional boundaries otherwise would result in a morass of jurisdictional boundaries that differed from stream to stream, changed with variations in channel morphology along the same stream, or that shifted seasonally on any given stream along with seasonal changes in flow.

The Department's website has additional information regarding dryland streams in "A review of Stream Processes and Forms in Dryland Watersheds" at this location:http://www.dfg. ca.gov/habcon/1600/ 1600resources.html.

CDFG's definition of "lake" includes "natural lakes or man-made reservoirs."

Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake which supports fish or wildlife, require authorization

from CDFG by means of entering into an agreement pursuant to Section 1601 or 1603 of the Fish and Game Code.

5.2 CDFG Jurisdictional Waters

State-jurisdictional streambeds were delineated in the field concurrently with the delineation of non-wetland federal waters (Section 4.2.1, above). Prior to conducting field assessments, transects (ranging from 0.15 to 0.5 miles in length) were drawn on a one-meter resolution aerial photograph. During the field assessment, points where these transects intercepted potentially jurisdictional waters were mapped on the aerial photographs or with a Trimble GeoXT GPS unit. Field maps were digitized using GIS technology and the total area of jurisdictional features was calculated.

CDFW jurisdictional areas were calculated based on mapping episodic stream activity boundaries (MESA) or dripline of riparian vegetation, whichever was greater.

5.3 Results

GEC found CDFW jurisdictional streambed on the project site. Refer to Table 5-1 and Figure 5-1 for the locations and acreages of jurisdictional features.

Delineation studies found 1.018 acres of streambed and 5.124 acres of riparian on the project site.

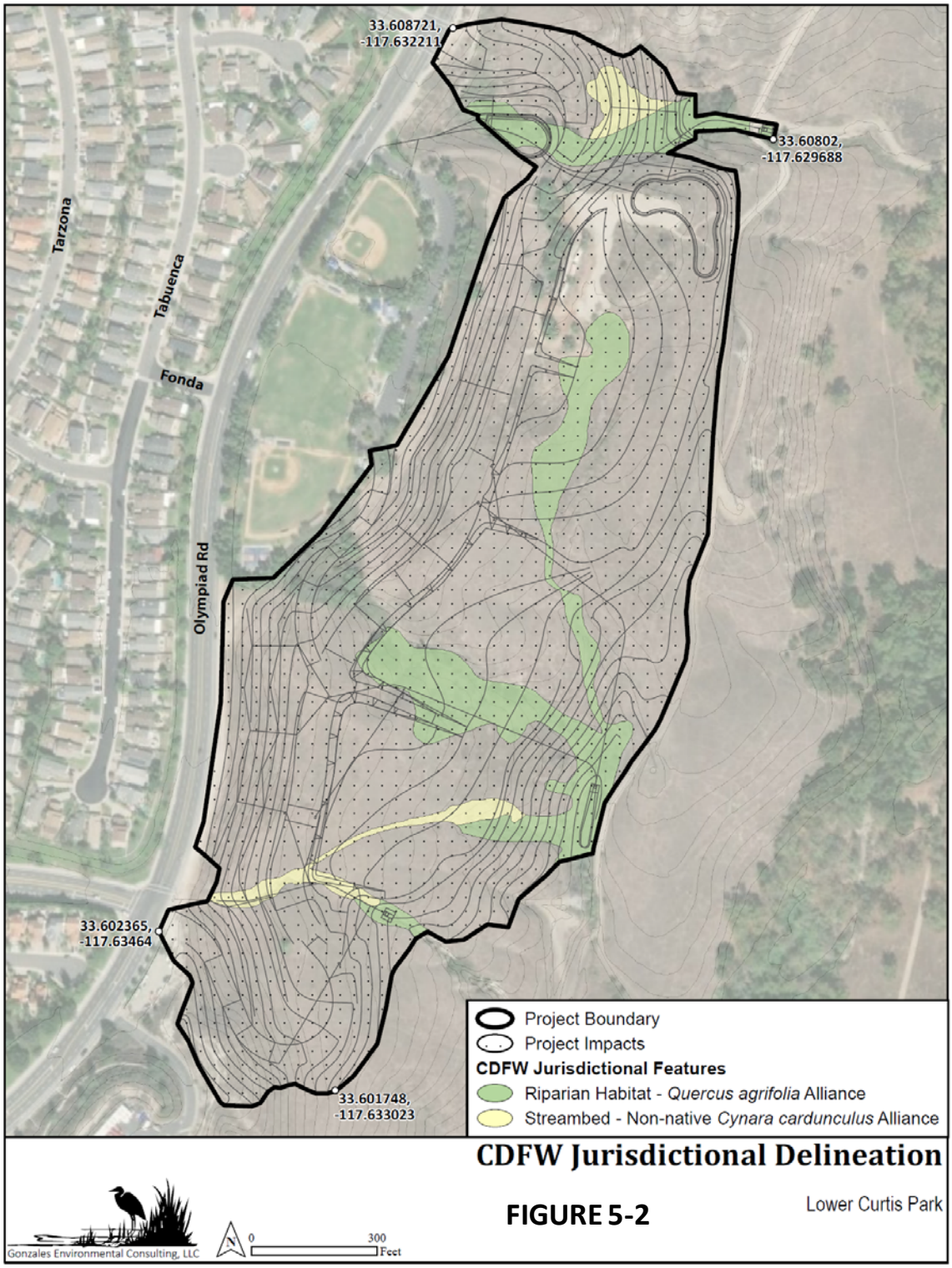
TABLE 5-1
SUMMARY OF POTENTIAL CDFW JURISDICTION BY HABITAT

	Existing			
CDFW Jurisdictional Delineation	**Existing On-site**	**Existing On-site (length in feet)**	**Impacts On-site**	**Length in feet**
Streambed	1.018	906	1.018	906
Riparian Habitat	5.124	3111	5.124	3111
TOTAL	**6.142**	**4017**	**6.142**	**4017**


33.608721,
-117.632211
33.60802,
-117.629688
Tarzona
Tabuenca
Fonda
Olympiad Rd
33.602365,
-117.63464
33.601748,
-117.633023
Project Boundary
CDFW Jurisdictional Features
Riparian Habitat - Quercus agrifolia Alliance
Streambed - Non-native Cynara cardunculus Alliance
CDFW Jurisdictional Delineation
FIGURE 5-1
Lower Curtis Park
Gonzales Environmental Consulting, LLC
0
300
Feet

5.3.1 Summary of Potentially CDFW Jurisdictional Impacts

Impacts were calculated and are shown in Table 5-1 and Figure 5-2.



6. PERMITS/AGREEMENTS

Permits/agreements needed

The area is under the jurisdiction of the California Department of Fish and Wildlife, U.S. Army Corps of Engineers and California Regional Water Quality Control Board. Permits/Agreements for activities within the streambed will be required by the California Department of Fish and Wildlife, U. S. Army Corps of Engineers and California Regional Water Quality Control Board. Final authority over the area rests with the appropriate agencies. U.S. Army Corps of Engineers has requested that the following statement be added to all delineations:

"This delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work."

Mitigation Recommendations

This section describes the mitigation measures (MMs) required for impacts to special-status vegetation communities, including jurisdictional areas. These MMs will reduce identified and potential significant impacts to a level which is less than significant pursuant to CEQA, and to comply with conditions of the Orange County Southern Subregion Habitat Conservation Plan (HCP) Biological Opinion.

Impact BIO-1: (Impacts to special-status vegetation communities.) There will be direct impacts to 5.214 acres of *Quercus agrifolia* alliance, a special-status vegetation communities as a result of the proposed project.
MM BIO-1.1: Mitigation for temporary impacts to this community will be through on- site or off-site restoration at a 1:1 ratio to restore impacted special-status vegetation communities to pre-construction conditions. A revegetation plan will be developed, and all revegetation efforts will be consistent with the management plan developed for the HCP for this particular subarea. The revegetation plan shall include a monitoring program, clearly defined success criteria, and contingency measures.

Impact BIO-2: (Impacts to special-status vegetation communities outside of the impact area.)

MM BIO-2.1: To prevent inadvertent disturbance to special-status vegetation communities outside the limits of work, vegetation removal shall be monitored by a biologist and standard best management practices (BMPs) will be implemented. A biologist shall be contracted to perform biological monitoring during all clearing activities.

The following duties shall be carried out by the biological monitor:

1. Review and/or designate the vegetation removal area in the field with the contractor in accordance with the final plan.
2. Be present during initial vegetation clearing, grubbing, and grading
3. Record any advertent impacts to vegetation communities outside the designated construction zone in daily monitoring reports.

Special-Status Wildlife

This section describes the mitigation measures (MMs) required for impacts to special-status wildlife. These MMs will reduce identified and potential significant impacts to a level which is less than significant pursuant to CEQA, and to comply with conditions of the Orange County Southern Subregion Habitat Conservation Plan (HCP) Biological Opinion.

Impact BIO-3: Project construction could result in both direct and indirect impacts to nesting special-status birds (including migratory species), causing injury, or mortality and other adverse effects such as increased stress and nest abandonment. For special-status bird species known or with potential to nest in the study area, direct impacts could include the loss of nests, eggs, and fledglings if vegetation clearing and ground-disturbing activities occur during the nesting season (generally between February 1 and September 30). Indirect impacts such as noise could disrupt breeding activity and potentially result in effects such as nest abandonment, reduced foraging, and increased stress, potentially resulting in reduced reproductive success.

MM BIO-3.1: To prevent inadvertent direct and indirect impacts to special-status birds, the following avoidance measures will be implemented:
1. Pre-construction nest surveys will be conducted within 1 week prior to vegetation clearing if construction occurs during the nesting season of species known or with potential to nest in the study area. Locations of nesting birds will be mapped and appropriate no-work buffers will be established including 500-foot buffers for listed species such as California gnatcatcher, 500 feet for special-status raptors, and 50-foot buffers for non-listed passerine species.
2. Discuss procedures for minimizing harm to or harassment of wildlife encountered during construction with the contractor and other key construction personnel prior to clearing, grubbing, or grading.
3. Flush special-status species (i.e., avian or other mobile species) from occupied habitat areas during the non-breeding season immediately prior to brush-clearing and earth-moving activities.

Jurisdictional Waters/Streambed

This section describes the mitigation measure (MM) required to reduce impacts to jurisdictional waters/streambed to a level which is less than significant pursuant to CEQA, and to comply with conditions of the HCP Biological Opinion. Additional or more specific mitigation requirements may be required to obtain the required Clean Water Act (CWA) Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB), to obtain a Section

404 Permit from U.S. Army Corps of Engineers (ACOE)*[3], and to obtain a California Fish and Game Code Section 1602 Streambed Alteration Agreement (SAA) from CDFW.

Impact BIO-4: (Impacts to jurisdictional streambed and waters.) Impacts to jurisdictional streambed and waters habitats will be mitigated as described under MM BIO-1.1 above. In addition, the following MM is required.

MM BIO-4.1: To comply with the state and federal regulations for impacts to "waters of the United States and state," the following agency permits are required, or verification that they are not required shall be obtained.
The following permit and agreement shall be obtained:

- A CWA, Section 401/404 permit issued by the California RWQCB and the ACOE for all project-related disturbances of waters of the United States and/or associated wetlands.
- A Section 1600 SAA issued by the CDFW for all project-related disturbances of any streambed.

Impact BIO-5: (Impacts to jurisdictional waters outside of impact area.) This impact will be mitigated through MM BIO- 2.1 described above.

MM BIO-5.1: This impact will be mitigated through MM BIO- 2.1 described above.

[3] Project is in a Special Area Management Plan for ACOE. There are no nationwide permits authorized for the area.

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APPENDIX A

Regional, USGS, Vegetation Mapping



Source: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Regional Map

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 4 Miles



Site Plan

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet



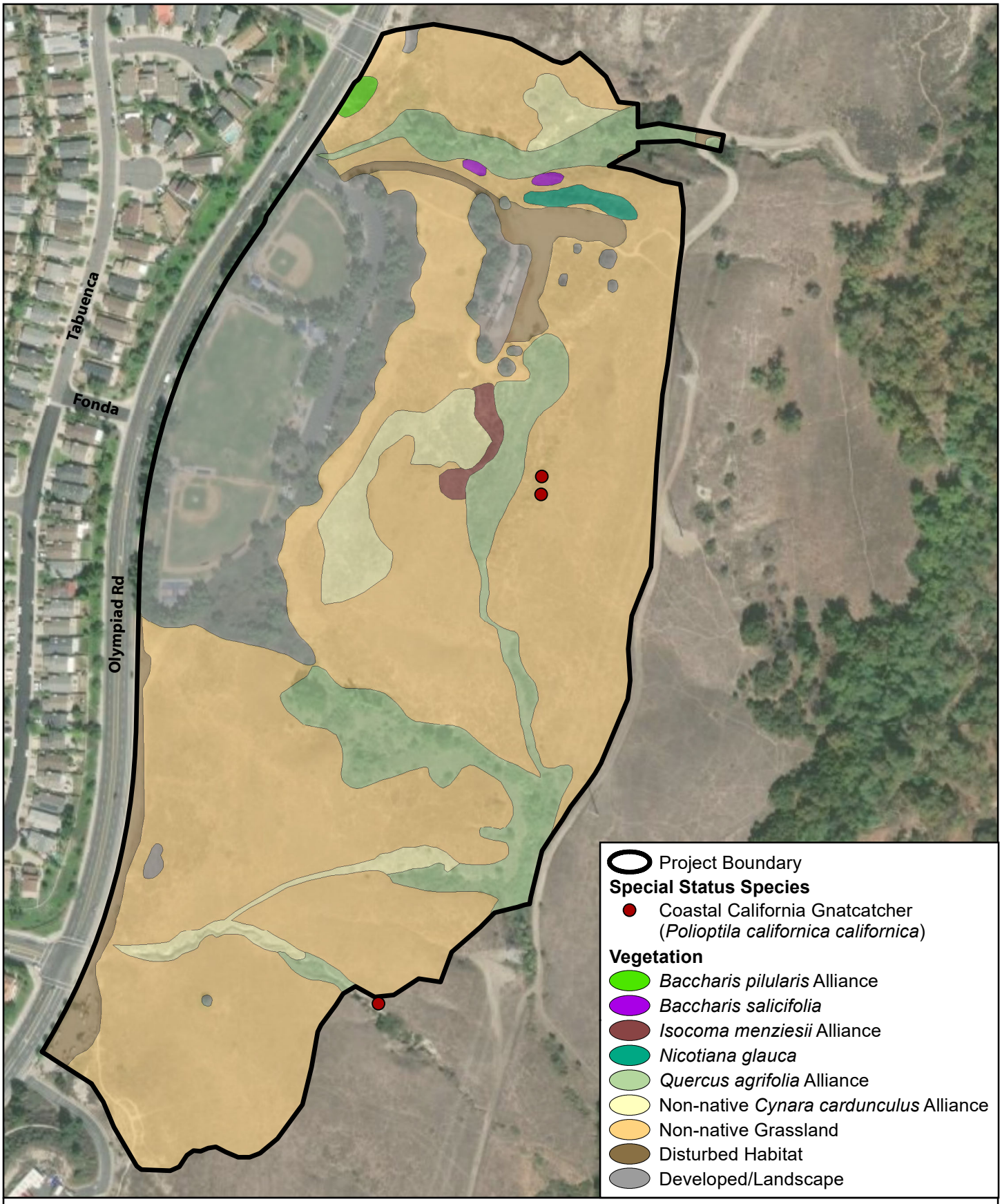
Source: USGS 7.5' Quadrangles (San Juan Capistrano & Canada Gobernadora);
Copyright:© 2013 National Geographic Society, i-cubed

USGS Topo

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 2,000 Feet



Biological Resources

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet

APPENDIX B

USACE & CDFW MAPPING

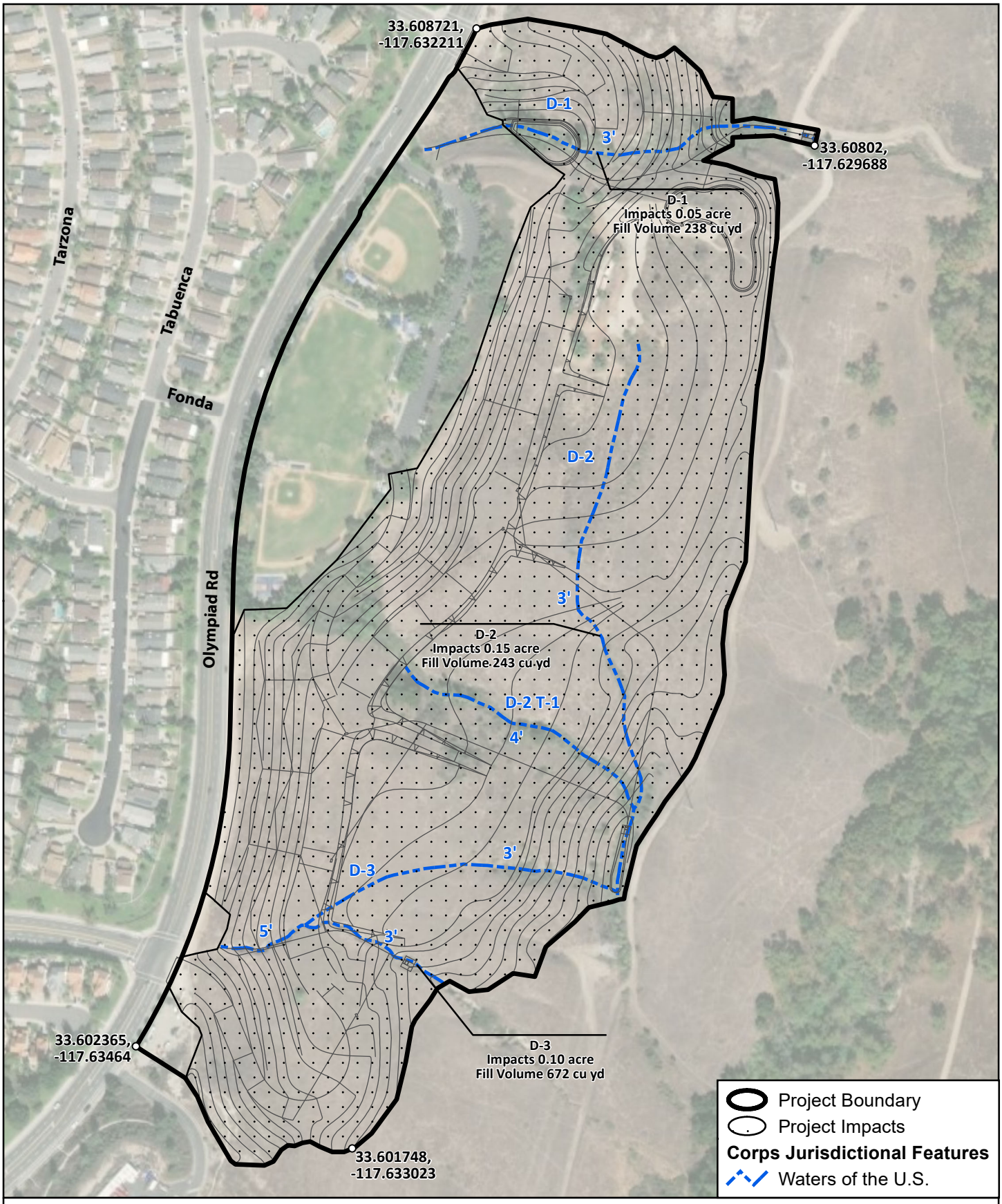


Corps Jurisdictional Delineation

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet



Corps Jurisdictional Delineation

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet

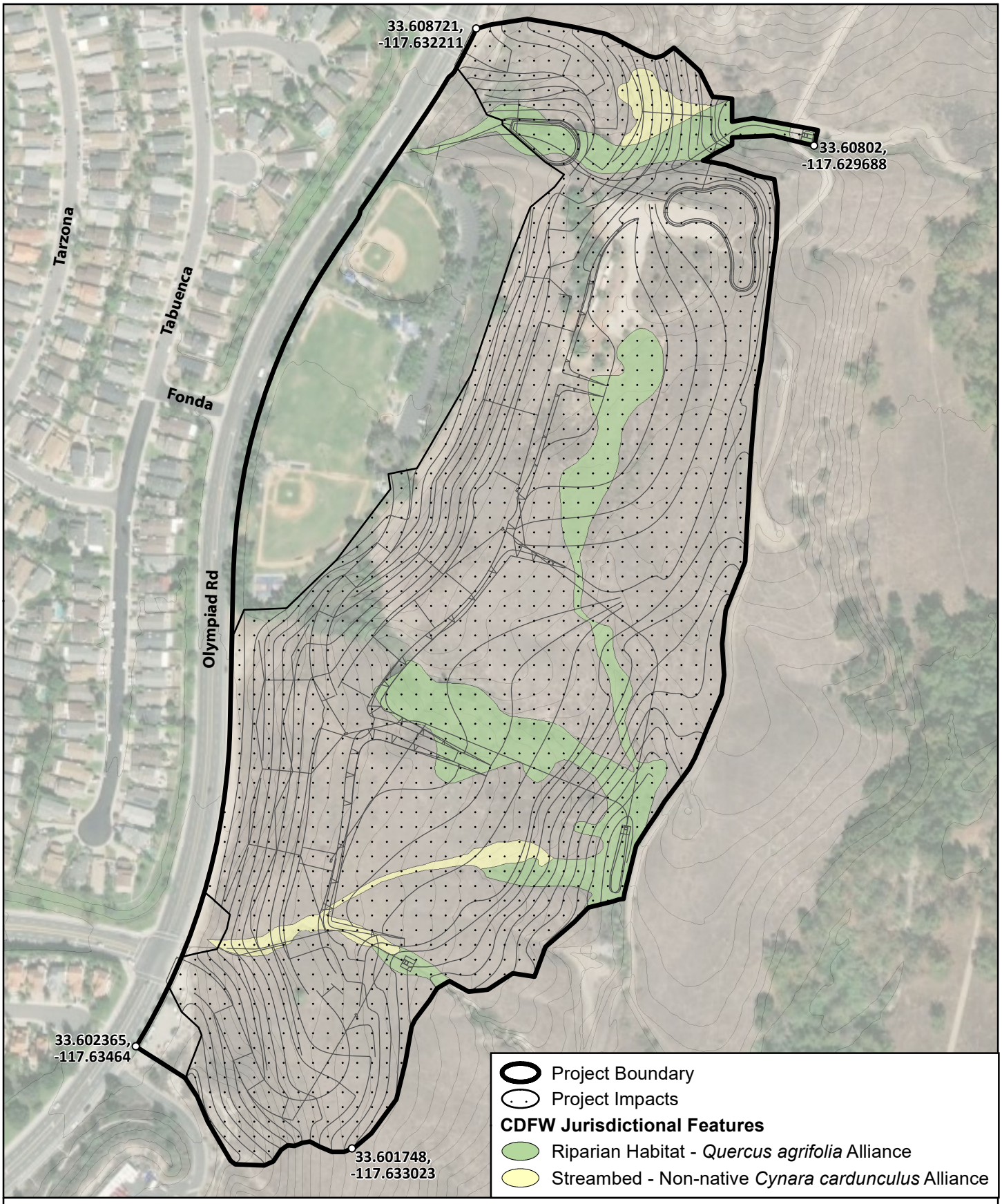


CDFW Jurisdictional Delineation

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet



CDFW Jurisdictional Delineation

CURTIS PARK

Gonzales Environmental Consulting, LLC

N 0 300 Feet

APPENDIX C

DATA SHEETS

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 1-1
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species	Dominance Test worksheet:
1. *Washingtonia robusta*	30	√	NI	Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
2. *Quercus agrifolia*	20		NI	Number of Dominant Species Across All Strata: 0 (B)
3.				Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)
4.				
Total Cover: 50%				

Sampling/Shrub Stratum				Prevalence Index worksheet:	
1. *Cortaderia jubata*	10		FACU	Total % Cover of:	Multiply by:
2. *Baccharis pilularis*	30		NI	OBL species 0	X1=
3.				FACW species 0	X2=
4.				FAC species 10	X3=30
5.				FACU species 10	X4=40
6.				UPL species 0	X5=0
7.				Column Totals: 20 (A)	70 (B)
8.				Prevalence Index=B/A=	3.5
Total Cover: 40 %					

Herb Stratum				Hydrophytic Vegetation Indicators:
1. *Urtica dioica*	10		FAC	Dominance Test is >50%
2.				Prevalence Index is <3.0[1]
3.				Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
4.				Problematic Hydrophytic Vegetation[1] (Explain)
Total Cover: 10%				[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum				Hydrophytic Vegetation Present:	
				Yes	No√
Total Cover:					

%Bare Ground in Herb Stratum: %	% Cover of Biotic Crust	Hydrophytic Vegetation Present:	
		Yes	No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-1-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 6/3						Shaly clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 1

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 1
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 1with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 1 receives surface flow from storm events from overside drain off of Olympiad Road.

Brief site description: Unnamed Drainage 1 begins at overside drain off of Olympiad Road north of the existing and traverses the project site from the west to east before flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 1 on the project site.

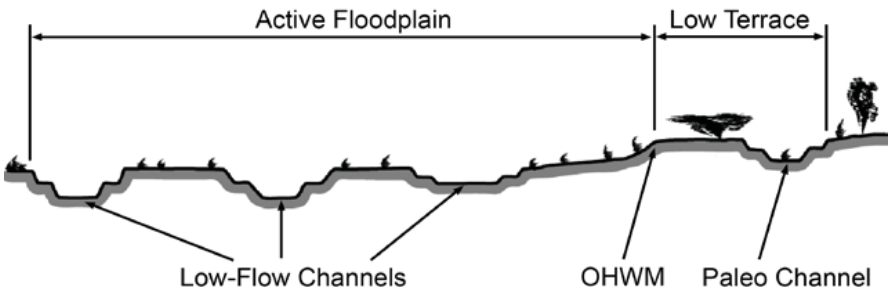
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

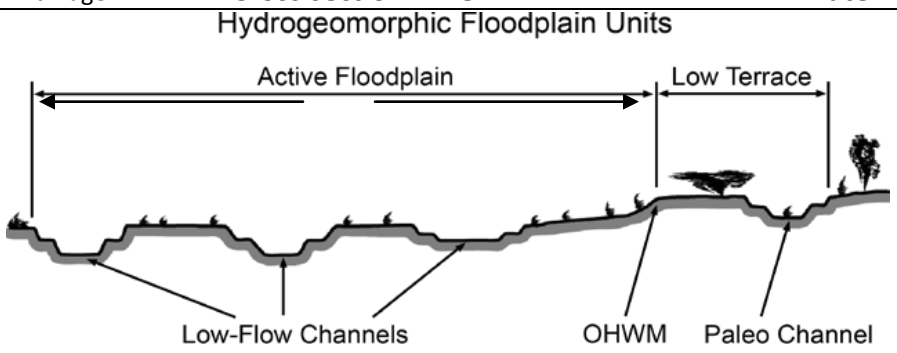


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 1-1 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 50%Shrub: 40 % Herb: 10%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
□Mid (herbaceous, shrubs, saplings)
xLate (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 1-2
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species
1. *Washingtonia robusta*	20		NI
2. *Quercus agrifolia*	40		NI
3. *Salix lasiolepis*	30		FACW
4.			
Total Cover: 90%			

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)

Sampling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: %			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	X1=
FACW species 30	X2=60
FAC species	X3=0
FACU species	X4=0
UPL species 0	X5=0
Column Totals: 30 (A)	60 (B)
Prevalence Index=B/A=	2.0

Herb Stratum			
1.			
2.			
3.			
4.			
Total Cover: %			

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is <3.0[1]
Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum			
Total Cover:			

Hydrophytic Vegetation Present: Yes No√

%Bare Ground in Herb Stratum: %	30% Cover of Biotic Crust

Hydrophytic Vegetation Present: Yes No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-1-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 6/3						Shaly clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 1

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 1
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 1with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 1 receives surface flow from storm events from overside drain off of Olympiad Road.

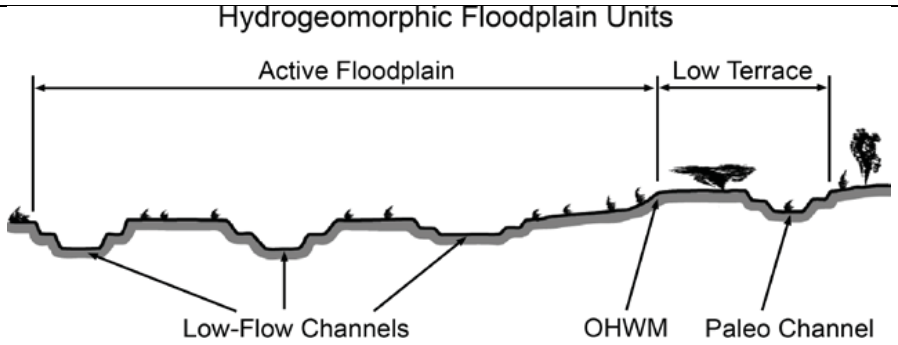
Brief site description: Unnamed Drainage 1 begins at overside drain off of Olympiad Road north of the existing and traverses the project site from the west to east before flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 1 on the project site.

Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

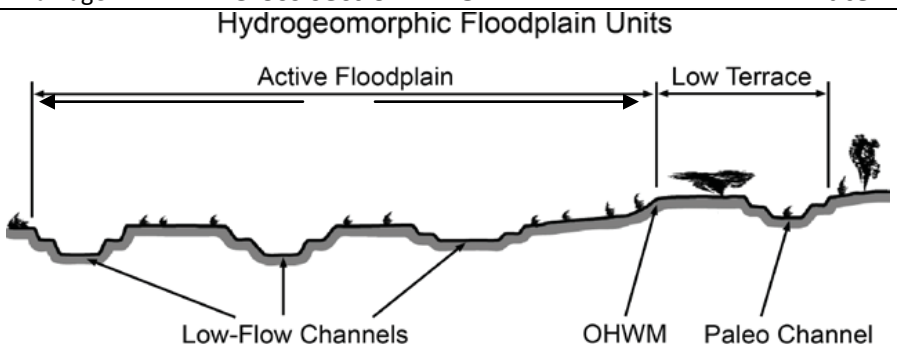


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 1-2 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 90% Tree: 90%Shrub: 0 % Herb: 0%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
□Mid (herbaceous, shrubs, saplings)
xLate (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 2-1
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species	Dominance Test worksheet:
1.				Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
2.				Number of Dominant Species Across All Strata: 0 (B)
3.				Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)
4.				
Total Cover: %				

Sampling/Shrub Stratum				Prevalence Index worksheet:	
1. *Stephanomeria diegensis*	80		NI	Total % Cover of:	Multiply by:
2. *Erigeron canadensis*	10		NI	OBL species 0	X1=
3. *Brassica nigra*	10		NI	FACW species 0	X2=0
4.				FAC species	X3=0
5.				FACU species	X4=0
6.				UPL species 0	X5=0
7.				Column Totals: 0 (A)	0 (B)
8.				Prevalence Index=B/A=	0
Total Cover: 100%					

Herb Stratum				Hydrophytic Vegetation Indicators:
1.				Dominance Test is >50%
2.				Prevalence Index is <3.0[1]
3.				Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
4.				Problematic Hydrophytic Vegetation[1] (Explain) [1]Indicators of hydric soil and wetland hydrology must be present.
Total Cover: %				

Woody Vine Stratum				Hydrophytic Vegetation Present:	
				Yes	No√
Total Cover:					

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust	Hydrophytic Vegetation Present:	
		Yes	No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-2-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 2

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 2
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 2with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 2 receives surface flow from storm events from landscape maintenance area.

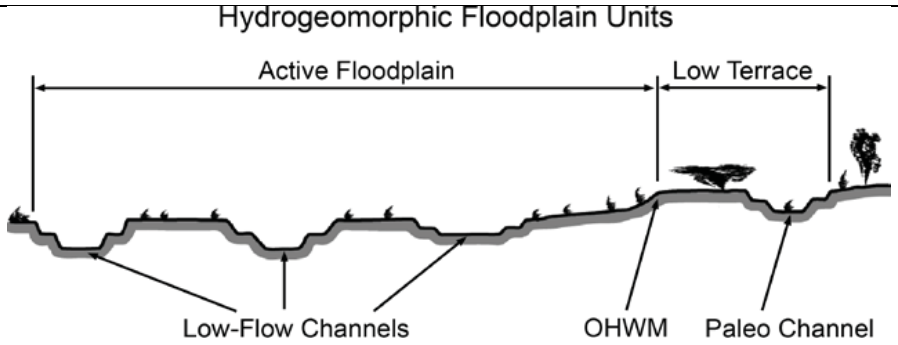
Brief site description: Unnamed Drainage 2 begins at edge of landscape maintenance area and traverses the project site from the north to south before joining a west to east tributary continuing south and then joining with Drainage 3 and then flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 2 on the project site.

Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

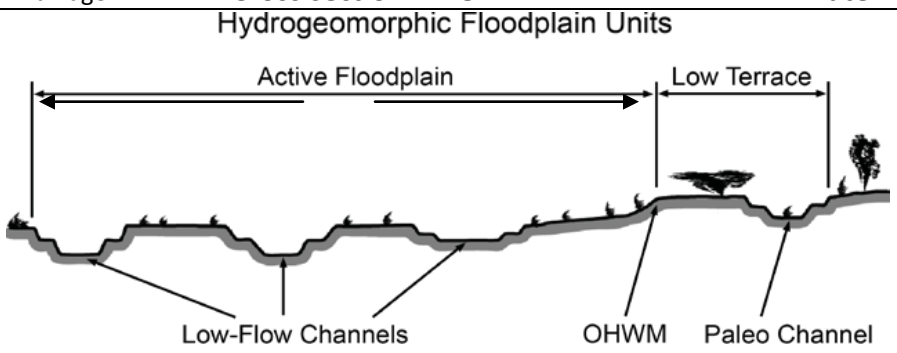


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 2-1 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 0%Shrub: 100 % Herb: 0%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
xMid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 2-2
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species	Dominance Test worksheet:
1. *Salix lasiolepis*	50		FACW	Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
2.				Number of Dominant Species Across All Strata: 0 (B)
3.				Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)
4.				
Total Cover: 50%				

Sampling/Shrub Stratum				Prevalence Index worksheet:	
1. *Frangula californica*	20		NI	Total % Cover of:	Multiply by:
2. *Baccharis pilularis*	20		NI	OBL species 0	X1=
3.				FACW species 50	X2=100
4.				FAC species 10	X3=30
5.				FACU species	X4=0
6.				UPL species 0	X5=0
7.				Column Totals: 60 (A)	130 (B)
8.				Prevalence Index=B/A=	2.17
Total Cover: 40%					

Herb Stratum				Hydrophytic Vegetation Indicators:
1. *Urtica dioica*	10		FAC	Dominance Test is >50%
2.				Prevalence Index is <3.0[1]
3.				Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
4.				Problematic Hydrophytic Vegetation[1] (Explain) [1]Indicators of hydric soil and wetland hydrology must be present.
Total Cover: 10%				

Woody Vine Stratum				Hydrophytic Vegetation Present:	
				Yes	No√
Total Cover:					

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust	Hydrophytic Vegetation Present:	
		Yes	No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-2-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 2

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 2
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 2with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 2 receives surface flow from storm events from landscape maintenance area.

Brief site description: Unnamed Drainage 2 begins at edge of landscape maintenance area and traverses the project site from the north to south before joining a west to east tributary continuing south and then joining with Drainage 3 and then flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 2 on the project site.

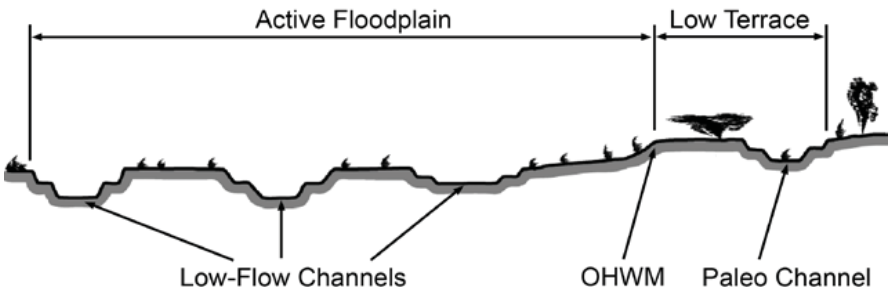
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

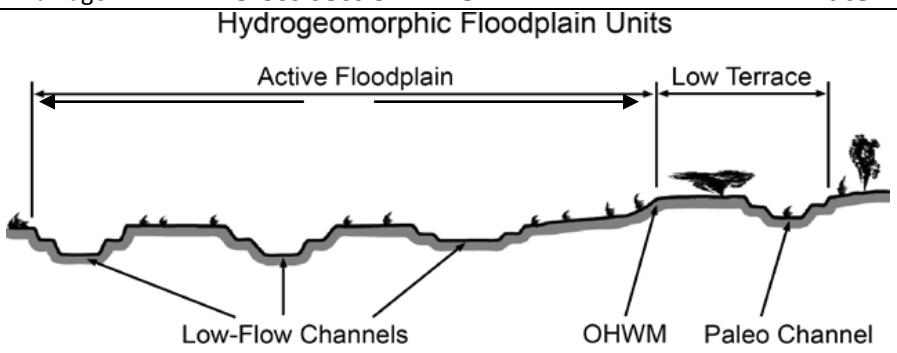


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 2-2 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 0%Shrub: 100 % Herb: 0%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
xMid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 2-3
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species
1. *Quercus agrifolia*	40		NI
2. *Sambucus nigra ssp. caerulea*	20		FAC
3.			
4.			
Total Cover:	60%		

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)

Sampling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	0%		

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	X1=
FACW species	X2=0
FAC species 20	X3=60
FACU species 20	X4=80
UPL species 0	X5=0
Column Totals: 50 (A)	140 (B)
Prevalence Index=B/A=	2.8

Herb Stratum			
1. *Avena barbata*	20		NI
2. *Bromus hordeaceus*	20		FACU
3.			
4.			
Total Cover:	40%		

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is <3.0[1]
Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum			
Total Cover:			

Hydrophytic Vegetation Present: Yes No√

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust

Hydrophytic Vegetation Present: Yes No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-2-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 2

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 2
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 2with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 2 receives surface flow from storm events from landscape maintenance area.

Brief site description: Unnamed Drainage 2 begins at edge of landscape maintenance area and traverses the project site from the north to south before joining a west to east tributary continuing south and then joining with Drainage 3 and then flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 2 on the project site.

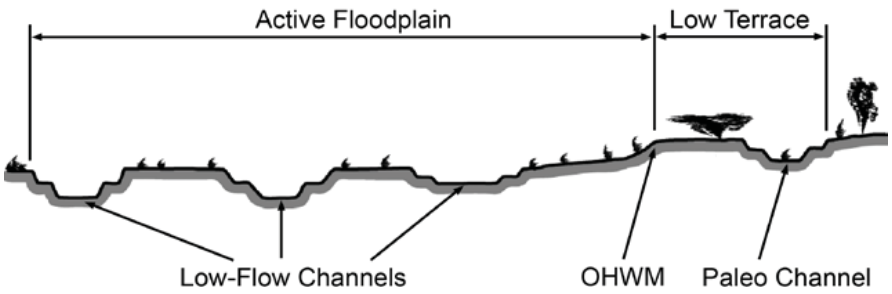
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

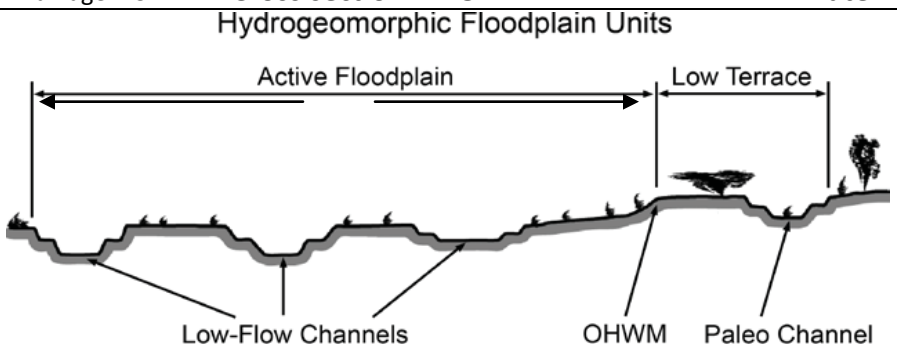


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 2-3 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 60%Shrub: 40 % Herb: 0%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
xMid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 2-4
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species
1. *Quercus agrifolia*	20		NI
2.			
3.			
4.			
Total Cover:	20%		

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)

Sampling/Shrub Stratum			
1. *Salix lasiolepis*	20		FACW
2. *Baccharis pilularis*	30		NI
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	50%		

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	X1=
FACW species 20	X2=40
FAC species 0	X3=0
FACU species 0	X4=0
UPL species 0	X5=0
Column Totals: 20 (A)	40 (B)
Prevalence Index=B/A=	2.0

Herb Stratum			
1. *Stephanomeria diegensis*	30		NI
2.			
3.			
4.			
Total Cover:	30%		

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is <3.0[1]
Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum			
Total Cover:			

Hydrophytic Vegetation Present: Yes No√

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust

Hydrophytic Vegetation Present: Yes No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-2-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators: Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 2

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 2
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 2with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 2 receives surface flow from storm events from landscape maintenance area.

Brief site description: Unnamed Drainage 2 begins at edge of landscape maintenance area and traverses the project site from the north to south before joining a west to east tributary continuing south and then joining with Drainage 3 and then flowing offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 2 on the project site.

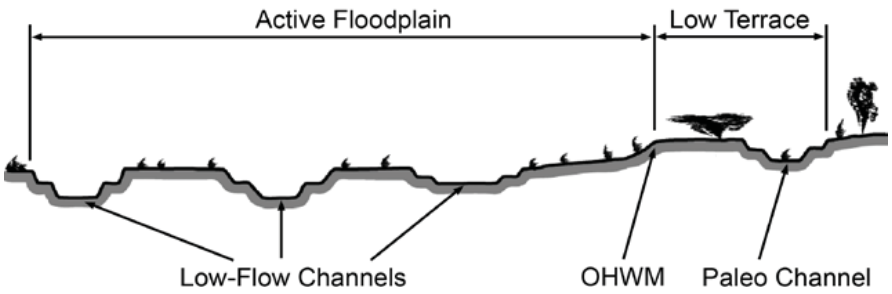
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

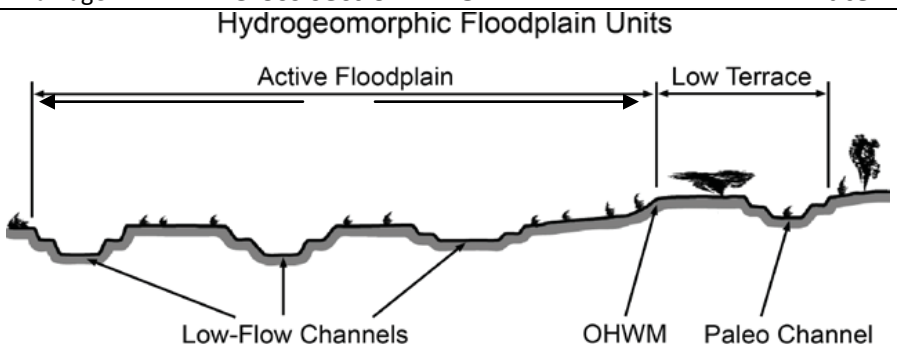


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 2-4 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 20%Shrub: 50 % Herb: 30%

Community successional stage:

□NA
□Early (herbaceous & seedlings)
xMid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 3-1
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species
1. *Quercus agrifolia*	10		NI
2.			
3.			
4.			

Total Cover: 10 %

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)

Sampling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

Total Cover: 0%

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	X1=
FACW species 0	X2=0
FAC species 0	X3=0
FACU species 0	X4=0
UPL species 0	X5=0
Column Totals: 0 (A)	0 (B)
Prevalence Index=B/A=	0

Herb Stratum			
1. *Cynara cardunculus*	100		NI
2.			
3.			
4.			

Total Cover: 100%

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is <3.0[1]
Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum			

Total Cover:

Hydrophytic Vegetation Present: Yes No√

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust

Hydrophytic Vegetation Present: Yes No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-3-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 3

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 3
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 3 with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 3 receives surface flow from storm events from overside drain off of Olympiad Road.

Brief site description: Unnamed Drainage 3 begins at overside drainage off of Olympiad Road and traverses the project site from the west to east before dividing. One fork joins Drainage 2 and another flows offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 3 on the project site.

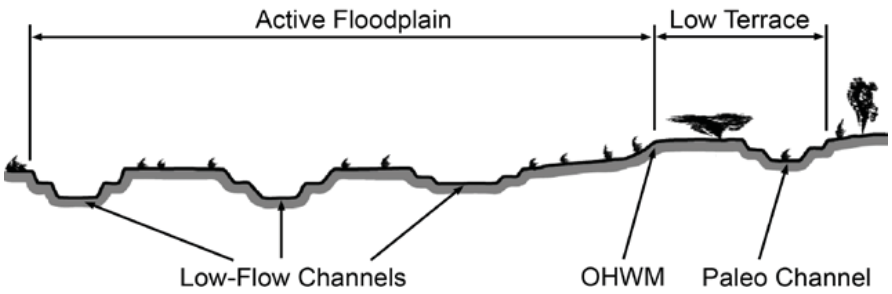
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

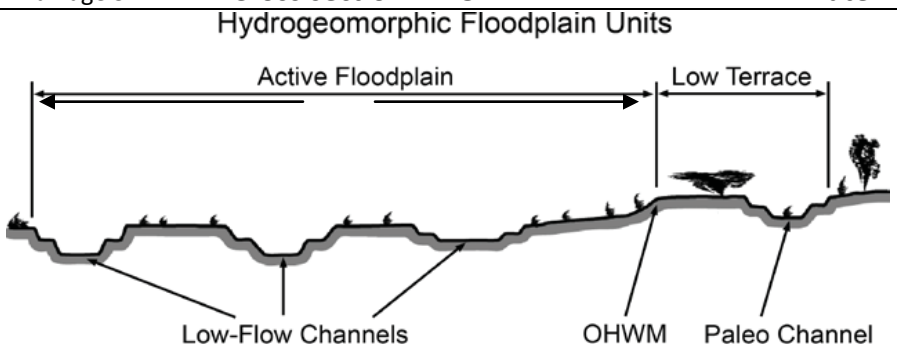


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 3-1 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 0%Shrub: 0 % Herb: 100%

Community successional stage:

□NA
XEarly (herbaceous & seedlings)
□Mid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US

WETLAND DETERMINATION DATA FORM-Arid West Region

Project/Site :Mission Viejo Curtis Park		City/County: Mission Viejo/Orange	Sampling Date: 9-15-19
Applicant / Owner : City of Mission Viejo		State: CA	Sampling Point: Unnamed Drainage 3-2
Investigators: Teresa Gonzales and Paul Gonzales		Section, Township, Range: San Juan Capistrano quadrangle Township 6 South, Range 7 West, Section 32	
Landform (hilltop,terrace.etc.) hilltop to terrace		Local relief (concave, convex, none): Concave	Slope (%): 11%
Subregion (LRR): LRR D	Lat: 33.631663˚ N	Long: -117.631663˚ W	Datum:
Soil Map Unit Name: Alo-Bosanko association		NWI classification: 137.256.28.1.182.5811, 137.256.28.1.182.7000 Riverine Lower intermittent. Subclass vegetated streambeds, nonpersistent intermittently-flooded regime, freshwater, coastal canyon drainages, woodland tree types (Q. agrifolia) and *mixed vascular plant dominance*	
Are climatic/hydrologic conditions on the site typical for this time of year?	Yes: √	No:	If no, explain in Remarks.
Are Vegetation , Soil , or Hydrology significantly disturbed?	Are "Normal Circumstances" present?	Yes: √	No:
Are Vegetation , Soil , or Hydrology naturally problematic?	(If needed, explain any answers in Remarks)		

SUMMARY OF FINDINGS-(Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No √	Is the Sampled Area within a Wetland? Yes No √
Hydric Soil Present?	Yes√	No	
Wetland Hydrology Present?	Yes√	No	
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Species
1. *Quercus agrifolia*	10		NI
2.			
3.			
4.			
Total Cover: 10 %			

Dominance Test worksheet:
Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL,FACW, or FAC: 0% (A/B)

Sampling/Shrub Stratum			
1. *Stephanomeria diegensis*	50		NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 50%			

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	X1=
FACW species 0	X2=0
FAC species 0	X3=0
FACU species 0	X4=0
UPL species 0	X5=0
Column Totals: 0 (A)	0 (B)
Prevalence Index=B/A=	0

Herb Stratum			
1. *Hirschfeldia incana*	20		NI
2. *Bromus madritensis ssp. rubens*	10		NI
3. *Bromus diandrus*	10		NI
4.			
Total Cover: 40%			

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is <3.0[1]
Morphological Adaptations[1](Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Woody Vine Stratum			
Total Cover:			

Hydrophytic Vegetation Present: Yes / No√

%Bare Ground in Herb Stratum: %	0% Cover of Biotic Crust

Hydrophytic Vegetation Present: Yes / No√

Remarks: In Drainage channel

SOIL

Sampling Point: Unnamed Drainage-3-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color(moist)	%	Type[1]	Loc[2]	Texture	Remarks
22"	10 YR 4/1						Dark gray clayey loam	Sticky and plastic

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

					Indicators for Problematic Hydric Soils[3]:
	Histosol (A1)		Sandy Redox (S5)		1 cm Muck (A9) (LRR C)
	Histic Epipedon (A2)	√	Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)
	Black Histic (A3)	√	Loamy Mucky Mineral (F1)		Reduced Vertic (F18)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F 2)		Red Parent Material (TF 2)
	Stratified Layers (A5) (LRR C)		Depleted Matrix (F3)		Other (Explain in Remarks)
	1 cm Muck (A9) (LRR D)		Redox Dark Surface (F6)		
	Depleted Below Dark Surface (A 11)		Depleted Dark Surface (F7)		
	Thick Dark Surface (A 12)		Redox Depressions (F8)		
	Sandy Mucky Mineral (S1)		Vernal Pools (F9)		
	Sandy Gleyed Matrix (S4)				[3] Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (If present):

Type: Depth (inches):	Hydric Soil Present? Yes No Fluvial soils √

Remarks: Drainage soils with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Secondary Indicators (2 or more required)

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Salt Crust (B11)	√	Water Marks (B1) (Riverine)
	High Water Table (A2)		Biotic Crust (B12)	√	Sediment Deposits (B2) (Riverine)
	Saturation(A3)		Aquatic Invertebrates (B13)	√	Drift Deposits (B3) (Riverine)
	Water Marks (B1) (Nonriverine)		Hydrogen Sulfide Odor (C1)	√	Drainage Patterns (B10)
	Sediment Deposits (B2) (Nonriverine)		Oxidized Rhizospheres along Living Roots (C3)		Dry-Season Water Table (C2)
	Drift Deposits (B3) (Nonriverine)		Presence of Reduced Iron (C4)		Thin Muck Surface (C7)
	Surface Soil Cracks (B6)		Recent Iron Reduction in Plowed Soils (C6)		Crayfish Burrows (C8)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Saturation Visible on Aerial Imagery (C90
	Water-Stained Leaves (B9)				Shallow Aquitard (D3)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No√		Depth (inches):		Wetland Hydrology Present:
Water Table Present?	Yes		No√		Depth (inches):		Yes No√
Saturation Present? (includes capillary fringe)	Yes		No√		Depth (inches):		

Describe Recorded Data (stream gauge, monitoring well, aerial photos), if available:
Orange County Hydrology Manual
Local Rain Gage
2019 Aerial Photos

Remarks: waters of US –Unnamed Drainage 3

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Mission Viejo-Curtis **Date:** 9-15-19
Project Number: **Town:** Mission Viejo **State:** CA
Stream: Unnamed Drainage 3
Investigator(s): Teresa Gonzales and Paul Gonzales
Y x/ N □Do normal circumstances exist on the site? **Location Details:** Unnamed Drainage 3 with surface runoff and storm runoff

Y □/ N x Is the site significantly disturbed? **Projection:** **Datum:**
Coordinates: 33.631663˚n /-117.631663˚w

Potential anthropogenic influences on the channel system: Unnamed Drainage 3 receives surface flow from storm events from overside drain off of Olympiad Road.

Brief site description: Unnamed Drainage 3 begins at overside drainage off of Olympiad Road and traverses the project site from the west to east before dividing. One fork joins Drainage 2 and another flows offsite. There are signs of hydrology (i.e. Drift lines, sediment deposits, and shelving) throughout the length of Unnamed Drainage 3 on the project site.

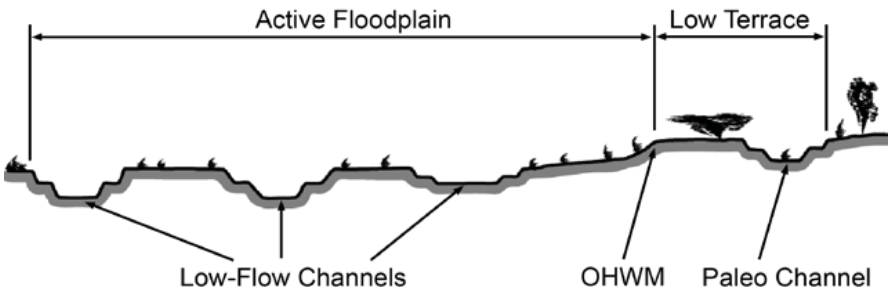
Checklist of resources (if available):

x Aerial photography
Dates: 2019
xTopographic maps
□Geologic maps
x Vegetation maps
x Soils maps
x Rainfall/precipitation maps
Existing delineation(s) for site

xGlobal positioning system (GPS)
xOther studies

XStream gage data
Gage number: 21CAOCSD-DCC
Period of record:
XHistory of recent effective discharges
□History of recent effective discharges
□Results of flood frequency analysis
□Most recent shift-adjusted rating
□Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

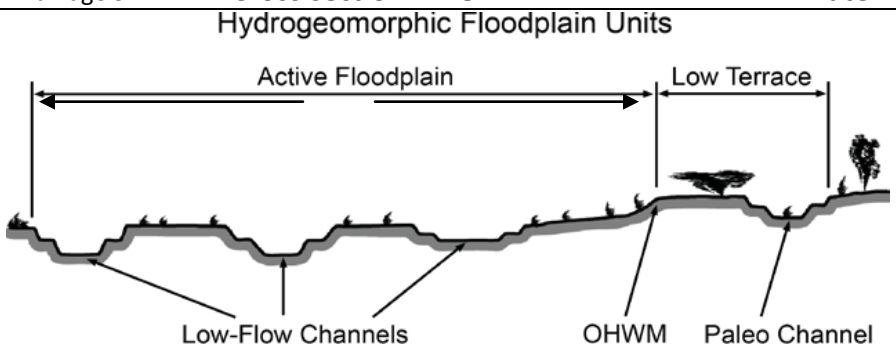


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:

x Mapping on aerial photograph
□Digitized on computer
xGPS
□Other:

Project ID: Unnamed Drainage 3-2 **Cross section ID: OHWM** **Date:** 9-15-19

Cross section drawing:



OHWM

GPS point: gps

Indicators:

xChange in average sediment texture
xChange in vegetation species
xChange in vegetation cover
x Break in bank slope
□Other: _____
□Other: _____

Comments:

Floodplain unit: □Low-Flow Channel xActive Floodplain □Low Terrace

GPS point:

Characteristics of the floodplain unit:

Average sediment texture: silt/clay

Total veg cover: 100% Tree: 10%Shrub: 50 % Herb: 40%

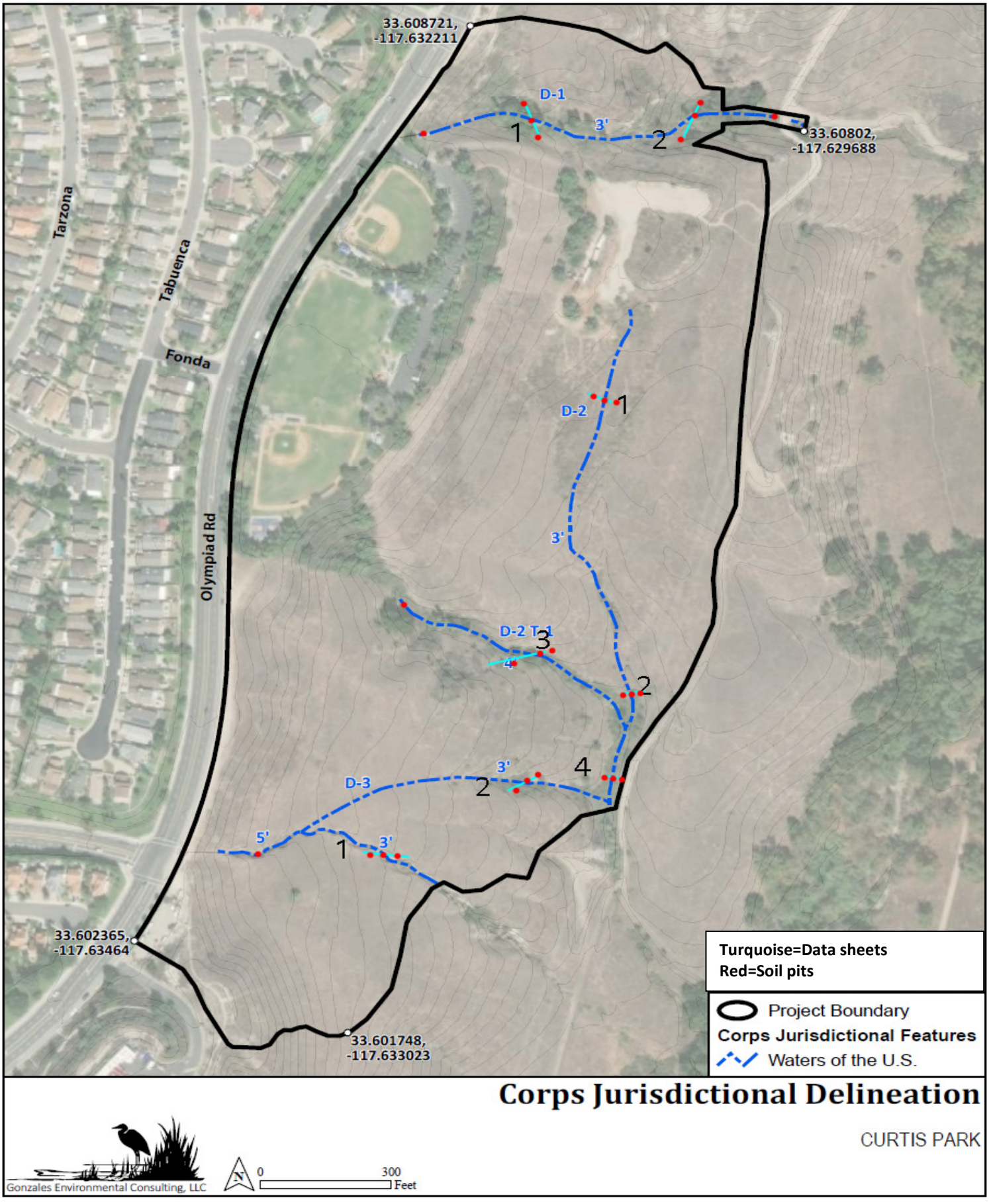
Community successional stage:

□NA
XEarly (herbaceous & seedlings)
□Mid (herbaceous, shrubs, saplings)
□Late (herbaceous, shrubs, mature trees)

Indicators:

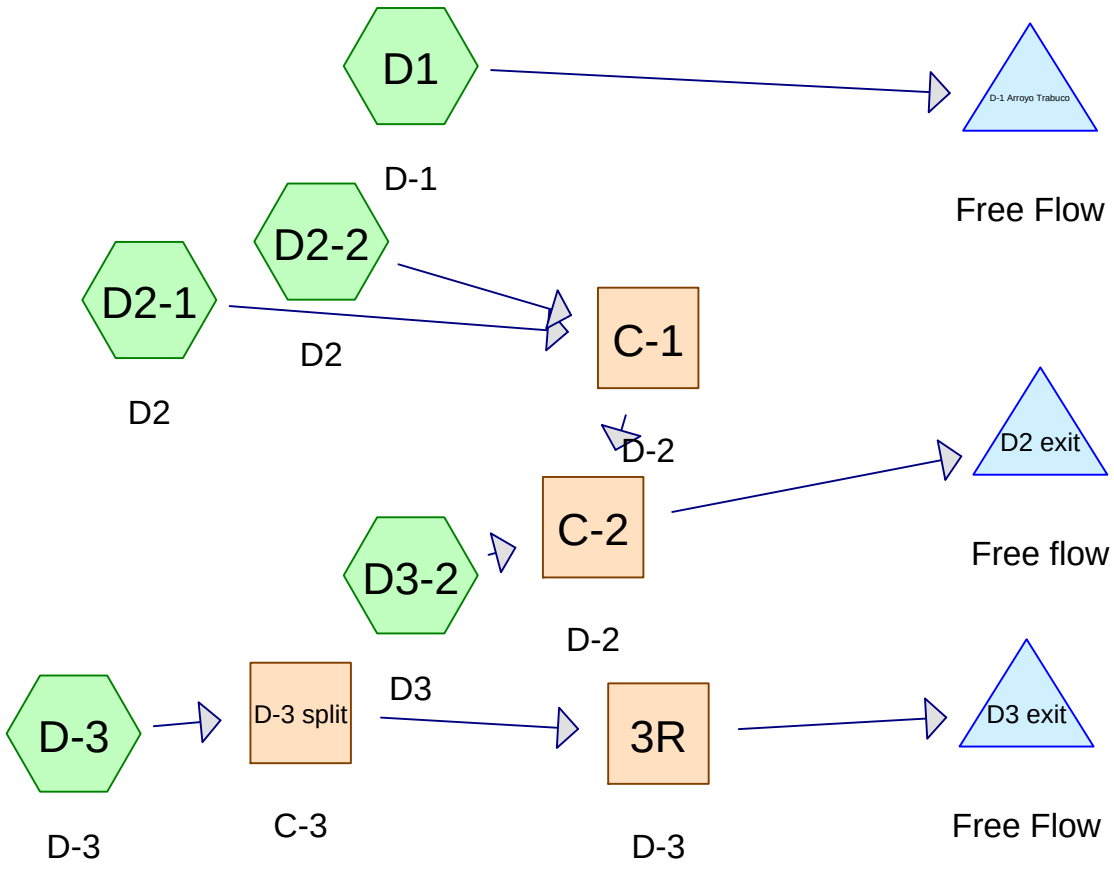
□Mudcracks
□Ripples
x Drift and/or debris
x Presence of bed and bank
x Benches
xSoil development
xSurface relief
□Other: _____
□Other: _____
□Other: _____

Comments: Waters of US


33.608721,
-117.632211
D-1
1
3'
2
33.60802,
-117.629688
Tarzona
Tabuenca
Fonda
Olympiad Rd
D-2
1
3'
D-2 T-1
3
4
2
4
3'
D-3
2
3'
5'
1
3'
33.602365,
-117.63464
33.601748,
-117.633023
Turquoise=Data sheets
Red=Soil pits
Project Boundary
Corps Jurisdictional Features
Waters of the U.S.
Corps Jurisdictional Delineation
CURTIS PARK
Gonzales Environmental Consulting, LLC
N
0
300
Feet

APPENDIX D

HYDROCAD REPORT



Subcat Reach Pond Link

Routing Diagram for Mission Viejo Curtis
Prepared by Gonzales Environmental Consulting, LLC, Printed 11/13/2019
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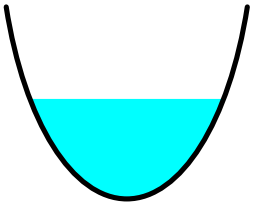
Summary for Reach 3R: D-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 1.17" for 2 yr event
Inflow = 72.52 cfs @ 9.88 hrs, Volume= 6.246 af
Outflow = 71.88 cfs @ 9.88 hrs, Volume= 6.244 af, Atten= 1%, Lag= 0.2 min

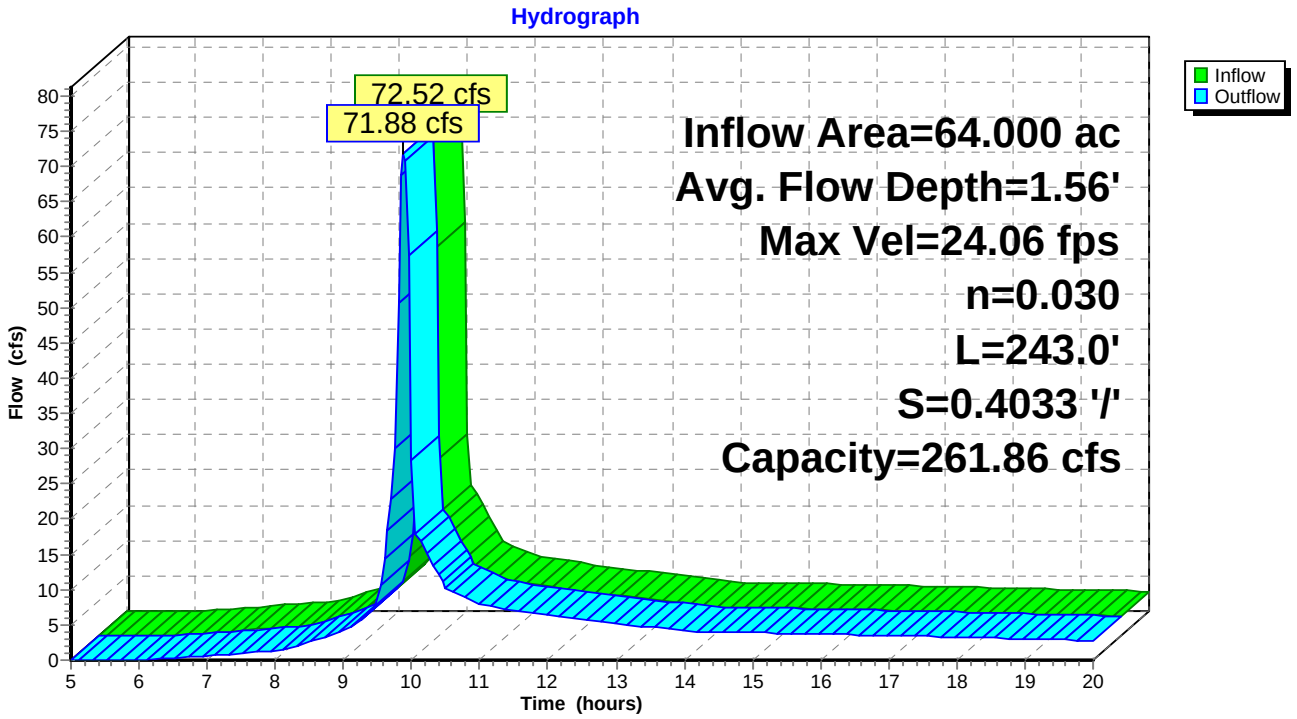
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 24.06 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 11.04 fps, Avg. Travel Time= 0.4 min

Peak Storage= 727 cf @ 9.88 hrs
Average Depth at Peak Storage= 1.56' , Surface Width= 2.88'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 261.86 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 243.0' Slope= 0.4033 '/'
Inlet Invert= 727.00', Outlet Invert= 629.00'



Reach 3R: D-3



Hydrograph for Reach 3R: D-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	727.00	0.00
5.25	0.00	0	727.00	0.00
5.50	0.00	0	727.00	0.00
5.75	0.00	0	727.00	0.00
6.00	0.07	5	727.05	0.07
6.25	0.18	9	727.08	0.17
6.50	0.31	14	727.11	0.30
6.75	0.47	18	727.13	0.46
7.00	0.65	23	727.16	0.64
7.25	0.82	28	727.18	0.81
7.50	0.99	32	727.19	0.98
7.75	1.16	35	727.21	1.15
8.00	1.34	39	727.22	1.33
8.25	1.89	50	727.26	1.87
8.50	2.57	62	727.30	2.55
8.75	3.36	76	727.34	3.33
9.00	4.28	90	727.39	4.25
9.25	5.86	113	727.45	5.82
9.50	8.11	143	727.53	7.99
9.75	**30.98**	**380**	**728.01**	**30.03**
10.00	**25.17**	**345**	**727.95**	**28.41**
10.25	14.46	219	727.70	14.51
10.50	10.26	170	727.59	10.29
10.75	8.92	155	727.56	9.02
11.00	7.92	141	727.52	7.90
11.25	7.47	136	727.51	7.51
11.50	7.12	130	727.50	7.11
11.75	6.70	125	727.48	6.72
12.00	6.30	120	727.47	6.31
12.25	6.04	116	727.46	6.05
12.50	5.79	112	727.45	5.79
12.75	5.52	109	727.44	5.53
13.00	5.25	105	727.43	5.26
13.25	4.97	101	727.42	4.98
13.50	4.69	97	727.41	4.70
13.75	4.40	92	727.39	4.41
14.00	4.11	88	727.38	4.12
14.25	4.06	87	727.38	4.06
14.50	4.01	86	727.38	4.01
14.75	3.96	85	727.37	3.96
15.00	3.91	85	727.37	3.91
15.25	3.86	84	727.37	3.86
15.50	3.81	83	727.37	3.81
15.75	3.76	82	727.36	3.76
16.00	3.71	81	727.36	3.71
16.25	3.65	81	727.36	3.65
16.50	3.60	80	727.36	3.60
16.75	3.54	79	727.35	3.54
17.00	3.49	78	727.35	3.49
17.25	3.43	77	727.35	3.43
17.50	3.37	76	727.35	3.38
17.75	3.32	75	727.34	3.32
18.00	3.26	74	727.34	3.26
18.25	3.20	73	727.34	3.20
18.50	3.14	72	727.33	3.14
18.75	3.08	71	727.33	3.09
19.00	3.02	70	727.33	3.03
19.25	2.96	69	727.33	2.97
19.50	2.90	68	727.32	2.90
19.75	2.84	67	727.32	2.84
20.00	2.78	66	727.32	2.78

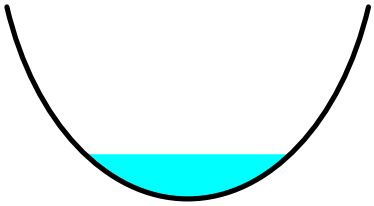
Summary for Reach C-1: D-2

Inflow Area = 38.400 ac, 0.00% Impervious, Inflow Depth > 0.47" for 2 yr event
Inflow = 7.91 cfs @ 10.16 hrs, Volume= 1.505 af
Outflow = 7.77 cfs @ 10.21 hrs, Volume= 1.500 af, Atten= 2%, Lag= 2.6 min

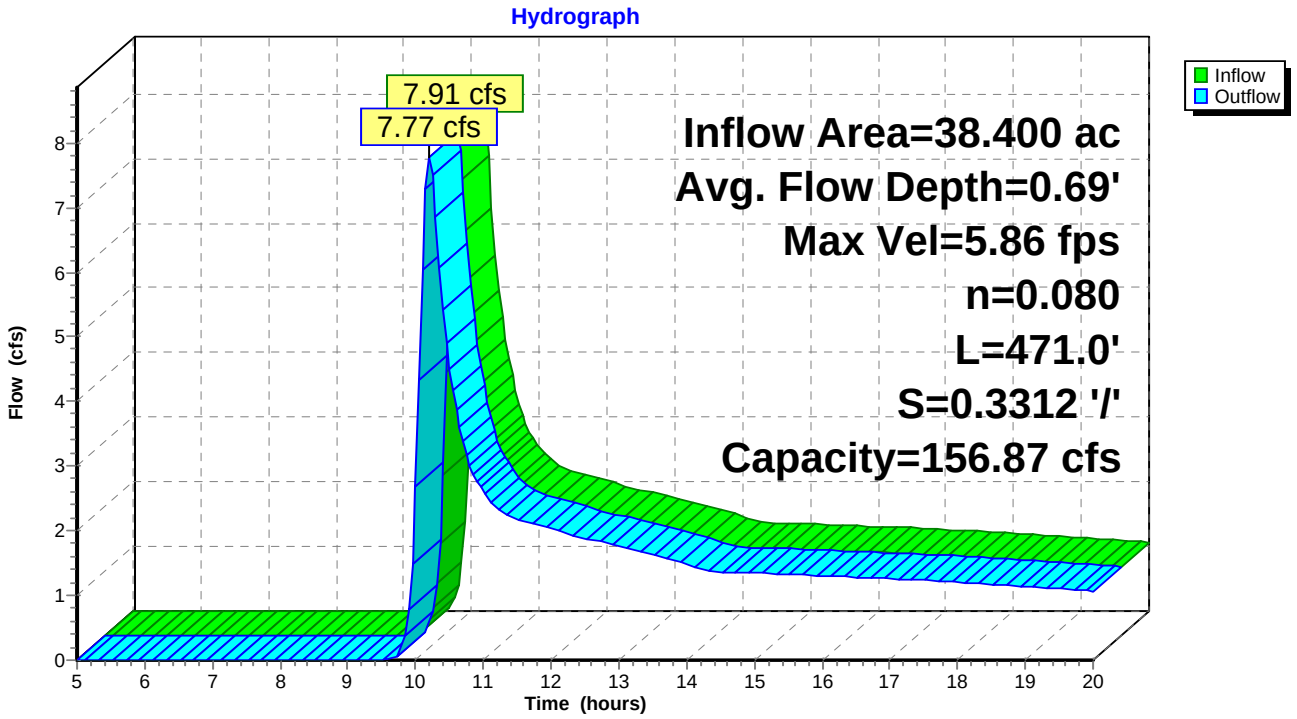
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 3.66 fps, Avg. Travel Time= 2.1 min

Peak Storage= 630 cf @ 10.18 hrs
Average Depth at Peak Storage= 0.69' , Surface Width= 2.89'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 156.87 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 471.0' Slope= 0.3312 '/'
Inlet Invert= 1,641.00', Outlet Invert= 1,485.00'



Reach C-1: D-2



Hydrograph for Reach C-1: D-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	1,641.00	0.00	18.25	1.19	165	1,641.28	1.19
5.25	0.00	0	1,641.00	0.00	18.50	1.17	163	1,641.28	1.17
5.50	0.00	0	1,641.00	0.00	18.75	1.15	162	1,641.28	1.16
5.75	0.00	0	1,641.00	0.00	19.00	1.14	160	1,641.28	1.14
6.00	0.00	0	1,641.00	0.00	19.25	1.12	158	1,641.28	1.12
6.25	0.00	0	1,641.00	0.00	19.50	1.10	156	1,641.27	1.10
6.50	0.00	0	1,641.00	0.00	19.75	1.08	155	1,641.27	1.09
6.75	0.00	0	1,641.00	0.00	20.00	1.06	153	1,641.27	1.07
7.00	0.00	0	1,641.00	0.00					
7.25	0.00	0	1,641.00	0.00					
7.50	0.00	0	1,641.00	0.00					
7.75	0.00	0	1,641.00	0.00					
8.00	0.00	0	1,641.00	0.00					
8.25	0.00	0	1,641.00	0.00					
8.50	0.00	0	1,641.00	0.00					
8.75	0.00	0	1,641.00	0.00					
9.00	0.00	0	1,641.00	0.00					
9.25	0.00	0	1,641.00	0.00					
9.50	0.00	0	1,641.00	0.00					
9.75	0.20	28	1,641.09	0.07					
10.00	**4.02**	**342**	**1,641.46**	**2.70**					
10.25	**7.04**	**596**	**1,641.67**	**7.51**					
10.50	4.21	412	1,641.52	4.49					
10.75	3.03	325	1,641.45	3.18					
11.00	2.54	284	1,641.41	2.60					
11.25	2.28	263	1,641.39	2.32					
11.50	2.17	253	1,641.38	2.19					
11.75	2.10	247	1,641.37	2.11					
12.00	2.02	240	1,641.37	2.04					
12.25	1.94	233	1,641.36	1.95					
12.50	1.88	228	1,641.35	1.89					
12.75	1.82	223	1,641.35	1.83					
13.00	1.76	218	1,641.34	1.77					
13.25	1.69	212	1,641.34	1.71					
13.50	1.62	206	1,641.33	1.64					
13.75	1.55	199	1,641.32	1.56					
14.00	1.47	192	1,641.31	1.48					
14.25	1.39	185	1,641.31	1.40					
14.50	1.36	182	1,641.30	1.37					
14.75	1.35	181	1,641.30	1.35					
15.00	1.34	180	1,641.30	1.35					
15.25	1.34	179	1,641.30	1.34					
15.50	1.33	178	1,641.30	1.33					
15.75	1.32	178	1,641.30	1.32					
16.00	1.31	177	1,641.30	1.31					
16.25	1.30	175	1,641.30	1.30					
16.50	1.29	174	1,641.29	1.29					
16.75	1.27	173	1,641.29	1.28					
17.00	1.26	172	1,641.29	1.26					
17.25	1.25	171	1,641.29	1.25					
17.50	1.23	169	1,641.29	1.24					
17.75	1.22	168	1,641.29	1.22					
18.00	1.20	166	1,641.29	1.21					

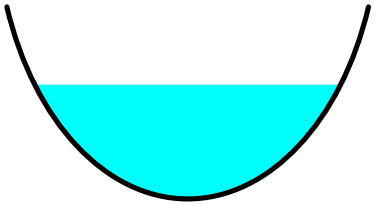
Summary for Reach C-2: D-2

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 0.90" for 2 yr event
Inflow = 53.33 cfs @ 10.14 hrs, Volume= 7.675 af
Outflow = 53.26 cfs @ 10.15 hrs, Volume= 7.673 af, Atten= 0%, Lag= 0.2 min

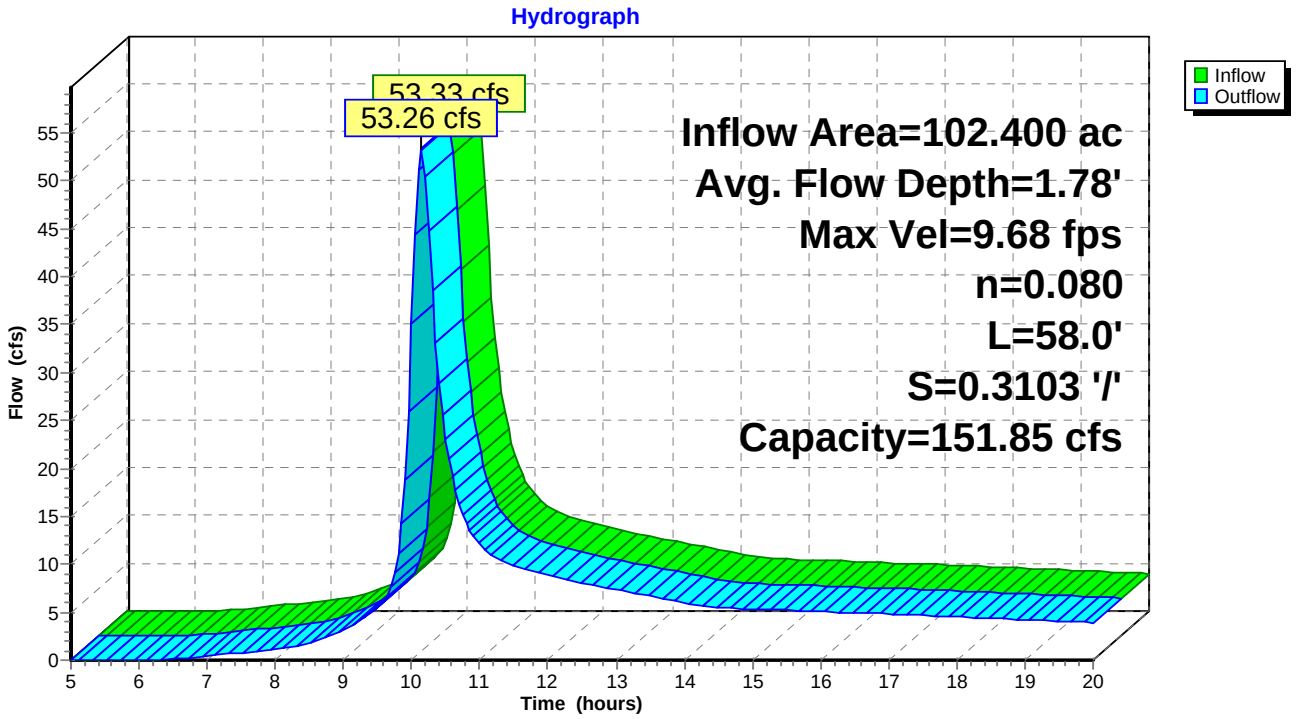
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.68 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.90 fps, Avg. Travel Time= 0.2 min

Peak Storage= 319 cf @ 10.14 hrs
Average Depth at Peak Storage= 1.78' , Surface Width= 4.63'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 151.85 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 58.0' Slope= 0.3103 '/'
Inlet Invert= 619.00', Outlet Invert= 601.00'



Reach C-2: D-2



Hydrograph for Reach C-2: D-2

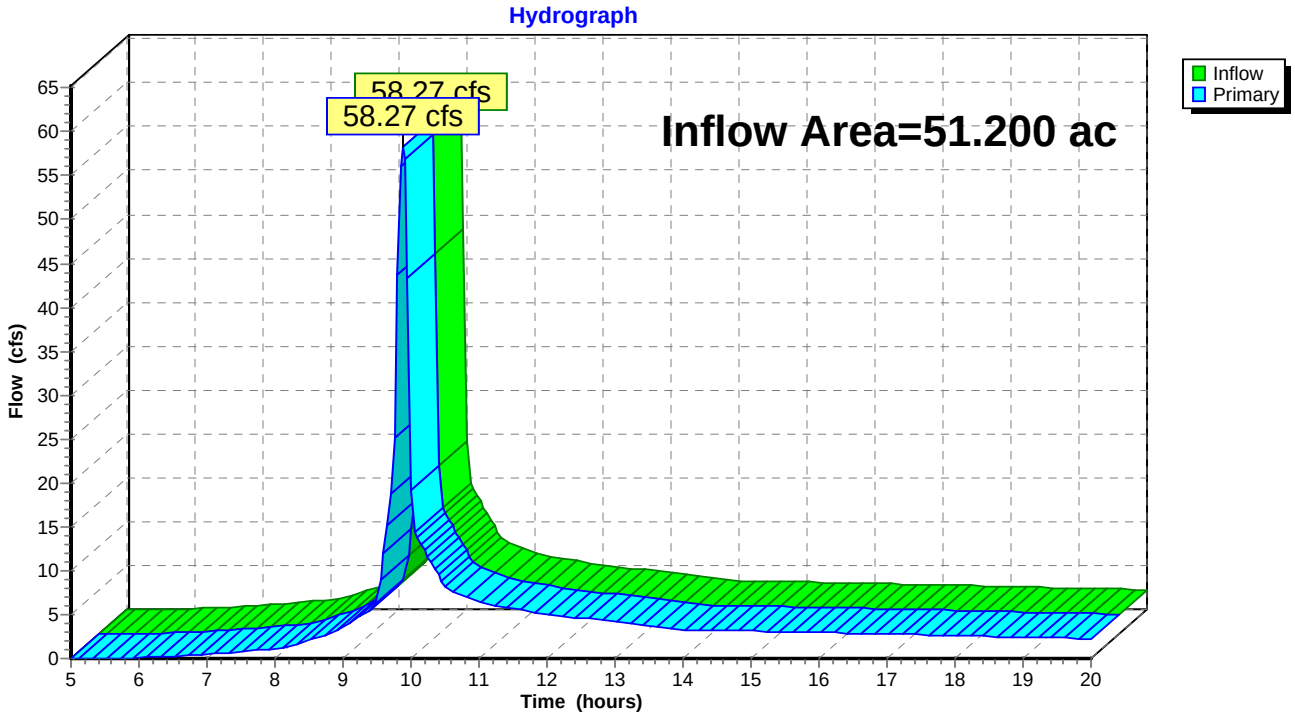
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	619.00	0.00
5.25	0.00	0	619.00	0.00
5.50	0.00	0	619.00	0.00
5.75	0.00	0	619.00	0.00
6.00	0.01	0	619.01	0.00
6.25	0.06	2	619.07	0.06
6.50	0.16	5	619.11	0.15
6.75	0.28	8	619.15	0.28
7.00	0.44	10	619.18	0.43
7.25	0.61	13	619.21	0.61
7.50	0.78	15	619.24	0.78
7.75	0.95	18	619.26	0.95
8.00	1.12	20	619.28	1.12
8.25	1.33	22	619.30	1.33
8.50	1.79	28	619.35	1.78
8.75	2.43	34	619.40	2.42
9.00	3.19	42	619.46	3.18
9.25	4.13	50	619.52	4.12
9.50	5.55	62	619.60	5.53
9.75	9.18	88	619.76	9.06
10.00	**35.58**	**236**	**620.46**	**35.00**
10.25	**44.46**	**280**	**620.64**	**44.82**
10.50	22.91	172	620.18	23.06
10.75	15.14	128	619.97	15.21
11.00	12.04	108	619.87	12.07
11.25	10.54	98	619.81	10.56
11.50	9.80	93	619.78	9.81
11.75	9.31	90	619.77	9.32
12.00	8.84	86	619.75	8.84
12.25	8.36	83	619.73	8.36
12.50	7.99	80	619.71	8.00
12.75	7.67	78	619.70	7.68
13.00	7.35	76	619.68	7.36
13.25	7.02	73	619.67	7.02
13.50	6.67	71	619.65	6.68
13.75	6.31	68	619.64	6.32
14.00	5.95	65	619.62	5.95
14.25	5.60	62	619.60	5.61
14.50	5.45	61	619.59	5.45
14.75	5.38	61	619.59	5.38
15.00	5.32	60	619.59	5.32
15.25	5.26	60	619.58	5.26
15.50	5.20	59	619.58	5.20
15.75	5.14	59	619.58	5.14
16.00	5.08	58	619.57	5.08
16.25	5.02	58	619.57	5.02
16.50	4.95	57	619.57	4.95
16.75	4.89	57	619.56	4.89
17.00	4.82	56	619.56	4.82
17.25	4.75	55	619.56	4.75
17.50	4.68	55	619.55	4.68
17.75	4.61	54	619.55	4.61
18.00	4.54	54	619.54	4.54
18.25	4.46	53	619.54	4.46
18.50	4.39	52	619.53	4.39
18.75	4.31	52	619.53	4.31
19.00	4.24	51	619.53	4.24
19.25	4.16	50	619.52	4.16
19.50	4.08	50	619.52	4.08
19.75	4.00	49	619.51	4.00
20.00	3.92	48	619.51	3.92

Summary for Pond D-1 Arroyo Trabuco: Free Flow

Inflow Area = 51.200 ac, 38.00% Impervious, Inflow Depth > 1.17" for 2 yr event
Inflow = 58.27 cfs @ 9.88 hrs, Volume= 4.998 af
Primary = 58.27 cfs @ 9.88 hrs, Volume= 4.998 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D-1 Arroyo Trabuco: Free Flow



Hydrograph for Pond D-1 Arroyo Trabuco: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00	18.25	2.56		2.56
5.25	0.00		0.00	18.50	2.51		2.51
5.50	0.00		0.00	18.75	2.47		2.47
5.75	0.00		0.00	19.00	2.42		2.42
6.00	0.06		0.06	19.25	2.37		2.37
6.25	0.14		0.14	19.50	2.32		2.32
6.50	0.25		0.25	19.75	2.27		2.27
6.75	0.38		0.38	20.00	2.22		2.22
7.00	0.52		0.52				
7.25	0.66		0.66				
7.50	0.79		0.79				
7.75	0.93		0.93				
8.00	1.08		1.08				
8.25	1.52		1.52				
8.50	2.07		2.07				
8.75	2.69		2.69				
9.00	3.44		3.44				
9.25	4.71		4.71				
9.50	6.53		6.53				
9.75	**25.15**		**25.15**				
10.00	**19.10**		**19.10**				
10.25	11.67		11.67				
10.50	8.09		8.09				
10.75	7.18		7.18				
11.00	6.30		6.30				
11.25	5.99		5.99				
11.50	5.68		5.68				
11.75	5.36		5.36				
12.00	5.03		5.03				
12.25	4.83		4.83				
12.50	4.63		4.63				
12.75	4.41		4.41				
13.00	4.20		4.20				
13.25	3.97		3.97				
13.50	3.75		3.75				
13.75	3.52		3.52				
14.00	3.29		3.29				
14.25	3.25		3.25				
14.50	3.21		3.21				
14.75	3.17		3.17				
15.00	3.13		3.13				
15.25	3.09		3.09				
15.50	3.05		3.05				
15.75	3.01		3.01				
16.00	2.96		2.96				
16.25	2.92		2.92				
16.50	2.88		2.88				
16.75	2.83		2.83				
17.00	2.79		2.79				
17.25	2.74		2.74				
17.50	2.70		2.70				
17.75	2.65		2.65				
18.00	2.61		2.61				

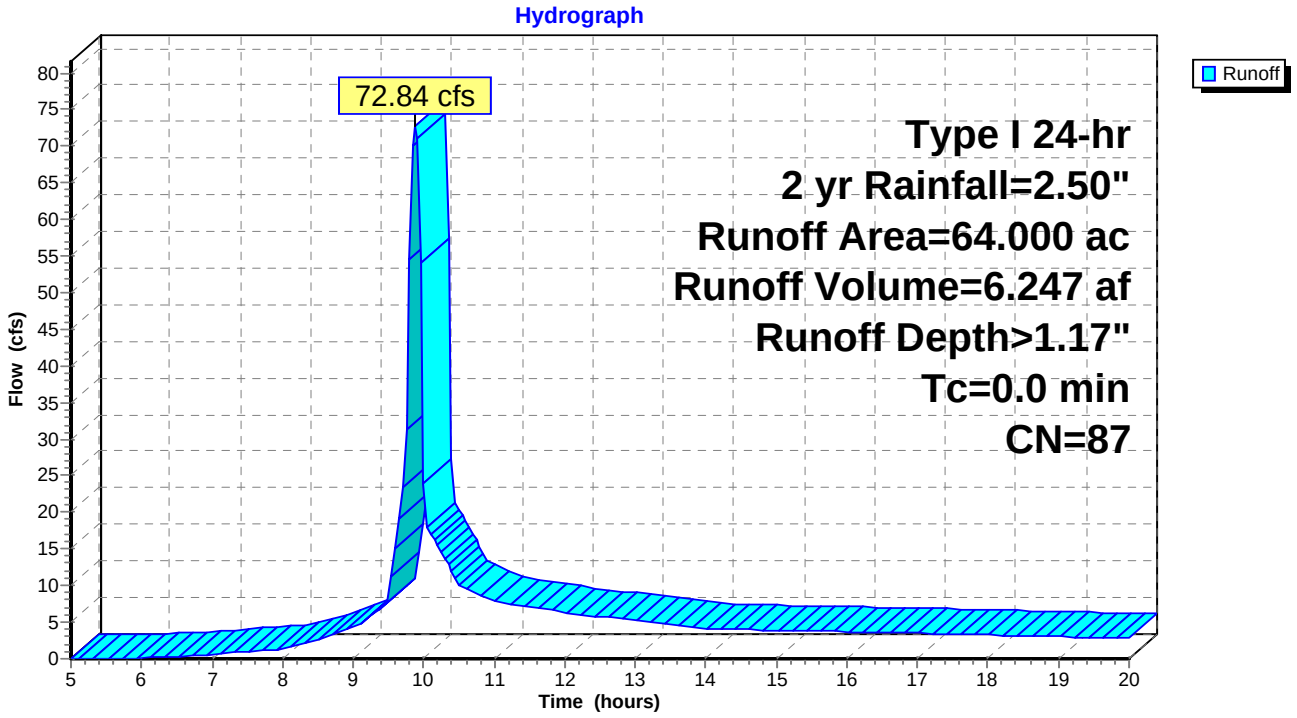
Summary for Subcatchment D-3: D-3

Runoff = 72.84 cfs @ 9.88 hrs, Volume= 6.247 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 2 yr Rainfall=2.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Subcatchment D-3: D-3



Hydrograph for Subcatchment D-3: D-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00	10.30	1.40	0.47	13.71	15.60	2.05	0.95	3.79
5.10	0.26	0.00	0.00	10.40	1.43	0.49	11.90	15.70	2.06	0.95	3.77
5.20	0.26	0.00	0.00	10.50	1.46	0.51	10.12	15.80	2.07	0.96	3.75
5.30	0.27	0.00	0.00	10.60	1.48	0.52	9.61	15.90	2.07	0.96	3.73
5.40	0.27	0.00	0.00	10.70	1.50	0.54	9.19	16.00	2.08	0.97	3.70
5.50	0.28	0.00	0.00	10.80	1.52	0.55	8.75	16.10	2.09	0.97	3.68
5.60	0.29	0.00	0.00	10.90	1.54	0.56	8.31	16.20	2.09	0.98	3.66
5.70	0.29	0.00	0.00	11.00	1.56	0.58	7.87	16.30	2.10	0.99	3.64
5.80	0.30	0.00	0.01	11.10	1.57	0.59	7.71	16.40	2.11	0.99	3.62
5.90	0.31	0.00	0.04	11.20	1.59	0.60	7.56	16.50	2.12	1.00	3.60
6.00	0.31	0.00	0.07	11.30	1.61	0.61	7.41	16.60	2.12	1.00	3.58
6.10	0.32	0.00	0.11	11.40	1.62	0.62	7.26	16.70	2.13	1.01	3.55
6.20	0.33	0.00	0.16	11.50	1.64	0.63	7.11	16.80	2.14	1.01	3.53
6.30	0.33	0.00	0.21	11.60	1.65	0.64	6.95	16.90	2.14	1.02	3.51
6.40	0.34	0.00	0.26	11.70	1.67	0.65	6.79	17.00	2.15	1.02	3.49
6.50	0.35	0.00	0.31	11.80	1.68	0.67	6.62	17.10	2.16	1.03	3.46
6.60	0.36	0.00	0.37	11.90	1.70	0.68	6.46	17.20	2.16	1.04	3.44
6.70	0.36	0.00	0.44	12.00	1.71	0.69	6.29	17.30	2.17	1.04	3.42
6.80	0.37	0.00	0.51	12.10	1.72	0.70	6.19	17.40	2.18	1.05	3.40
6.90	0.38	0.00	0.58	12.20	1.74	0.70	6.09	17.50	2.18	1.05	3.37
7.00	0.39	0.01	0.66	12.30	1.75	0.71	5.99	17.60	2.19	1.06	3.35
7.10	0.40	0.01	0.72	12.40	1.76	0.72	5.89	17.70	2.20	1.06	3.33
7.20	0.41	0.01	0.79	12.50	1.77	0.73	5.78	17.80	2.20	1.07	3.31
7.30	0.42	0.01	0.86	12.60	1.78	0.74	5.68	17.90	2.21	1.07	3.28
7.40	0.43	0.01	0.92	12.70	1.80	0.75	5.57	18.00	2.21	1.08	3.26
7.50	0.44	0.01	0.99	12.80	1.81	0.76	5.46	18.10	2.22	1.08	3.24
7.60	0.45	0.01	1.06	12.90	1.82	0.77	5.35	18.20	2.23	1.09	3.21
7.70	0.46	0.01	1.13	13.00	1.83	0.77	5.25	18.30	2.23	1.09	3.19
7.80	0.47	0.02	1.20	13.10	1.84	0.78	5.13	18.40	2.24	1.10	3.17
7.90	0.48	0.02	1.27	13.20	1.85	0.79	5.02	18.50	2.25	1.10	3.14
8.00	0.48	0.02	1.35	13.30	1.86	0.80	4.91	18.60	2.25	1.11	3.12
8.10	0.50	0.02	1.55	13.40	1.87	0.81	4.80	18.70	2.26	1.11	3.09
8.20	0.51	0.03	1.77	13.50	1.88	0.81	4.68	18.80	2.26	1.12	3.07
8.30	0.52	0.03	2.02	13.60	1.89	0.82	4.57	18.90	2.27	1.12	3.05
8.40	0.53	0.03	2.29	13.70	1.90	0.83	4.45	19.00	2.27	1.13	3.02
8.50	0.55	0.04	2.58	13.80	1.91	0.83	4.34	19.10	2.28	1.13	3.00
8.60	0.56	0.04	2.88	13.90	1.92	0.84	4.22	19.20	2.29	1.13	2.97
8.70	0.58	0.04	3.20	14.00	1.92	0.85	4.11	19.30	2.29	1.14	2.95
8.80	0.60	0.05	3.54	14.10	1.93	0.85	4.08	19.40	2.30	1.14	2.93
8.90	0.62	0.06	3.90	14.20	1.94	0.86	4.07	19.50	2.30	1.15	2.90
9.00	0.63	0.06	4.30	14.30	1.95	0.87	4.05	19.60	2.31	1.15	2.88
9.10	0.66	0.07	4.89	14.40	1.96	0.87	4.03	19.70	2.31	1.16	2.85
9.20	0.68	0.08	5.54	14.50	1.97	0.88	4.01	19.80	2.32	1.16	2.83
9.30	0.70	0.09	6.24	14.60	1.97	0.89	3.99	19.90	2.32	1.17	2.80
9.40	0.73	0.10	6.99	14.70	1.98	0.89	3.97	20.00	**2.33**	**1.17**	2.78
9.50	0.76	0.11	8.16	14.80	1.99	0.90	3.95				
9.60	0.80	0.13	15.01	14.90	2.00	0.90	3.93				
9.70	0.86	0.15	23.52	15.00	2.00	0.91	3.91				
9.80	0.97	0.21	54.52	15.10	2.01	0.92	3.89				
9.90	1.16	0.31	**71.05**	15.20	2.02	0.92	3.87				
10.00	1.29	0.39	23.87	15.30	2.03	0.93	3.85				
10.10	1.33	0.42	17.09	15.40	2.04	0.93	3.83				
10.20	1.37	0.45	15.45	15.50	2.04	0.94	3.81				

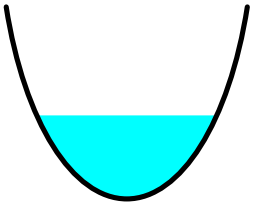
Summary for Reach D-3 split: C-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 1.17" for 2 yr event
Inflow = 72.84 cfs @ 9.88 hrs, Volume= 6.247 af
Outflow = 72.52 cfs @ 9.88 hrs, Volume= 6.246 af, Atten= 0%, Lag= 0.1 min

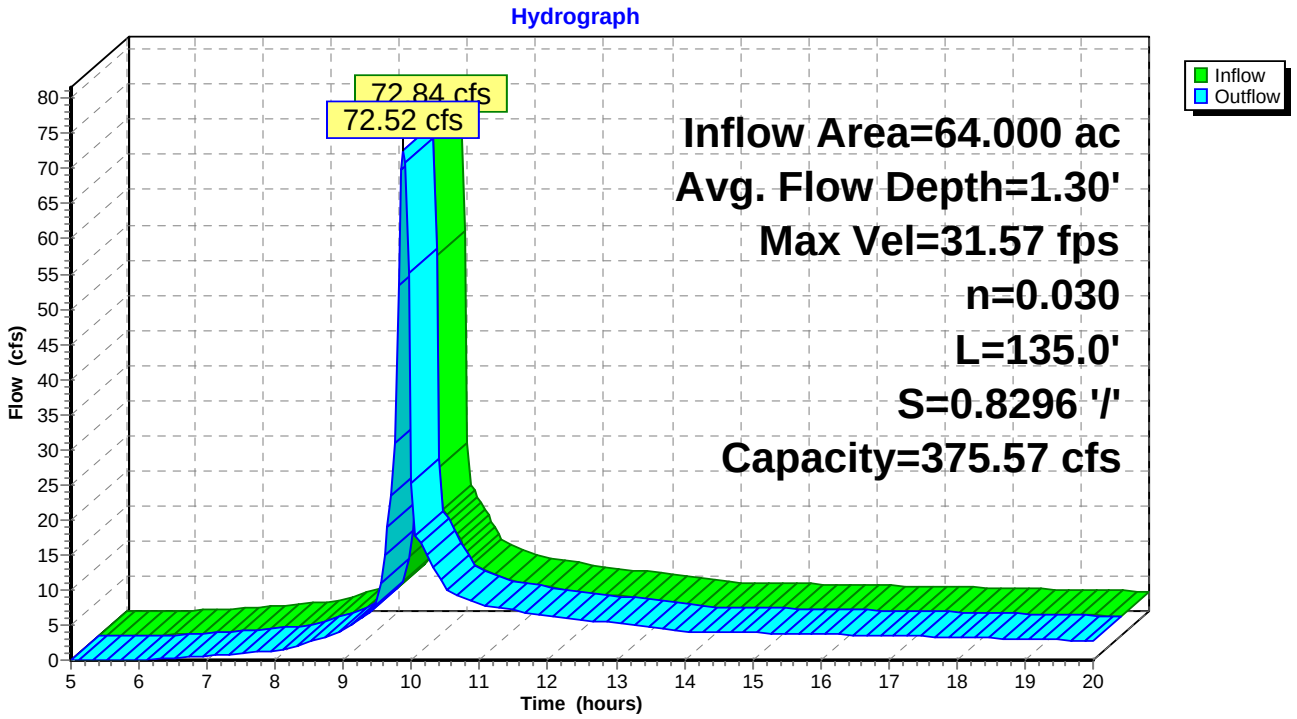
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 31.57 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 14.33 fps, Avg. Travel Time= 0.2 min

Peak Storage= 309 cf @ 9.88 hrs
Average Depth at Peak Storage= 1.30' , Surface Width= 2.64'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 375.57 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 135.0' Slope= 0.8296 '/'
Inlet Invert= 727.00', Outlet Invert= 615.00'



Reach D-3 split: C-3



Hydrograph for Reach D-3 split: C-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	727.00	0.00
5.25	0.00	0	727.00	0.00
5.50	0.00	0	727.00	0.00
5.75	0.00	0	727.00	0.00
6.00	0.07	2	727.05	0.07
6.25	0.18	4	727.07	0.18
6.50	0.31	6	727.09	0.31
6.75	0.47	8	727.11	0.47
7.00	0.66	10	727.13	0.65
7.25	0.82	12	727.15	0.82
7.50	0.99	14	727.16	0.99
7.75	1.16	15	727.18	1.16
8.00	1.35	17	727.19	1.34
8.25	1.90	22	727.22	1.89
8.50	2.58	27	727.26	2.57
8.75	3.37	33	727.29	3.36
9.00	4.30	39	727.33	4.28
9.25	5.89	49	727.38	5.86
9.50	8.16	61	727.44	8.11
9.75	**31.43**	**164**	**727.86**	**30.98**
10.00	**23.87**	**137**	**727.76**	**25.17**
10.25	14.59	93	727.59	14.46
10.50	10.12	73	727.50	10.26
10.75	8.97	66	727.46	8.92
11.00	7.87	60	727.44	7.92
11.25	7.49	58	727.43	7.47
11.50	7.11	56	727.42	7.12
11.75	6.70	53	727.40	6.70
12.00	6.29	51	727.39	6.30
12.25	6.04	50	727.38	6.04
12.50	5.78	48	727.38	5.79
12.75	5.52	46	727.37	5.52
13.00	5.25	45	727.36	5.25
13.25	4.97	43	727.35	4.97
13.50	4.68	41	727.34	4.69
13.75	4.40	40	727.33	4.40
14.00	4.11	38	727.32	4.11
14.25	4.06	37	727.32	4.06
14.50	4.01	37	727.32	4.01
14.75	3.96	37	727.31	3.96
15.00	3.91	36	727.31	3.91
15.25	3.86	36	727.31	3.86
15.50	3.81	36	727.31	3.81
15.75	3.76	35	727.31	3.76
16.00	3.70	35	727.30	3.71
16.25	3.65	35	727.30	3.65
16.50	3.60	34	727.30	3.60
16.75	3.54	34	727.30	3.54
17.00	3.49	33	727.30	3.49
17.25	3.43	33	727.29	3.43
17.50	3.37	33	727.29	3.37
17.75	3.32	32	727.29	3.32
18.00	3.26	32	727.29	3.26
18.25	3.20	31	727.28	3.20
18.50	3.14	31	727.28	3.14
18.75	3.08	31	727.28	3.08
19.00	3.02	30	727.28	3.02
19.25	2.96	30	727.27	2.96
19.50	2.90	29	727.27	2.90
19.75	2.84	29	727.27	2.84
20.00	2.78	28	727.27	2.78

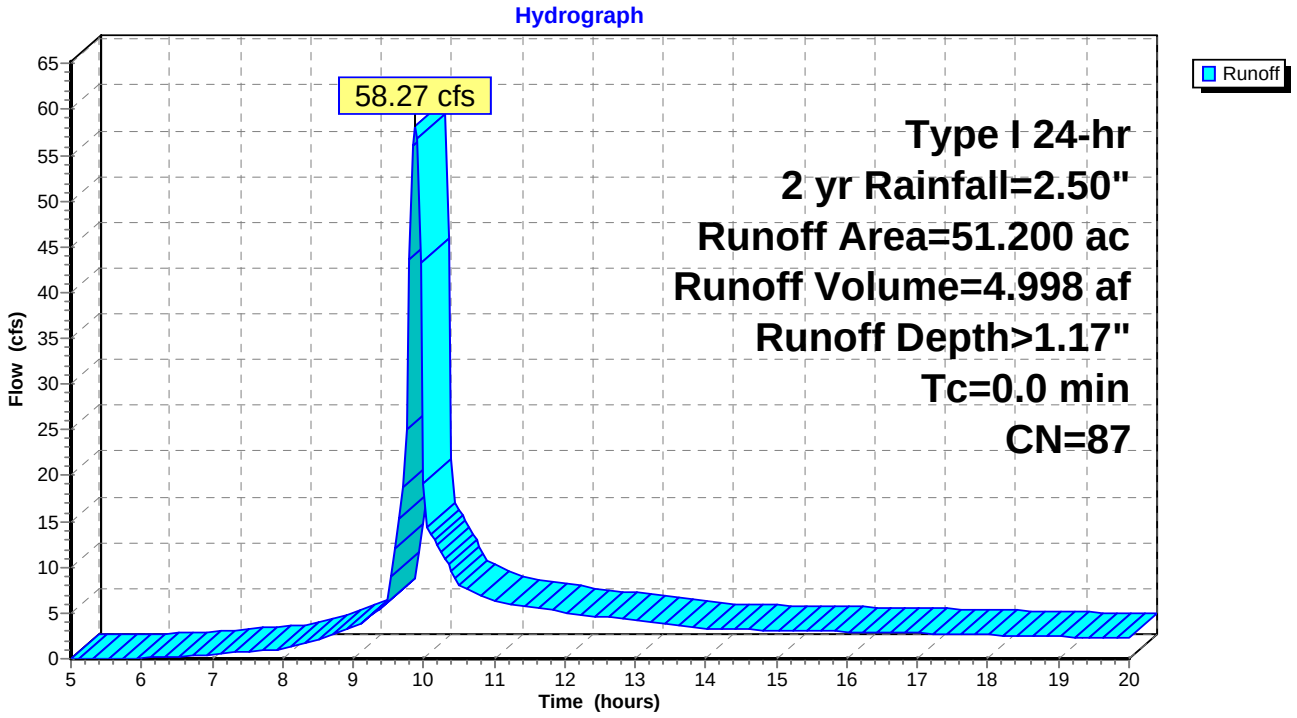
Summary for Subcatchment D1: D-1

Runoff = 58.27 cfs @ 9.88 hrs, Volume= 4.998 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 2 yr Rainfall=2.50"

Area (ac)	CN	Description
51.200	87	1/4 acre lots, 38% imp, HSG D
31.744		62.00% Pervious Area
19.456		38.00% Impervious Area

Subcatchment D1: D-1



Hydrograph for Subcatchment D1: D-1

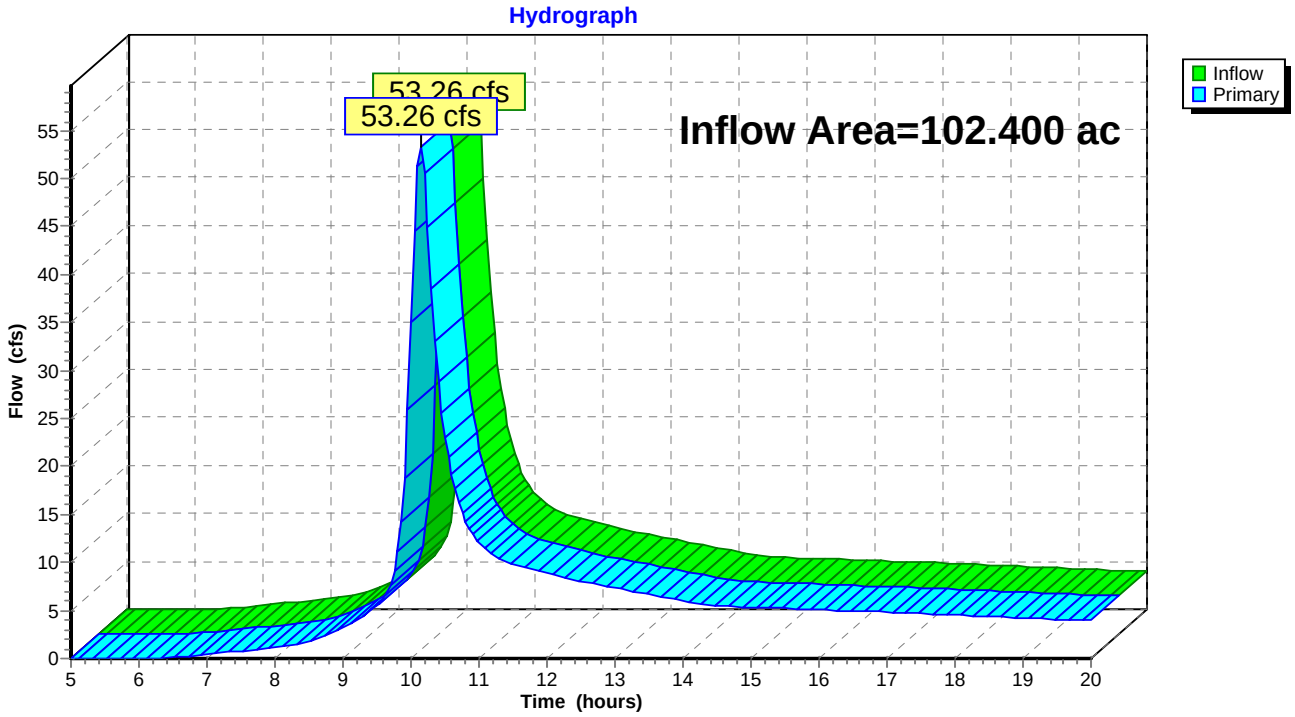
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00	10.30	1.40	0.47	10.97	15.60	2.05	0.95	3.03
5.10	0.26	0.00	0.00	10.40	1.43	0.49	9.52	15.70	2.06	0.95	3.01
5.20	0.26	0.00	0.00	10.50	1.46	0.51	8.09	15.80	2.07	0.96	3.00
5.30	0.27	0.00	0.00	10.60	1.48	0.52	7.69	15.90	2.07	0.96	2.98
5.40	0.27	0.00	0.00	10.70	1.50	0.54	7.35	16.00	2.08	0.97	2.96
5.50	0.28	0.00	0.00	10.80	1.52	0.55	7.00	16.10	2.09	0.97	2.95
5.60	0.29	0.00	0.00	10.90	1.54	0.56	6.65	16.20	2.09	0.98	2.93
5.70	0.29	0.00	0.00	11.00	1.56	0.58	6.30	16.30	2.10	0.99	2.91
5.80	0.30	0.00	0.00	11.10	1.57	0.59	6.17	16.40	2.11	0.99	2.90
5.90	0.31	0.00	0.03	11.20	1.59	0.60	6.05	16.50	2.12	1.00	2.88
6.00	0.31	0.00	0.06	11.30	1.61	0.61	5.93	16.60	2.12	1.00	2.86
6.10	0.32	0.00	0.09	11.40	1.62	0.62	5.81	16.70	2.13	1.01	2.84
6.20	0.33	0.00	0.13	11.50	1.64	0.63	5.68	16.80	2.14	1.01	2.83
6.30	0.33	0.00	0.16	11.60	1.65	0.64	5.56	16.90	2.14	1.02	2.81
6.40	0.34	0.00	0.21	11.70	1.67	0.65	5.43	17.00	2.15	1.02	2.79
6.50	0.35	0.00	0.25	11.80	1.68	0.67	5.30	17.10	2.16	1.03	2.77
6.60	0.36	0.00	0.30	11.90	1.70	0.68	5.17	17.20	2.16	1.04	2.75
6.70	0.36	0.00	0.35	12.00	1.71	0.69	5.03	17.30	2.17	1.04	2.74
6.80	0.37	0.00	0.40	12.10	1.72	0.70	4.95	17.40	2.18	1.05	2.72
6.90	0.38	0.00	0.46	12.20	1.74	0.70	4.87	17.50	2.18	1.05	2.70
7.00	0.39	0.01	0.52	12.30	1.75	0.71	4.79	17.60	2.19	1.06	2.68
7.10	0.40	0.01	0.58	12.40	1.76	0.72	4.71	17.70	2.20	1.06	2.66
7.20	0.41	0.01	0.63	12.50	1.77	0.73	4.63	17.80	2.20	1.07	2.64
7.30	0.42	0.01	0.68	12.60	1.78	0.74	4.54	17.90	2.21	1.07	2.63
7.40	0.43	0.01	0.74	12.70	1.80	0.75	4.46	18.00	2.21	1.08	2.61
7.50	0.44	0.01	0.79	12.80	1.81	0.76	4.37	18.10	2.22	1.08	2.59
7.60	0.45	0.01	0.85	12.90	1.82	0.77	4.28	18.20	2.23	1.09	2.57
7.70	0.46	0.01	0.90	13.00	1.83	0.77	4.20	18.30	2.23	1.09	2.55
7.80	0.47	0.02	0.96	13.10	1.84	0.78	4.11	18.40	2.24	1.10	2.53
7.90	0.48	0.02	1.01	13.20	1.85	0.79	4.02	18.50	2.25	1.10	2.51
8.00	0.48	0.02	1.08	13.30	1.86	0.80	3.93	18.60	2.25	1.11	2.49
8.10	0.50	0.02	1.24	13.40	1.87	0.81	3.84	18.70	2.26	1.11	2.48
8.20	0.51	0.03	1.42	13.50	1.88	0.81	3.75	18.80	2.26	1.12	2.46
8.30	0.52	0.03	1.62	13.60	1.89	0.82	3.66	18.90	2.27	1.12	2.44
8.40	0.53	0.03	1.83	13.70	1.90	0.83	3.56	19.00	2.27	1.13	2.42
8.50	0.55	0.04	2.07	13.80	1.91	0.83	3.47	19.10	2.28	1.13	2.40
8.60	0.56	0.04	2.30	13.90	1.92	0.84	3.38	19.20	2.29	1.13	2.38
8.70	0.58	0.04	2.56	14.00	1.92	0.85	3.29	19.30	2.29	1.14	2.36
8.80	0.60	0.05	2.83	14.10	1.93	0.85	3.27	19.40	2.30	1.14	2.34
8.90	0.62	0.06	3.12	14.20	1.94	0.86	3.25	19.50	2.30	1.15	2.32
9.00	0.63	0.06	3.44	14.30	1.95	0.87	3.24	19.60	2.31	1.15	2.30
9.10	0.66	0.07	3.91	14.40	1.96	0.87	3.22	19.70	2.31	1.16	2.28
9.20	0.68	0.08	4.43	14.50	1.97	0.88	3.21	19.80	2.32	1.16	2.26
9.30	0.70	0.09	4.99	14.60	1.97	0.89	3.19	19.90	2.32	1.17	2.24
9.40	0.73	0.10	5.59	14.70	1.98	0.89	3.18	20.00	**2.33**	**1.17**	2.22
9.50	0.76	0.11	6.53	14.80	1.99	0.90	3.16				
9.60	0.80	0.13	12.01	14.90	2.00	0.90	3.14				
9.70	0.86	0.15	18.81	15.00	2.00	0.91	3.13				
9.80	0.97	0.21	43.62	15.10	2.01	0.92	3.11				
9.90	1.16	0.31	**56.84**	15.20	2.02	0.92	3.10				
10.00	1.29	0.39	19.10	15.30	2.03	0.93	3.08				
10.10	1.33	0.42	13.67	15.40	2.04	0.93	3.06				
10.20	1.37	0.45	12.36	15.50	2.04	0.94	3.05				

Summary for Pond D2 exit: Free flow

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 0.90" for 2 yr event
Inflow = 53.26 cfs @ 10.15 hrs, Volume= 7.673 af
Primary = 53.26 cfs @ 10.15 hrs, Volume= 7.673 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D2 exit: Free flow



Hydrograph for Pond D2 exit: Free flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00	18.25	4.46		4.46
5.25	0.00		0.00	18.50	4.39		4.39
5.50	0.00		0.00	18.75	4.31		4.31
5.75	0.00		0.00	19.00	4.24		4.24
6.00	0.00		0.00	19.25	4.16		4.16
6.25	0.06		0.06	19.50	4.08		4.08
6.50	0.15		0.15	19.75	4.00		4.00
6.75	0.28		0.28	20.00	3.92		3.92
7.00	0.43		0.43				
7.25	0.61		0.61				
7.50	0.78		0.78				
7.75	0.95		0.95				
8.00	1.12		1.12				
8.25	1.33		1.33				
8.50	1.78		1.78				
8.75	2.42		2.42				
9.00	3.18		3.18				
9.25	4.12		4.12				
9.50	5.53		5.53				
9.75	9.06		9.06				
10.00	**35.00**		**35.00**				
10.25	**44.82**		**44.82**				
10.50	23.06		23.06				
10.75	15.21		15.21				
11.00	12.07		12.07				
11.25	10.56		10.56				
11.50	9.81		9.81				
11.75	9.32		9.32				
12.00	8.84		8.84				
12.25	8.36		8.36				
12.50	8.00		8.00				
12.75	7.68		7.68				
13.00	7.36		7.36				
13.25	7.02		7.02				
13.50	6.68		6.68				
13.75	6.32		6.32				
14.00	5.95		5.95				
14.25	5.61		5.61				
14.50	5.45		5.45				
14.75	5.38		5.38				
15.00	5.32		5.32				
15.25	5.26		5.26				
15.50	5.20		5.20				
15.75	5.14		5.14				
16.00	5.08		5.08				
16.25	5.02		5.02				
16.50	4.95		4.95				
16.75	4.89		4.89				
17.00	4.82		4.82				
17.25	4.75		4.75				
17.50	4.68		4.68				
17.75	4.61		4.61				
18.00	4.54		4.54				

Summary for Subcatchment D2-1: D2

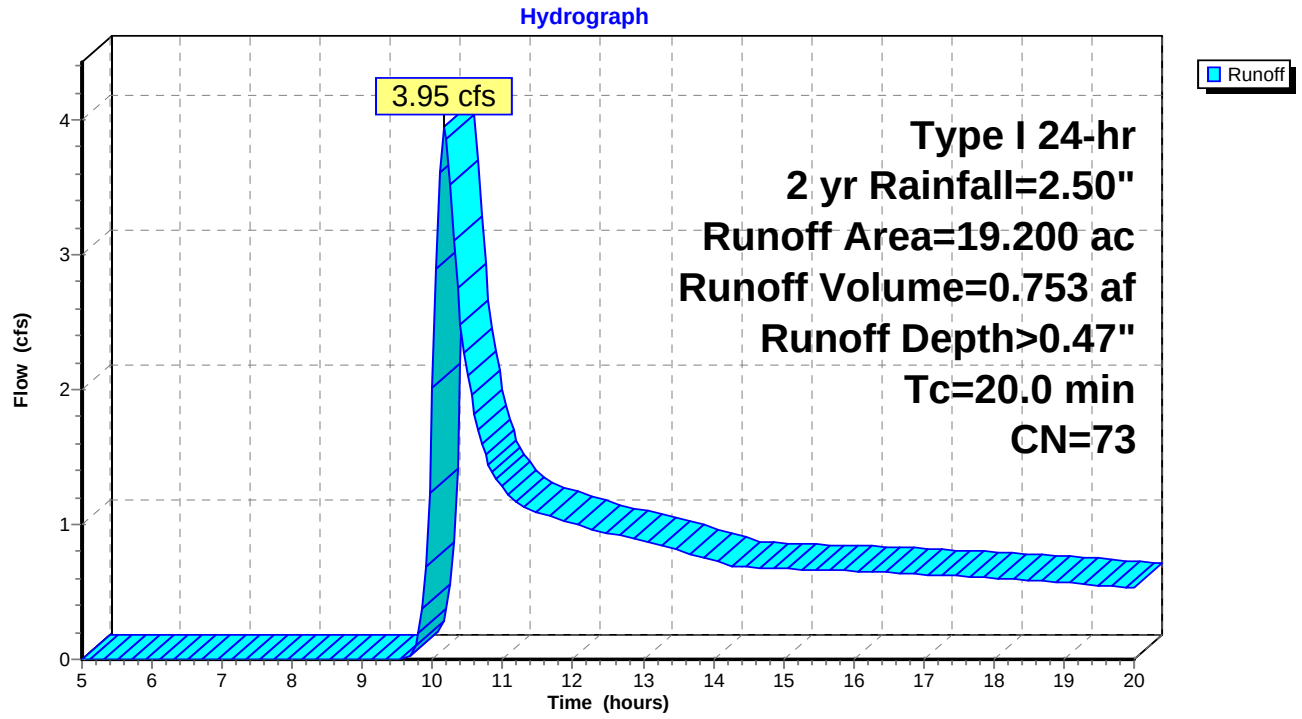
Runoff = 3.95 cfs @ 10.16 hrs, Volume= 0.753 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 2 yr Rainfall=2.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-1: D2



Hydrograph for Subcatchment D2-1: D2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00	10.30	1.40	0.10	3.11	15.60	2.05	0.34	0.66
5.10	0.26	0.00	0.00	10.40	1.43	0.11	2.48	15.70	2.06	0.35	0.66
5.20	0.26	0.00	0.00	10.50	1.46	0.12	2.10	15.80	2.07	0.35	0.66
5.30	0.27	0.00	0.00	10.60	1.48	0.12	1.82	15.90	2.07	0.35	0.66
5.40	0.27	0.00	0.00	10.70	1.50	0.13	1.60	16.00	2.08	0.36	0.65
5.50	0.28	0.00	0.00	10.80	1.52	0.14	1.44	16.10	2.09	0.36	0.65
5.60	0.29	0.00	0.00	10.90	1.54	0.14	1.34	16.20	2.09	0.36	0.65
5.70	0.29	0.00	0.00	11.00	1.56	0.15	1.27	16.30	2.10	0.37	0.65
5.80	0.30	0.00	0.00	11.10	1.57	0.15	1.21	16.40	2.11	0.37	0.65
5.90	0.31	0.00	0.00	11.20	1.59	0.16	1.16	16.50	2.12	0.37	0.64
6.00	0.31	0.00	0.00	11.30	1.61	0.16	1.13	16.60	2.12	0.38	0.64
6.10	0.32	0.00	0.00	11.40	1.62	0.17	1.10	16.70	2.13	0.38	0.64
6.20	0.33	0.00	0.00	11.50	1.64	0.18	1.09	16.80	2.14	0.38	0.64
6.30	0.33	0.00	0.00	11.60	1.65	0.18	1.07	16.90	2.14	0.39	0.63
6.40	0.34	0.00	0.00	11.70	1.67	0.19	1.06	17.00	2.15	0.39	0.63
6.50	0.35	0.00	0.00	11.80	1.68	0.19	1.04	17.10	2.16	0.39	0.63
6.60	0.36	0.00	0.00	11.90	1.70	0.20	1.03	17.20	2.16	0.40	0.62
6.70	0.36	0.00	0.00	12.00	1.71	0.20	1.01	17.30	2.17	0.40	0.62
6.80	0.37	0.00	0.00	12.10	1.72	0.21	0.99	17.40	2.18	0.40	0.62
6.90	0.38	0.00	0.00	12.20	1.74	0.21	0.98	17.50	2.18	0.41	0.62
7.00	0.39	0.00	0.00	12.30	1.75	0.22	0.96	17.60	2.19	0.41	0.61
7.10	0.40	0.00	0.00	12.40	1.76	0.22	0.95	17.70	2.20	0.41	0.61
7.20	0.41	0.00	0.00	12.50	1.77	0.23	0.94	17.80	2.20	0.41	0.61
7.30	0.42	0.00	0.00	12.60	1.78	0.23	0.93	17.90	2.21	0.42	0.60
7.40	0.43	0.00	0.00	12.70	1.80	0.23	0.92	18.00	2.21	0.42	0.60
7.50	0.44	0.00	0.00	12.80	1.81	0.24	0.90	18.10	2.22	0.42	0.60
7.60	0.45	0.00	0.00	12.90	1.82	0.24	0.89	18.20	2.23	0.43	0.60
7.70	0.46	0.00	0.00	13.00	1.83	0.25	0.88	18.30	2.23	0.43	0.59
7.80	0.47	0.00	0.00	13.10	1.84	0.25	0.87	18.40	2.24	0.43	0.59
7.90	0.48	0.00	0.00	13.20	1.85	0.26	0.85	18.50	2.25	0.44	0.59
8.00	0.48	0.00	0.00	13.30	1.86	0.26	0.84	18.60	2.25	0.44	0.58
8.10	0.50	0.00	0.00	13.40	1.87	0.26	0.83	18.70	2.26	0.44	0.58
8.20	0.51	0.00	0.00	13.50	1.88	0.27	0.81	18.80	2.26	0.44	0.58
8.30	0.52	0.00	0.00	13.60	1.89	0.27	0.80	18.90	2.27	0.45	0.57
8.40	0.53	0.00	0.00	13.70	1.90	0.28	0.78	19.00	2.27	0.45	0.57
8.50	0.55	0.00	0.00	13.80	1.91	0.28	0.77	19.10	2.28	0.45	0.56
8.60	0.56	0.00	0.00	13.90	1.92	0.28	0.75	19.20	2.29	0.46	0.56
8.70	0.58	0.00	0.00	14.00	1.92	0.29	0.73	19.30	2.29	0.46	0.56
8.80	0.60	0.00	0.00	14.10	1.93	0.29	0.72	19.40	2.30	0.46	0.55
8.90	0.62	0.00	0.00	14.20	1.94	0.29	0.70	19.50	2.30	0.46	0.55
9.00	0.63	0.00	0.00	14.30	1.95	0.30	0.69	19.60	2.31	0.47	0.55
9.10	0.66	0.00	0.00	14.40	1.96	0.30	0.68	19.70	2.31	0.47	0.54
9.20	0.68	0.00	0.00	14.50	1.97	0.31	0.68	19.80	2.32	0.47	0.54
9.30	0.70	0.00	0.00	14.60	1.97	0.31	0.68	19.90	2.32	0.48	0.54
9.40	0.73	0.00	0.00	14.70	1.98	0.31	0.68	20.00	**2.33**	**0.48**	0.53
9.50	0.76	0.00	0.00	14.80	1.99	0.32	0.68				
9.60	0.80	0.00	0.01	14.90	2.00	0.32	0.67				
9.70	0.86	0.00	0.05	15.00	2.00	0.32	0.67				
9.80	0.97	0.01	0.20	15.10	2.01	0.33	0.67				
9.90	1.16	0.04	0.69	15.20	2.02	0.33	0.67				
10.00	1.29	0.07	2.01	15.30	2.03	0.33	0.67				
10.10	1.33	0.08	**3.61**	15.40	2.04	0.34	0.67				
10.20	1.37	0.09	**3.85**	15.50	2.04	0.34	0.66				

Summary for Subcatchment D2-2: D2

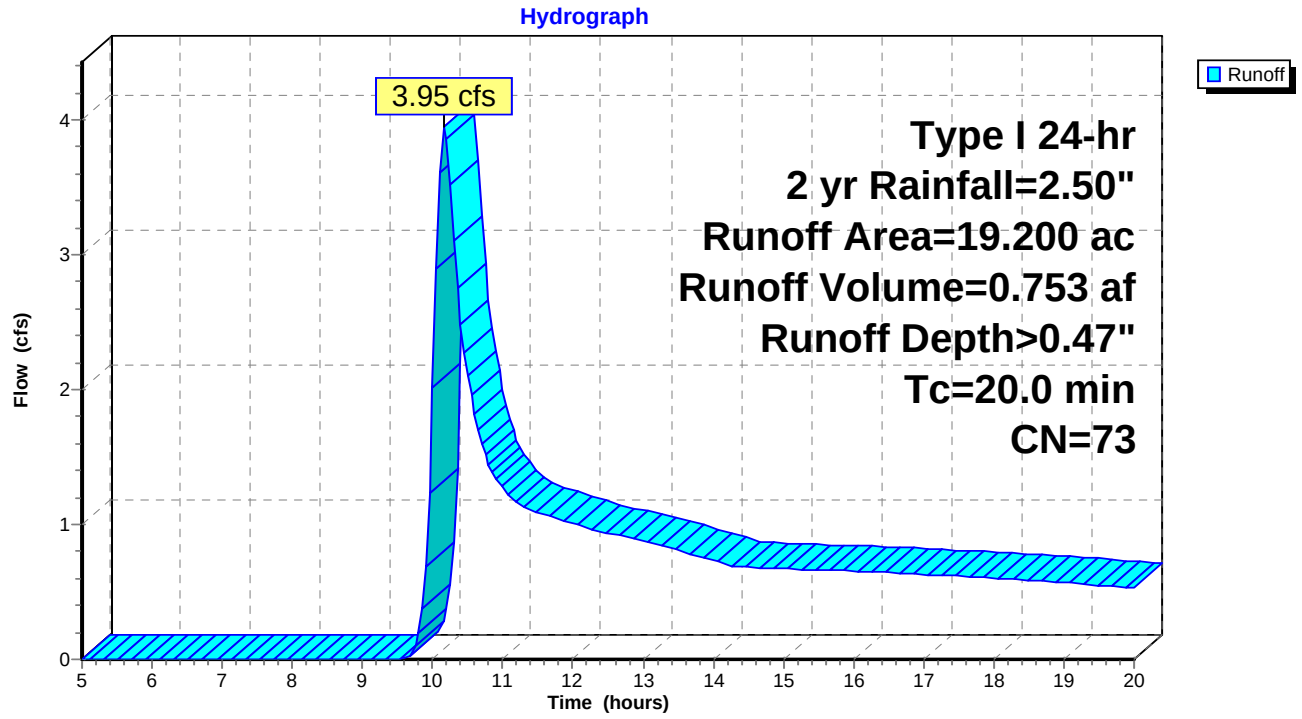
Runoff = 3.95 cfs @ 10.16 hrs, Volume= 0.753 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 2 yr Rainfall=2.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-2: D2



Hydrograph for Subcatchment D2-2: D2

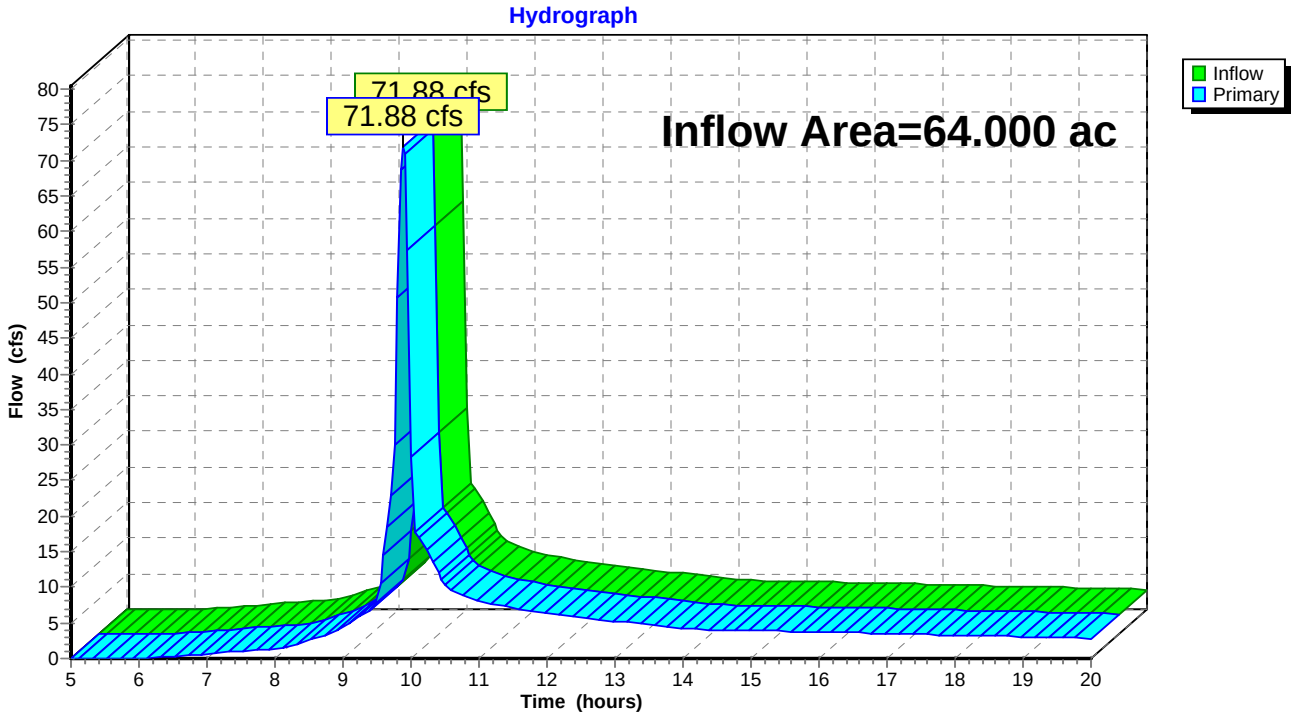
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00	10.30	1.40	0.10	3.11	15.60	2.05	0.34	0.66
5.10	0.26	0.00	0.00	10.40	1.43	0.11	2.48	15.70	2.06	0.35	0.66
5.20	0.26	0.00	0.00	10.50	1.46	0.12	2.10	15.80	2.07	0.35	0.66
5.30	0.27	0.00	0.00	10.60	1.48	0.12	1.82	15.90	2.07	0.35	0.66
5.40	0.27	0.00	0.00	10.70	1.50	0.13	1.60	16.00	2.08	0.36	0.65
5.50	0.28	0.00	0.00	10.80	1.52	0.14	1.44	16.10	2.09	0.36	0.65
5.60	0.29	0.00	0.00	10.90	1.54	0.14	1.34	16.20	2.09	0.36	0.65
5.70	0.29	0.00	0.00	11.00	1.56	0.15	1.27	16.30	2.10	0.37	0.65
5.80	0.30	0.00	0.00	11.10	1.57	0.15	1.21	16.40	2.11	0.37	0.65
5.90	0.31	0.00	0.00	11.20	1.59	0.16	1.16	16.50	2.12	0.37	0.64
6.00	0.31	0.00	0.00	11.30	1.61	0.16	1.13	16.60	2.12	0.38	0.64
6.10	0.32	0.00	0.00	11.40	1.62	0.17	1.10	16.70	2.13	0.38	0.64
6.20	0.33	0.00	0.00	11.50	1.64	0.18	1.09	16.80	2.14	0.38	0.64
6.30	0.33	0.00	0.00	11.60	1.65	0.18	1.07	16.90	2.14	0.39	0.63
6.40	0.34	0.00	0.00	11.70	1.67	0.19	1.06	17.00	2.15	0.39	0.63
6.50	0.35	0.00	0.00	11.80	1.68	0.19	1.04	17.10	2.16	0.39	0.63
6.60	0.36	0.00	0.00	11.90	1.70	0.20	1.03	17.20	2.16	0.40	0.62
6.70	0.36	0.00	0.00	12.00	1.71	0.20	1.01	17.30	2.17	0.40	0.62
6.80	0.37	0.00	0.00	12.10	1.72	0.21	0.99	17.40	2.18	0.40	0.62
6.90	0.38	0.00	0.00	12.20	1.74	0.21	0.98	17.50	2.18	0.41	0.62
7.00	0.39	0.00	0.00	12.30	1.75	0.22	0.96	17.60	2.19	0.41	0.61
7.10	0.40	0.00	0.00	12.40	1.76	0.22	0.95	17.70	2.20	0.41	0.61
7.20	0.41	0.00	0.00	12.50	1.77	0.23	0.94	17.80	2.20	0.41	0.61
7.30	0.42	0.00	0.00	12.60	1.78	0.23	0.93	17.90	2.21	0.42	0.60
7.40	0.43	0.00	0.00	12.70	1.80	0.23	0.92	18.00	2.21	0.42	0.60
7.50	0.44	0.00	0.00	12.80	1.81	0.24	0.90	18.10	2.22	0.42	0.60
7.60	0.45	0.00	0.00	12.90	1.82	0.24	0.89	18.20	2.23	0.43	0.60
7.70	0.46	0.00	0.00	13.00	1.83	0.25	0.88	18.30	2.23	0.43	0.59
7.80	0.47	0.00	0.00	13.10	1.84	0.25	0.87	18.40	2.24	0.43	0.59
7.90	0.48	0.00	0.00	13.20	1.85	0.26	0.85	18.50	2.25	0.44	0.59
8.00	0.48	0.00	0.00	13.30	1.86	0.26	0.84	18.60	2.25	0.44	0.58
8.10	0.50	0.00	0.00	13.40	1.87	0.26	0.83	18.70	2.26	0.44	0.58
8.20	0.51	0.00	0.00	13.50	1.88	0.27	0.81	18.80	2.26	0.44	0.58
8.30	0.52	0.00	0.00	13.60	1.89	0.27	0.80	18.90	2.27	0.45	0.57
8.40	0.53	0.00	0.00	13.70	1.90	0.28	0.78	19.00	2.27	0.45	0.57
8.50	0.55	0.00	0.00	13.80	1.91	0.28	0.77	19.10	2.28	0.45	0.56
8.60	0.56	0.00	0.00	13.90	1.92	0.28	0.75	19.20	2.29	0.46	0.56
8.70	0.58	0.00	0.00	14.00	1.92	0.29	0.73	19.30	2.29	0.46	0.56
8.80	0.60	0.00	0.00	14.10	1.93	0.29	0.72	19.40	2.30	0.46	0.55
8.90	0.62	0.00	0.00	14.20	1.94	0.29	0.70	19.50	2.30	0.46	0.55
9.00	0.63	0.00	0.00	14.30	1.95	0.30	0.69	19.60	2.31	0.47	0.55
9.10	0.66	0.00	0.00	14.40	1.96	0.30	0.68	19.70	2.31	0.47	0.54
9.20	0.68	0.00	0.00	14.50	1.97	0.31	0.68	19.80	2.32	0.47	0.54
9.30	0.70	0.00	0.00	14.60	1.97	0.31	0.68	19.90	2.32	0.48	0.54
9.40	0.73	0.00	0.00	14.70	1.98	0.31	0.68	20.00	**2.33**	**0.48**	0.53
9.50	0.76	0.00	0.00	14.80	1.99	0.32	0.68				
9.60	0.80	0.00	0.01	14.90	2.00	0.32	0.67				
9.70	0.86	0.00	0.05	15.00	2.00	0.32	0.67				
9.80	0.97	0.01	0.20	15.10	2.01	0.33	0.67				
9.90	1.16	0.04	0.69	15.20	2.02	0.33	0.67				
10.00	1.29	0.07	2.01	15.30	2.03	0.33	0.67				
10.10	1.33	0.08	**3.61**	15.40	2.04	0.34	0.67				
10.20	1.37	0.09	**3.85**	15.50	2.04	0.34	0.66				

Summary for Pond D3 exit: Free Flow

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 1.17" for 2 yr event
Inflow = 71.88 cfs @ 9.88 hrs, Volume= 6.244 af
Primary = 71.88 cfs @ 9.88 hrs, Volume= 6.244 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D3 exit: Free Flow



Hydrograph for Pond D3 exit: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00	18.25	3.20		3.20
5.25	0.00		0.00	18.50	3.14		3.14
5.50	0.00		0.00	18.75	3.09		3.09
5.75	0.00		0.00	19.00	3.03		3.03
6.00	0.07		0.07	19.25	2.97		2.97
6.25	0.17		0.17	19.50	2.90		2.90
6.50	0.30		0.30	19.75	2.84		2.84
6.75	0.46		0.46	20.00	2.78		2.78
7.00	0.64		0.64				
7.25	0.81		0.81				
7.50	0.98		0.98				
7.75	1.15		1.15				
8.00	1.33		1.33				
8.25	1.87		1.87				
8.50	2.55		2.55				
8.75	3.33		3.33				
9.00	4.25		4.25				
9.25	5.82		5.82				
9.50	7.99		7.99				
9.75	**30.03**		**30.03**				
10.00	**28.41**		**28.41**				
10.25	14.51		14.51				
10.50	10.29		10.29				
10.75	9.02		9.02				
11.00	7.90		7.90				
11.25	7.51		7.51				
11.50	7.11		7.11				
11.75	6.72		6.72				
12.00	6.31		6.31				
12.25	6.05		6.05				
12.50	5.79		5.79				
12.75	5.53		5.53				
13.00	5.26		5.26				
13.25	4.98		4.98				
13.50	4.70		4.70				
13.75	4.41		4.41				
14.00	4.12		4.12				
14.25	4.06		4.06				
14.50	4.01		4.01				
14.75	3.96		3.96				
15.00	3.91		3.91				
15.25	3.86		3.86				
15.50	3.81		3.81				
15.75	3.76		3.76				
16.00	3.71		3.71				
16.25	3.65		3.65				
16.50	3.60		3.60				
16.75	3.54		3.54				
17.00	3.49		3.49				
17.25	3.43		3.43				
17.50	3.38		3.38				
17.75	3.32		3.32				
18.00	3.26		3.26				

Summary for Subcatchment D3-2: D3

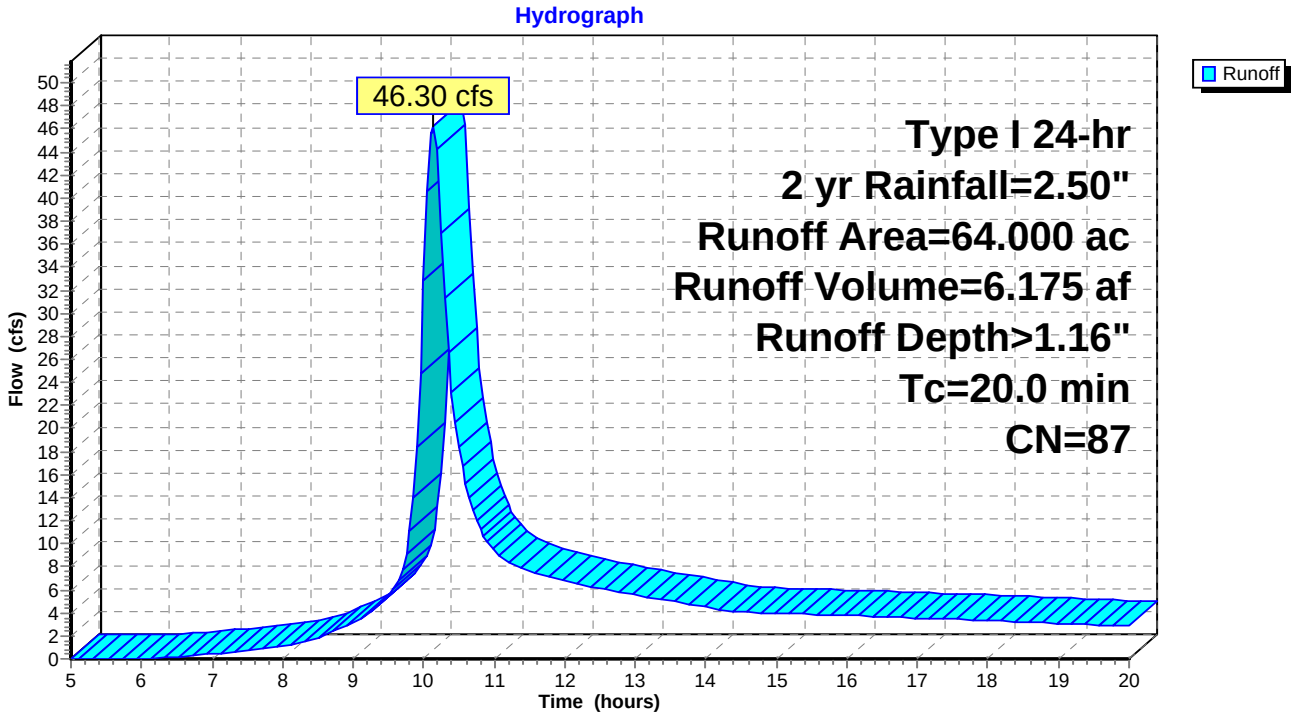
Runoff = 46.30 cfs @ 10.13 hrs, Volume= 6.175 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 2 yr Rainfall=2.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D3-2: D3



Hydrograph for Subcatchment D3-2: D3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.25	0.00	0.00	10.30	1.40	0.47	31.31	15.60	2.05	0.95	3.85
5.10	0.26	0.00	0.00	10.40	1.43	0.49	23.15	15.70	2.06	0.95	3.83
5.20	0.26	0.00	0.00	10.50	1.46	0.51	18.41	15.80	2.07	0.96	3.81
5.30	0.27	0.00	0.00	10.60	1.48	0.52	15.20	15.90	2.07	0.96	3.79
5.40	0.27	0.00	0.00	10.70	1.50	0.54	12.85	16.00	2.08	0.97	3.77
5.50	0.28	0.00	0.00	10.80	1.52	0.55	11.24	16.10	2.09	0.97	3.75
5.60	0.29	0.00	0.00	10.90	1.54	0.56	10.19	16.20	2.09	0.98	3.73
5.70	0.29	0.00	0.00	11.00	1.56	0.58	9.44	16.30	2.10	0.99	3.71
5.80	0.30	0.00	0.00	11.10	1.57	0.59	8.87	16.40	2.11	0.99	3.69
5.90	0.31	0.00	0.00	11.20	1.59	0.60	8.41	16.50	2.12	1.00	3.66
6.00	0.31	0.00	0.01	11.30	1.61	0.61	8.06	16.60	2.12	1.00	3.64
6.10	0.32	0.00	0.02	11.40	1.62	0.62	7.81	16.70	2.13	1.01	3.62
6.20	0.33	0.00	0.05	11.50	1.64	0.63	7.62	16.80	2.14	1.01	3.60
6.30	0.33	0.00	0.08	11.60	1.65	0.64	7.44	16.90	2.14	1.02	3.58
6.40	0.34	0.00	0.12	11.70	1.67	0.65	7.28	17.00	2.15	1.02	3.56
6.50	0.35	0.00	0.16	11.80	1.68	0.67	7.12	17.10	2.16	1.03	3.53
6.60	0.36	0.00	0.21	11.90	1.70	0.68	6.96	17.20	2.16	1.04	3.51
6.70	0.36	0.00	0.26	12.00	1.71	0.69	6.80	17.30	2.17	1.04	3.49
6.80	0.37	0.00	0.31	12.10	1.72	0.70	6.64	17.40	2.18	1.05	3.47
6.90	0.38	0.00	0.37	12.20	1.74	0.70	6.48	17.50	2.18	1.05	3.44
7.00	0.39	0.01	0.44	12.30	1.75	0.71	6.34	17.60	2.19	1.06	3.42
7.10	0.40	0.01	0.50	12.40	1.76	0.72	6.22	17.70	2.20	1.06	3.40
7.20	0.41	0.01	0.57	12.50	1.77	0.73	6.11	17.80	2.20	1.07	3.38
7.30	0.42	0.01	0.65	12.60	1.78	0.74	6.00	17.90	2.21	1.07	3.35
7.40	0.43	0.01	0.71	12.70	1.80	0.75	5.90	18.00	2.21	1.08	3.33
7.50	0.44	0.01	0.78	12.80	1.81	0.76	5.79	18.10	2.22	1.08	3.31
7.60	0.45	0.01	0.85	12.90	1.82	0.77	5.69	18.20	2.23	1.09	3.28
7.70	0.46	0.01	0.92	13.00	1.83	0.77	5.58	18.30	2.23	1.09	3.26
7.80	0.47	0.02	0.98	13.10	1.84	0.78	5.47	18.40	2.24	1.10	3.24
7.90	0.48	0.02	1.05	13.20	1.85	0.79	5.36	18.50	2.25	1.10	3.21
8.00	0.48	0.02	1.12	13.30	1.86	0.80	5.25	18.60	2.25	1.11	3.19
8.10	0.50	0.02	1.19	13.40	1.87	0.81	5.14	18.70	2.26	1.11	3.17
8.20	0.51	0.03	1.28	13.50	1.88	0.81	5.03	18.80	2.26	1.12	3.14
8.30	0.52	0.03	1.40	13.60	1.89	0.82	4.92	18.90	2.27	1.12	3.12
8.40	0.53	0.03	1.58	13.70	1.90	0.83	4.81	19.00	2.27	1.13	3.10
8.50	0.55	0.04	1.79	13.80	1.91	0.83	4.69	19.10	2.28	1.13	3.07
8.60	0.56	0.04	2.03	13.90	1.92	0.84	4.58	19.20	2.29	1.13	3.05
8.70	0.58	0.04	2.29	14.00	1.92	0.85	4.46	19.30	2.29	1.14	3.02
8.80	0.60	0.05	2.57	14.10	1.93	0.85	4.35	19.40	2.30	1.14	3.00
8.90	0.62	0.06	2.87	14.20	1.94	0.86	4.24	19.50	2.30	1.15	2.98
9.00	0.63	0.06	3.19	14.30	1.95	0.87	4.16	19.60	2.31	1.15	2.95
9.10	0.66	0.07	3.53	14.40	1.96	0.87	4.11	19.70	2.31	1.16	2.93
9.20	0.68	0.08	3.91	14.50	1.97	0.88	4.08	19.80	2.32	1.16	2.90
9.30	0.70	0.09	4.38	14.60	1.97	0.89	4.05	19.90	2.32	1.17	2.88
9.40	0.73	0.10	4.93	14.70	1.98	0.89	4.03	20.00	**2.33**	**1.17**	2.86
9.50	0.76	0.11	5.55	14.80	1.99	0.90	4.01				
9.60	0.80	0.13	6.28	14.90	2.00	0.90	3.99				
9.70	0.86	0.15	7.71	15.00	2.00	0.91	3.97				
9.80	0.97	0.21	11.14	15.10	2.01	0.92	3.95				
9.90	1.16	0.31	18.43	15.20	2.02	0.92	3.93				
10.00	1.29	0.39	32.88	15.30	2.03	0.93	3.91				
10.10	1.33	0.42	**45.55**	15.40	2.04	0.93	3.89				
10.20	1.37	0.45	**42.46**	15.50	2.04	0.94	3.87				

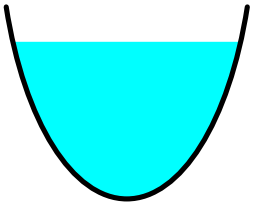
Summary for Reach 3R: D-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 2.80" for 5 yr event
Inflow = 175.86 cfs @ 9.87 hrs, Volume= 14.951 af
Outflow = 175.34 cfs @ 9.87 hrs, Volume= 14.947 af, Atten= 0%, Lag= 0.1 min

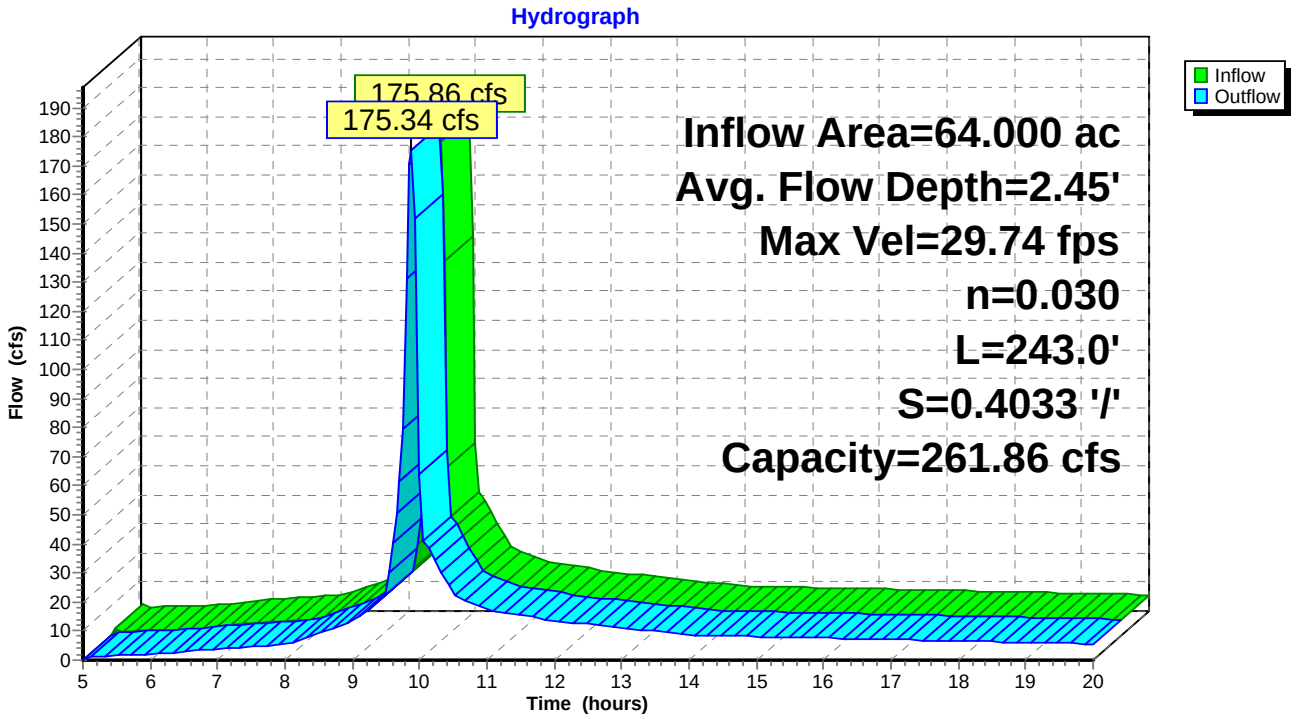
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 29.74 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 14.02 fps, Avg. Travel Time= 0.3 min

Peak Storage= 1,435 cf @ 9.87 hrs
Average Depth at Peak Storage= 2.45' , Surface Width= 3.62'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 261.86 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 243.0' Slope= 0.4033 '/'
Inlet Invert= 727.00', Outlet Invert= 629.00'



Reach 3R: D-3



Hydrograph for Reach 3R: D-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	727.00	0.00
5.25	1.87	38	727.22	1.31
5.50	1.50	48	727.25	1.74
5.75	1.92	49	727.26	1.81
6.00	2.04	54	727.27	2.08
6.25	2.49	61	727.30	2.45
6.50	2.93	69	727.32	2.93
6.75	3.45	77	727.35	3.43
7.00	4.00	86	727.38	3.99
7.25	4.38	92	727.39	4.37
7.50	4.75	97	727.41	4.74
7.75	5.12	103	727.42	5.11
8.00	5.53	109	727.44	5.51
8.25	7.28	132	727.50	7.23
8.50	9.28	158	727.56	9.23
8.75	11.38	183	727.62	11.33
9.00	13.69	210	727.68	13.63
9.25	17.73	254	727.77	17.64
9.50	23.23	309	727.88	23.00
9.75	**81.47**	**787**	**728.64**	**79.54**
10.00	**57.65**	**636**	**728.42**	**63.75**
10.25	32.77	400	728.05	32.74
10.50	22.88	308	727.88	22.99
10.75	19.73	277	727.82	19.91
11.00	17.39	250	727.76	17.33
11.25	16.29	240	727.74	16.39
11.50	15.45	230	727.72	15.42
11.75	14.46	220	727.70	14.51
12.00	13.54	209	727.68	13.54
12.25	12.92	202	727.66	12.94
12.50	12.33	195	727.65	12.34
12.75	11.72	188	727.63	11.74
13.00	11.11	181	727.62	11.12
13.25	10.49	173	727.60	10.51
13.50	9.87	166	727.58	9.88
13.75	9.24	158	727.56	9.25
14.00	8.62	150	727.54	8.63
14.25	8.48	148	727.54	8.49
14.50	8.37	147	727.54	8.37
14.75	8.25	145	727.53	8.25
15.00	8.13	144	727.53	8.14
15.25	8.01	142	727.52	8.02
15.50	7.89	141	727.52	7.90
15.75	7.77	139	727.52	7.78
16.00	7.65	138	727.51	7.65
16.25	7.53	136	727.51	7.53
16.50	7.41	134	727.51	7.41
16.75	7.28	133	727.50	7.29
17.00	7.16	131	727.50	7.16
17.25	7.04	129	727.49	7.04
17.50	6.91	128	727.49	6.91
17.75	6.78	126	727.48	6.79
18.00	6.66	124	727.48	6.66
18.25	6.53	123	727.48	6.53
18.50	6.40	121	727.47	6.41
18.75	6.28	119	727.47	6.28
19.00	6.15	117	727.46	6.15
19.25	6.02	116	727.46	6.02
19.50	5.89	114	727.45	5.89
19.75	5.76	112	727.45	5.76
20.00	5.63	110	727.44	5.63

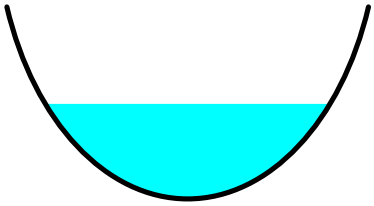
Summary for Reach C-1: D-2

Inflow Area = 38.400 ac, 0.00% Impervious, Inflow Depth > 1.65" for 5 yr event
Inflow = 37.77 cfs @ 10.14 hrs, Volume= 5.274 af
Outflow = 37.37 cfs @ 10.16 hrs, Volume= 5.264 af, Atten= 1%, Lag= 1.5 min

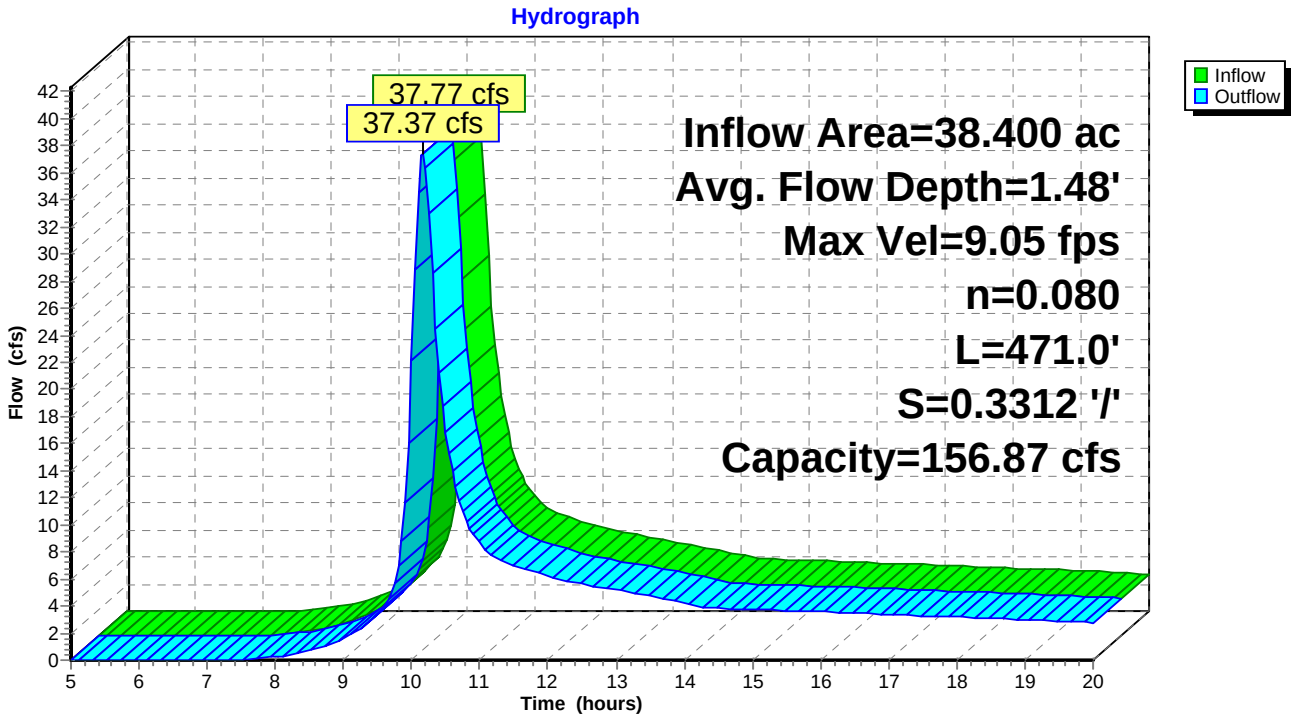
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.05 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 4.73 fps, Avg. Travel Time= 1.7 min

Peak Storage= 1,964 cf @ 10.15 hrs
Average Depth at Peak Storage= 1.48' , Surface Width= 4.22'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 156.87 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 471.0' Slope= 0.3312 '/'
Inlet Invert= 1,641.00', Outlet Invert= 1,485.00'



Reach C-1: D-2



Hydrograph for Reach C-1: D-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	1,641.00	0.00
5.25	0.00	0	1,641.00	0.00
5.50	0.00	0	1,641.00	0.00
5.75	0.00	0	1,641.00	0.00
6.00	0.00	0	1,641.00	0.00
6.25	0.00	0	1,641.00	0.00
6.50	0.00	0	1,641.00	0.00
6.75	0.00	0	1,641.00	0.00
7.00	0.00	0	1,641.00	0.00
7.25	0.00	0	1,641.00	0.00
7.50	0.02	4	1,641.02	0.00
7.75	0.13	29	1,641.09	0.09
8.00	0.28	55	1,641.14	0.24
8.25	0.45	79	1,641.17	0.41
8.50	0.74	113	1,641.22	0.68
8.75	1.17	158	1,641.28	1.09
9.00	1.73	210	1,641.33	1.64
9.25	2.47	270	1,641.39	2.34
9.50	3.59	353	1,641.47	3.41
9.75	6.36	517	1,641.61	5.69
10.00	**25.69**	**1,409**	**1,642.19**	**22.08**
10.25	**30.79**	**1,733**	**1,642.36**	**32.97**
10.50	15.87	1,066	1,641.99	16.81
10.75	10.53	789	1,641.81	10.97
11.00	8.42	667	1,641.72	8.60
11.25	7.39	606	1,641.68	7.49
11.50	6.88	575	1,641.65	6.93
11.75	6.54	554	1,641.64	6.58
12.00	6.20	534	1,641.62	6.25
12.25	5.87	513	1,641.61	5.91
12.50	5.62	497	1,641.59	5.65
12.75	5.39	482	1,641.58	5.42
13.00	5.16	468	1,641.57	5.19
13.25	4.93	452	1,641.56	4.96
13.50	4.68	436	1,641.54	4.71
13.75	4.43	420	1,641.53	4.46
14.00	4.17	402	1,641.52	4.21
14.25	3.93	385	1,641.50	3.96
14.50	3.83	377	1,641.49	3.84
14.75	3.78	374	1,641.49	3.79
15.00	3.74	371	1,641.49	3.74
15.25	3.70	368	1,641.49	3.70
15.50	3.66	365	1,641.48	3.66
15.75	3.61	362	1,641.48	3.62
16.00	3.57	359	1,641.48	3.58
16.25	3.52	356	1,641.47	3.53
16.50	3.48	353	1,641.47	3.49
16.75	3.43	349	1,641.47	3.44
17.00	3.38	346	1,641.47	3.39
17.25	3.34	342	1,641.46	3.34
17.50	3.29	339	1,641.46	3.29
17.75	3.24	335	1,641.46	3.24
18.00	3.19	331	1,641.45	3.19
18.25	3.13	328	1,641.45	3.14
18.50	3.08	324	1,641.45	3.09
18.75	3.03	320	1,641.44	3.03
19.00	2.97	315	1,641.44	2.98
19.25	2.92	311	1,641.43	2.93
19.50	2.86	307	1,641.43	2.87
19.75	2.81	303	1,641.43	2.82
20.00	2.75	299	1,641.42	2.76

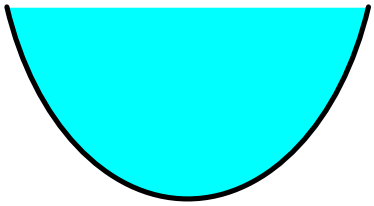
Summary for Reach C-2: D-2

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 2.36" for 5 yr event
Inflow = 150.54 cfs @ 10.13 hrs, Volume= 20.100 af
Outflow = 150.39 cfs @ 10.14 hrs, Volume= 20.095 af, Atten= 0%, Lag= 0.1 min

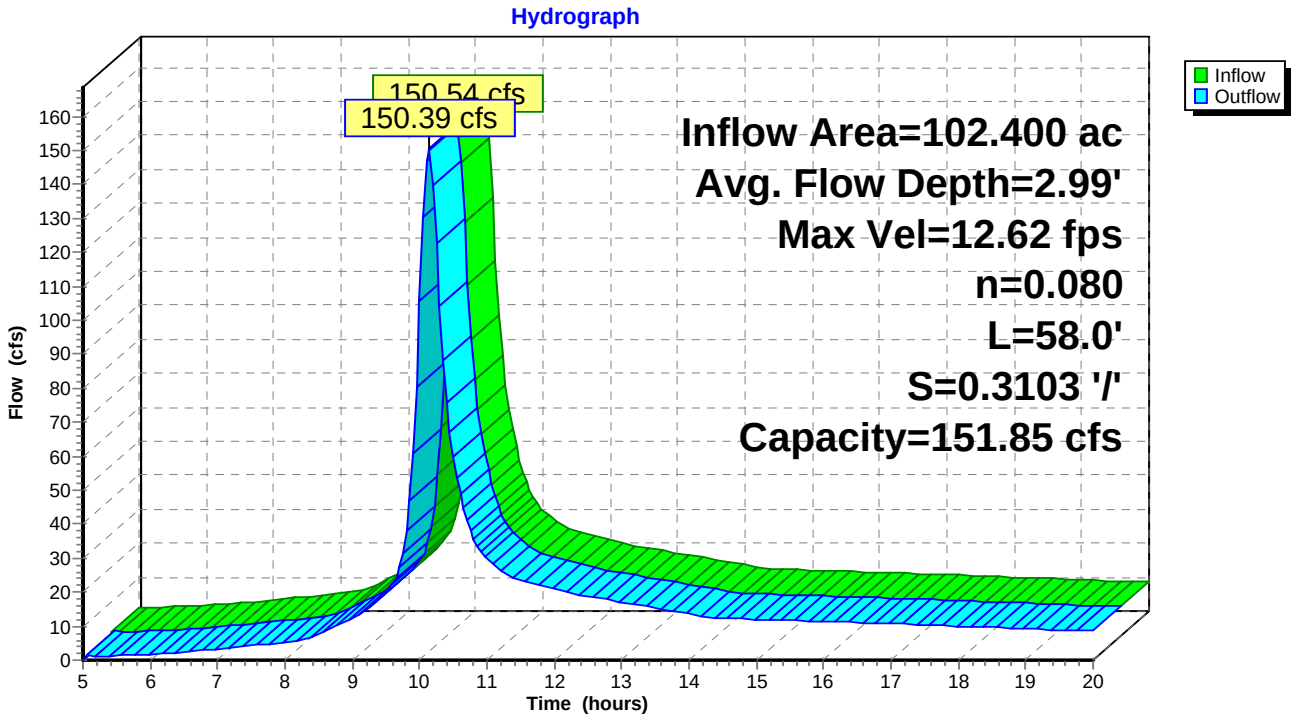
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.62 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 6.39 fps, Avg. Travel Time= 0.2 min

Peak Storage= 692 cf @ 10.14 hrs
Average Depth at Peak Storage= 2.99' , Surface Width= 5.99'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 151.85 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 58.0' Slope= 0.3103 '/'
Inlet Invert= 619.00', Outlet Invert= 601.00'



Reach C-2: D-2



Hydrograph for Reach C-2: D-2

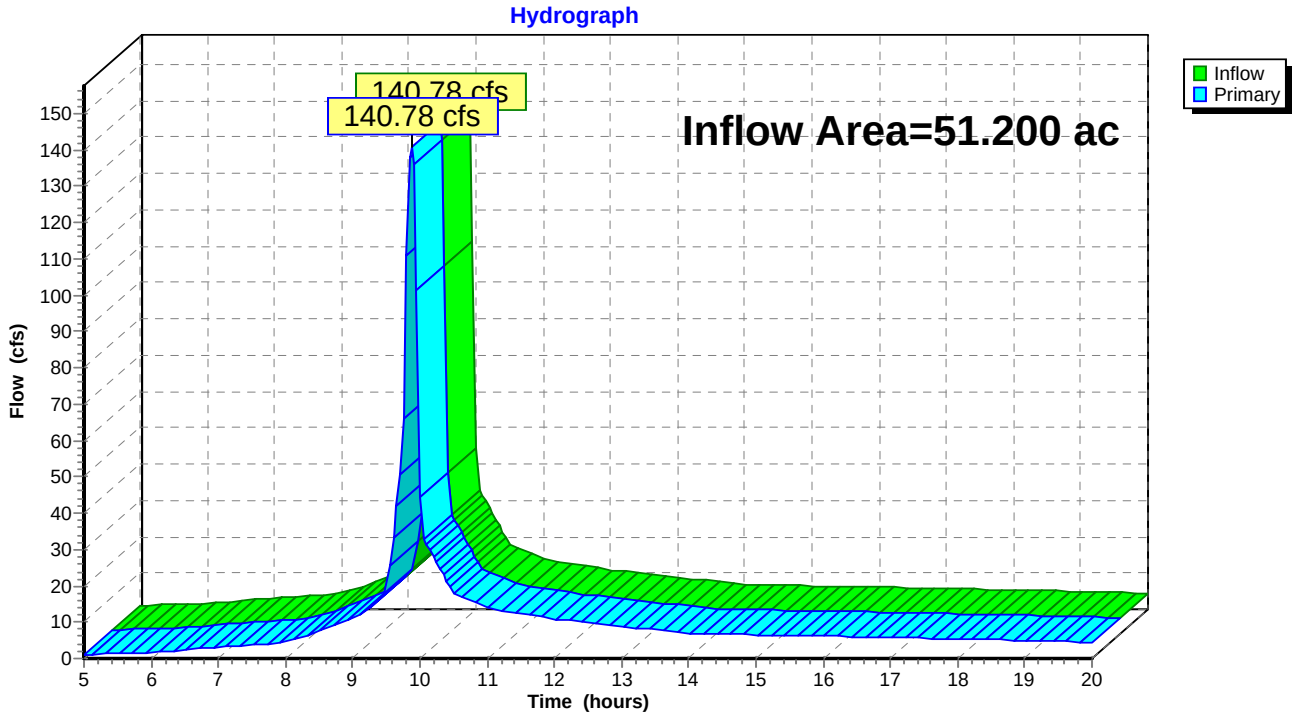
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.98	0	619.00	0.00
5.25	1.20	23	619.31	1.40
5.50	1.40	23	619.31	1.35
5.75	1.61	26	619.33	1.62
6.00	1.82	28	619.35	1.81
6.25	2.04	30	619.37	2.03
6.50	2.39	34	619.40	2.39
6.75	2.84	38	619.43	2.83
7.00	3.34	43	619.47	3.33
7.25	3.86	48	619.50	3.86
7.50	4.29	52	619.53	4.29
7.75	4.76	55	619.56	4.75
8.00	5.28	60	619.58	5.28
8.25	5.97	65	619.62	5.95
8.50	7.63	78	619.70	7.60
8.75	9.93	94	619.79	9.90
9.00	12.55	111	619.88	12.51
9.25	15.67	130	619.98	15.62
9.50	20.32	157	620.11	20.26
9.75	31.75	217	620.38	31.49
10.00	**106.69**	**532**	**621.51**	**105.49**
10.25	**121.67**	**591**	**621.69**	**122.51**
10.50	59.36	346	620.88	59.70
10.75	37.93	249	620.51	38.07
11.00	29.56	207	620.34	29.62
11.25	25.59	186	620.25	25.62
11.50	23.57	176	620.20	23.59
11.75	22.22	168	620.16	22.24
12.00	20.94	161	620.13	20.95
12.25	19.68	154	620.10	19.70
12.50	18.72	149	620.07	18.73
12.75	17.89	144	620.05	17.90
13.00	17.05	139	620.02	17.06
13.25	16.21	134	620.00	16.22
13.50	15.35	129	619.97	15.36
13.75	14.47	123	619.95	14.48
14.00	13.59	118	619.92	13.60
14.25	12.76	113	619.89	12.77
14.50	12.37	110	619.88	12.38
14.75	12.18	109	619.87	12.19
15.00	12.02	108	619.87	12.02
15.25	11.86	107	619.86	11.87
15.50	11.70	106	619.85	11.70
15.75	11.54	105	619.85	11.54
16.00	11.38	104	619.84	11.38
16.25	11.21	103	619.84	11.21
16.50	11.04	101	619.83	11.05
16.75	10.87	100	619.82	10.88
17.00	10.70	99	619.82	10.70
17.25	10.53	98	619.81	10.53
17.50	10.36	97	619.81	10.36
17.75	10.18	96	619.80	10.18
18.00	10.01	94	619.79	10.01
18.25	9.83	93	619.79	9.83
18.50	9.65	92	619.78	9.65
18.75	9.47	91	619.77	9.47
19.00	9.28	90	619.76	9.29
19.25	9.10	88	619.76	9.11
19.50	8.92	87	619.75	8.92
19.75	8.73	86	619.74	8.74
20.00	8.55	84	619.73	8.55

Summary for Pond D-1 Arroyo Trabuco: Free Flow

Inflow Area = 51.200 ac, 38.00% Impervious, Inflow Depth > 2.80" for 5 yr event
Inflow = 140.78 cfs @ 9.87 hrs, Volume= 11.964 af
Primary = 140.78 cfs @ 9.87 hrs, Volume= 11.964 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D-1 Arroyo Trabuco: Free Flow



Hydrograph for Pond D-1 Arroyo Trabuco: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	1.00		1.00	18.25	5.22		5.22
5.25	1.16		1.16	18.50	5.12		5.12
5.50	1.33		1.33	18.75	5.02		5.02
5.75	1.49		1.49	19.00	4.92		4.92
6.00	1.65		1.65	19.25	4.81		4.81
6.25	1.98		1.98	19.50	4.71		4.71
6.50	2.36		2.36	19.75	4.61		4.61
6.75	2.77		2.77	20.00	4.50		4.50
7.00	3.21		3.21				
7.25	3.51		3.51				
7.50	3.81		3.81				
7.75	4.10		4.10				
8.00	4.43		4.43				
8.25	5.84		5.84				
8.50	7.44		7.44				
8.75	9.12		9.12				
9.00	10.97		10.97				
9.25	14.22		14.22				
9.50	18.67		18.67				
9.75	**65.90**		**65.90**				
10.00	**44.18**		**44.18**				
10.25	26.42		26.42				
10.50	18.07		18.07				
10.75	15.88		15.88				
11.00	13.83		13.83				
11.25	13.07		13.07				
11.50	12.33		12.33				
11.75	11.58		11.58				
12.00	10.82		10.82				
12.25	10.34		10.34				
12.50	9.86		9.86				
12.75	9.37		9.37				
13.00	8.88		8.88				
13.25	8.39		8.39				
13.50	7.89		7.89				
13.75	7.39		7.39				
14.00	6.89		6.89				
14.25	6.79		6.79				
14.50	6.69		6.69				
14.75	6.60		6.60				
15.00	6.51		6.51				
15.25	6.41		6.41				
15.50	6.31		6.31				
15.75	6.22		6.22				
16.00	6.12		6.12				
16.25	6.02		6.02				
16.50	5.92		5.92				
16.75	5.83		5.83				
17.00	5.73		5.73				
17.25	5.63		5.63				
17.50	5.53		5.53				
17.75	5.43		5.43				
18.00	5.33		5.33				

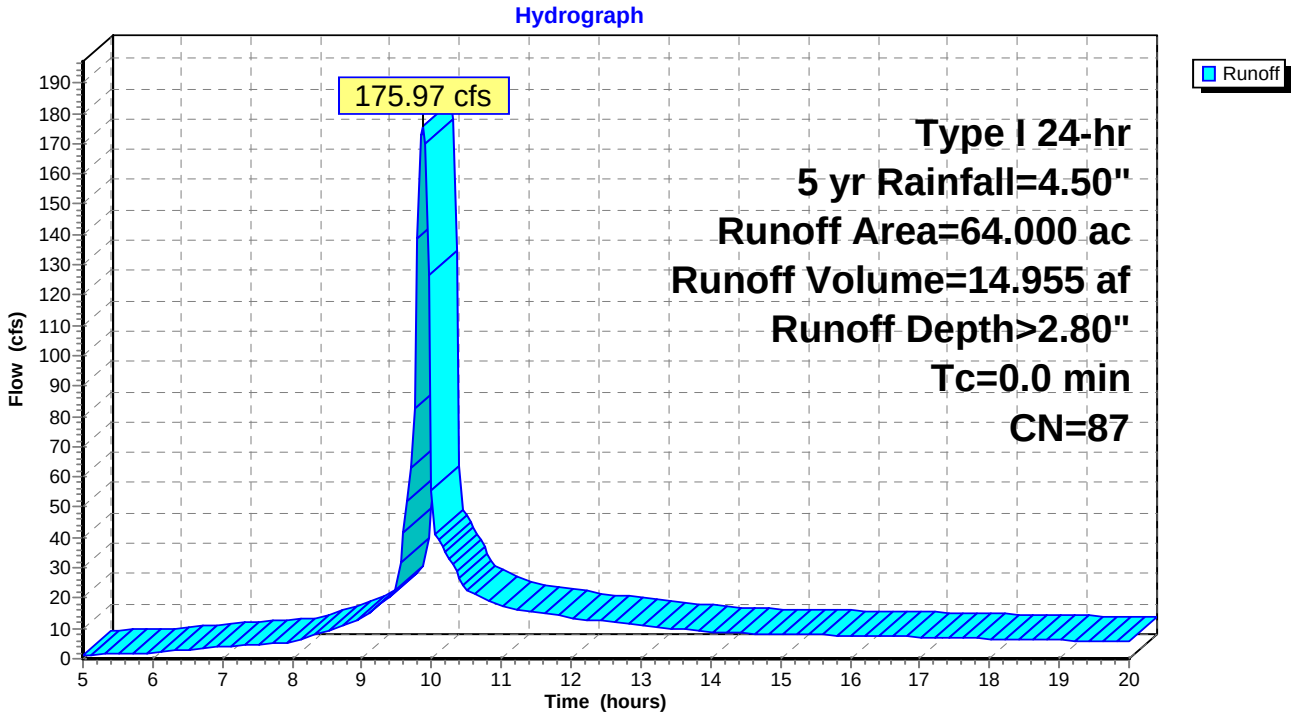
Summary for Subcatchment D-3: D-3

Runoff = 175.97 cfs @ 9.87 hrs, Volume= 14.955 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 5 yr Rainfall=4.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Subcatchment D-3: D-3



Hydrograph for Subcatchment D-3: D-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.45	0.01	1.25	10.30	2.53	1.33	30.93	15.60	3.69	2.35	7.84
5.10	0.46	0.02	1.33	10.40	2.58	1.38	26.69	15.70	3.70	2.37	7.80
5.20	0.47	0.02	1.41	10.50	2.62	1.42	22.59	15.80	3.72	2.38	7.75
5.30	0.48	0.02	1.50	10.60	2.66	1.45	21.38	15.90	3.73	2.39	7.70
5.40	0.49	0.02	1.58	10.70	2.70	1.48	20.36	16.00	3.74	2.40	7.65
5.50	0.51	0.03	1.66	10.80	2.74	1.51	19.33	16.10	3.76	2.41	7.60
5.60	0.52	0.03	1.74	10.90	2.77	1.54	18.29	16.20	3.77	2.43	7.55
5.70	0.53	0.03	1.82	11.00	2.80	1.57	17.28	16.30	3.78	2.44	7.50
5.80	0.54	0.03	1.90	11.10	2.83	1.60	16.88	16.40	3.80	2.45	7.46
5.90	0.55	0.04	1.98	11.20	2.86	1.62	16.52	16.50	3.81	2.46	7.41
6.00	0.56	0.04	2.07	11.30	2.89	1.65	16.15	16.60	3.82	2.47	7.36
6.10	0.57	0.04	2.22	11.40	2.92	1.67	15.78	16.70	3.83	2.48	7.31
6.20	0.59	0.05	2.39	11.50	2.95	1.70	15.41	16.80	3.85	2.50	7.26
6.30	0.60	0.05	2.57	11.60	2.98	1.72	15.04	16.90	3.86	2.51	7.21
6.40	0.61	0.05	2.75	11.70	3.00	1.74	14.66	17.00	3.87	2.52	7.16
6.50	0.63	0.06	2.94	11.80	3.03	1.76	14.28	17.10	3.88	2.53	7.11
6.60	0.64	0.06	3.14	11.90	3.05	1.79	13.90	17.20	3.89	2.54	7.06
6.70	0.66	0.07	3.35	12.00	3.08	1.81	13.52	17.30	3.91	2.55	7.01
6.80	0.67	0.07	3.56	12.10	3.10	1.83	13.27	17.40	3.92	2.56	6.96
6.90	0.69	0.08	3.79	12.20	3.12	1.85	13.04	17.50	3.93	2.57	6.91
7.00	0.70	0.09	4.01	12.30	3.15	1.87	12.80	17.60	3.94	2.58	6.86
7.10	0.72	0.09	4.16	12.40	3.17	1.89	12.56	17.70	3.95	2.59	6.81
7.20	0.74	0.10	4.31	12.50	3.19	1.91	12.32	17.80	3.96	2.60	6.76
7.30	0.75	0.11	4.46	12.60	3.21	1.93	12.08	17.90	3.98	2.61	6.71
7.40	0.77	0.11	4.61	12.70	3.23	1.94	11.84	18.00	3.99	2.62	6.66
7.50	0.79	0.12	4.76	12.80	3.25	1.96	11.59	18.10	4.00	2.64	6.61
7.60	0.80	0.13	4.91	12.90	3.27	1.98	11.35	18.20	4.01	2.65	6.56
7.70	0.82	0.13	5.05	13.00	3.29	2.00	11.10	18.30	4.02	2.66	6.50
7.80	0.84	0.14	5.20	13.10	3.31	2.02	10.86	18.40	4.03	2.67	6.45
7.90	0.86	0.15	5.35	13.20	3.33	2.03	10.61	18.50	4.04	2.68	6.40
8.00	0.87	0.16	5.53	13.30	3.35	2.05	10.36	18.60	4.05	2.69	6.35
8.10	0.89	0.17	6.19	13.40	3.37	2.06	10.11	18.70	4.06	2.70	6.30
8.20	0.91	0.18	6.92	13.50	3.39	2.08	9.86	18.80	4.07	2.70	6.25
8.30	0.93	0.19	7.68	13.60	3.40	2.09	9.61	18.90	4.08	2.71	6.20
8.40	0.96	0.20	8.48	13.70	3.42	2.11	9.36	19.00	4.09	2.72	6.15
8.50	0.99	0.22	9.30	13.80	3.43	2.12	9.11	19.10	4.11	2.73	6.09
8.60	1.01	0.23	10.12	13.90	3.45	2.14	8.85	19.20	4.12	2.74	6.04
8.70	1.04	0.25	10.96	14.00	3.46	2.15	8.61	19.30	4.13	2.75	5.99
8.80	1.07	0.27	11.84	14.10	3.48	2.16	8.55	19.40	4.14	2.76	5.94
8.90	1.11	0.28	12.74	14.20	3.49	2.18	8.51	19.50	4.15	2.77	5.89
9.00	1.14	0.30	13.72	14.30	3.51	2.19	8.46	19.60	4.16	2.78	5.84
9.10	1.18	0.33	15.27	14.40	3.52	2.20	8.41	19.70	4.17	2.79	5.79
9.20	1.22	0.35	16.92	14.50	3.54	2.22	8.37	19.80	4.17	2.80	5.73
9.30	1.27	0.38	18.64	14.60	3.55	2.23	8.32	19.90	4.18	2.81	5.68
9.40	1.31	0.41	20.43	14.70	3.57	2.24	8.27	20.00	**4.19**	**2.82**	5.63
9.50	1.36	0.44	23.34	14.80	3.58	2.26	8.23				
9.60	1.44	0.49	41.77	14.90	3.60	2.27	8.18				
9.70	1.55	0.57	63.00	15.00	3.61	2.28	8.13				
9.80	1.75	0.71	**138.85**	15.10	3.62	2.29	8.08				
9.90	2.08	0.97	**169.91**	15.20	3.64	2.31	8.04				
10.00	2.32	1.16	55.23	15.30	3.65	2.32	7.99				
10.10	2.39	1.22	39.13	15.40	3.66	2.33	7.94				
10.20	2.46	1.28	35.09	15.50	3.68	2.34	7.89				

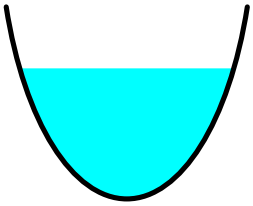
Summary for Reach D-3 split: C-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 2.80" for 5 yr event
Inflow = 175.97 cfs @ 9.87 hrs, Volume= 14.955 af
Outflow = 175.86 cfs @ 9.87 hrs, Volume= 14.951 af, Atten= 0%, Lag= 0.0 min

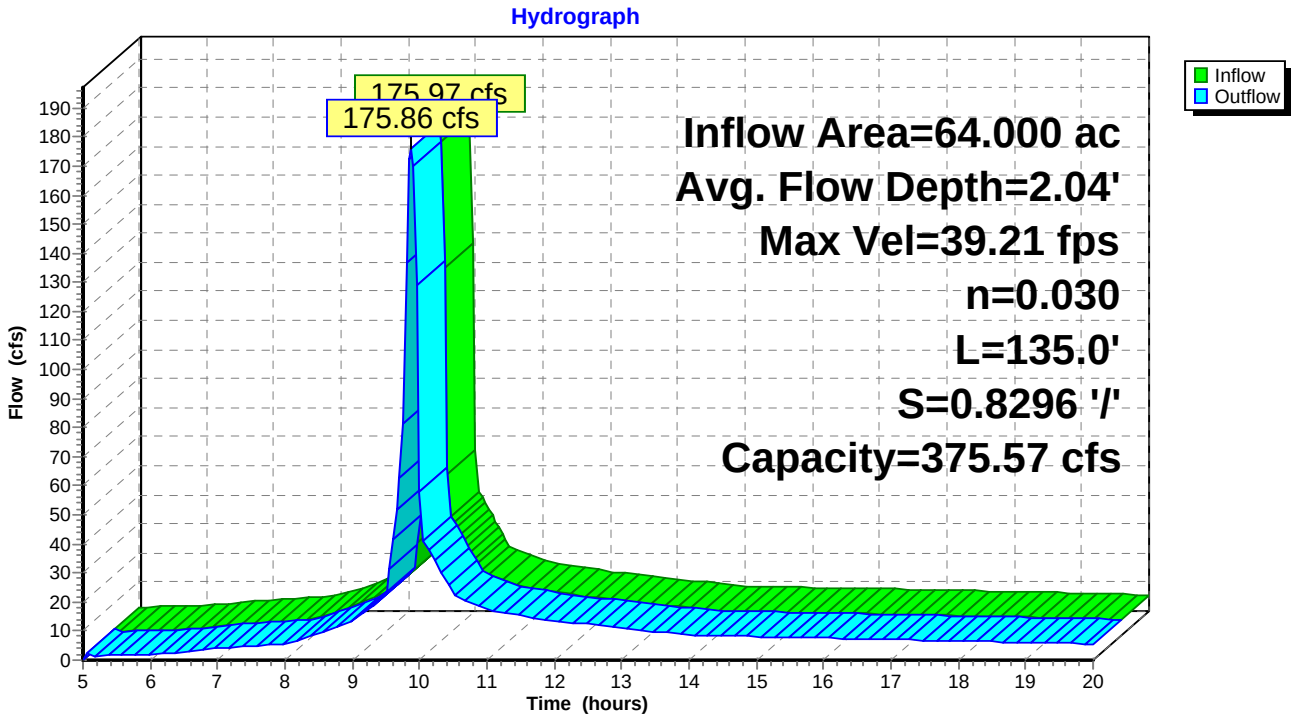
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 39.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 18.23 fps, Avg. Travel Time= 0.1 min

Peak Storage= 604 cf @ 9.87 hrs
Average Depth at Peak Storage= 2.04' , Surface Width= 3.30'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 375.57 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 135.0' Slope= 0.8296 '/'
Inlet Invert= 727.00', Outlet Invert= 615.00'



Reach D-3 split: C-3



Hydrograph for Reach D-3 split: C-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	1.25	0	727.00	0.00
5.25	1.45	22	727.22	1.87
5.50	1.66	18	727.20	1.50
5.75	1.86	22	727.22	1.92
6.00	2.07	23	727.23	2.04
6.25	2.48	26	727.25	2.49
6.50	2.94	30	727.27	2.93
6.75	3.46	33	727.29	3.45
7.00	4.01	37	727.32	4.00
7.25	4.39	39	727.33	4.38
7.50	4.76	42	727.34	4.75
7.75	5.13	44	727.36	5.12
8.00	5.53	47	727.37	5.53
8.25	7.30	57	727.42	7.28
8.50	9.30	68	727.47	9.28
8.75	11.40	79	727.52	11.38
9.00	13.72	90	727.57	13.69
9.25	17.77	109	727.65	17.73
9.50	23.34	132	727.74	23.23
9.75	**82.38**	**338**	**728.38**	**81.47**
10.00	**55.23**	**255**	**728.15**	**57.65**
10.25	33.02	170	727.88	32.77
10.50	22.59	131	727.73	22.88
10.75	19.85	117	727.68	19.73
11.00	17.28	107	727.64	17.39
11.25	16.34	102	727.62	16.29
11.50	15.41	98	727.61	15.45
11.75	14.47	93	727.59	14.46
12.00	13.52	89	727.57	13.54
12.25	12.92	86	727.56	12.92
12.50	12.32	83	727.54	12.33
12.75	11.72	80	727.53	11.72
13.00	11.10	77	727.52	11.11
13.25	10.49	74	727.50	10.49
13.50	9.86	71	727.49	9.87
13.75	9.23	67	727.47	9.24
14.00	8.61	64	727.46	8.62
14.25	8.48	63	727.45	8.48
14.50	8.37	63	727.45	8.37
14.75	8.25	62	727.45	8.25
15.00	8.13	62	727.44	8.13
15.25	8.01	61	727.44	8.01
15.50	7.89	60	727.44	7.89
15.75	7.77	60	727.43	7.77
16.00	7.65	59	727.43	7.65
16.25	7.53	58	727.43	7.53
16.50	7.41	57	727.42	7.41
16.75	7.28	57	727.42	7.28
17.00	7.16	56	727.42	7.16
17.25	7.03	55	727.41	7.04
17.50	6.91	55	727.41	6.91
17.75	6.78	54	727.41	6.78
18.00	6.66	53	727.40	6.66
18.25	6.53	52	727.40	6.53
18.50	6.40	52	727.40	6.40
18.75	6.27	51	727.39	6.28
19.00	6.15	50	727.39	6.15
19.25	6.02	49	727.38	6.02
19.50	5.89	49	727.38	5.89
19.75	5.76	48	727.38	5.76
20.00	5.63	47	727.37	5.63

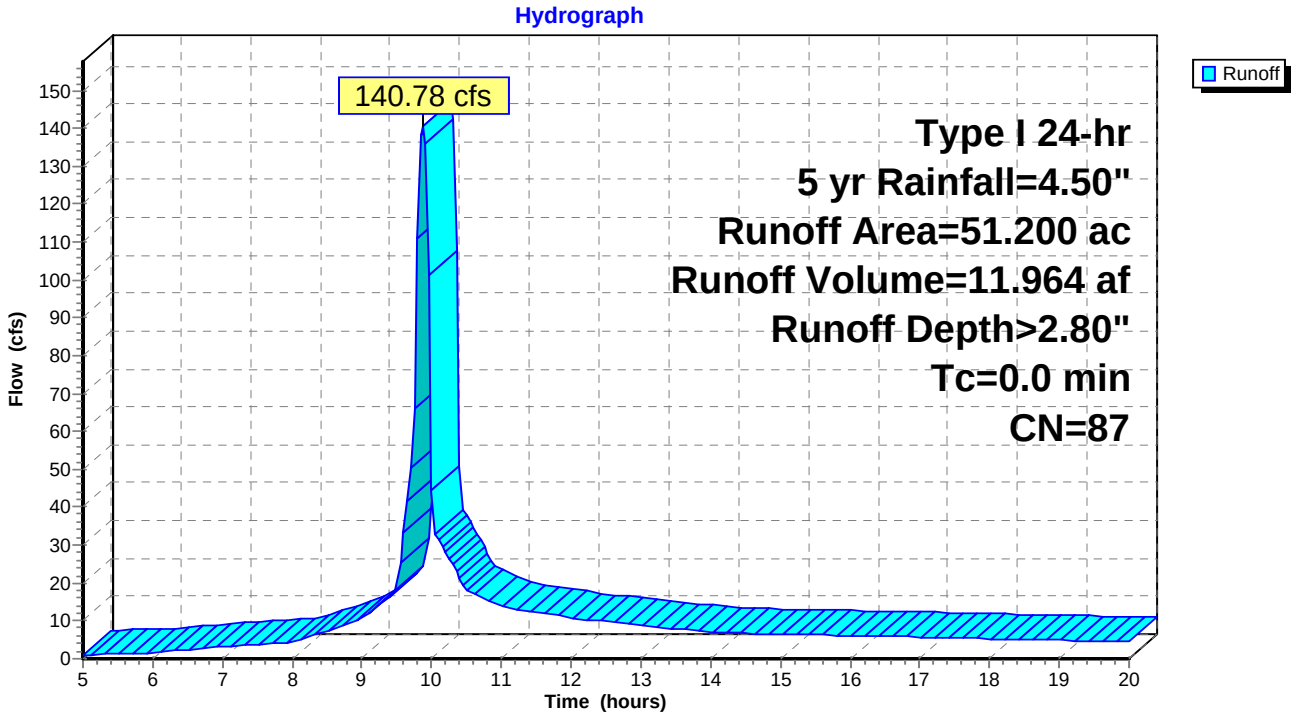
Summary for Subcatchment D1: D-1

Runoff = 140.78 cfs @ 9.87 hrs, Volume= 11.964 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 5 yr Rainfall=4.50"

Area (ac)	CN	Description
51.200	87	1/4 acre lots, 38% imp, HSG D
31.744		62.00% Pervious Area
19.456		38.00% Impervious Area

Subcatchment D1: D-1



Hydrograph for Subcatchment D1: D-1

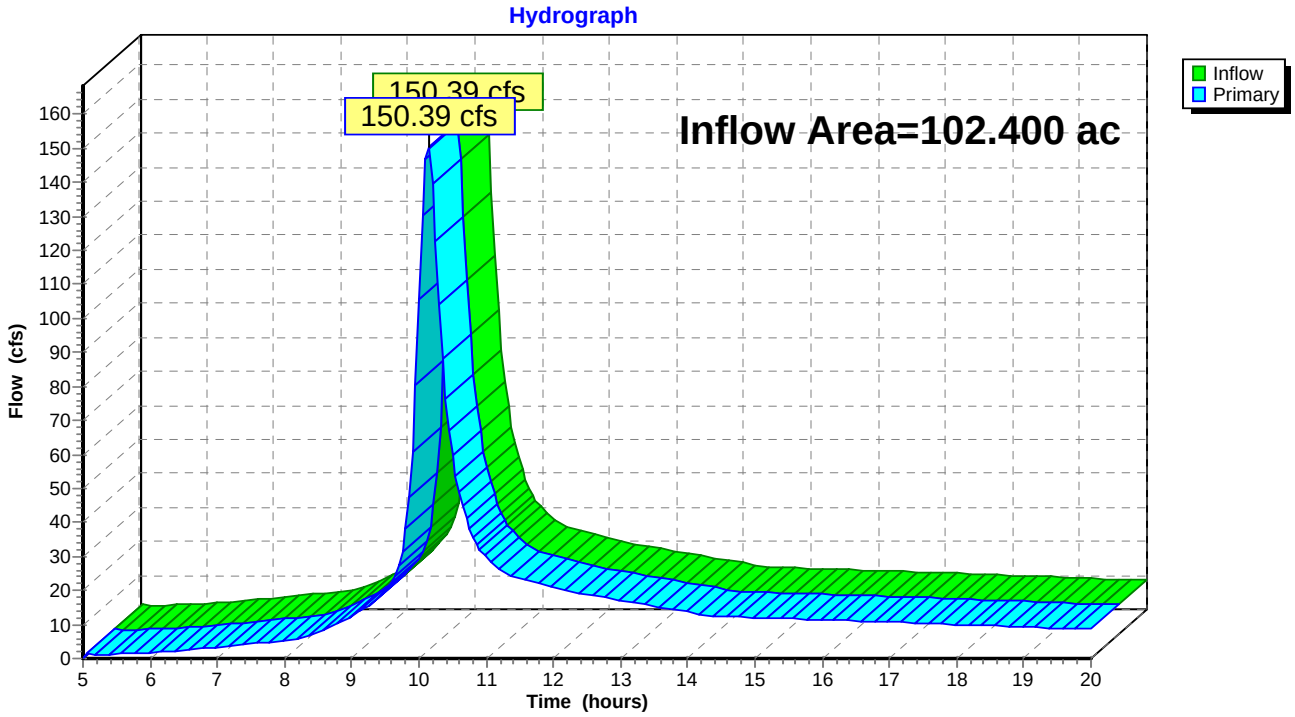
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.45	0.01	1.00	10.30	2.53	1.33	24.75	15.60	3.69	2.35	6.28
5.10	0.46	0.02	1.06	10.40	2.58	1.38	21.35	15.70	3.70	2.37	6.24
5.20	0.47	0.02	1.13	10.50	2.62	1.42	18.07	15.80	3.72	2.38	6.20
5.30	0.48	0.02	1.20	10.60	2.66	1.45	17.10	15.90	3.73	2.39	6.16
5.40	0.49	0.02	1.26	10.70	2.70	1.48	16.29	16.00	3.74	2.40	6.12
5.50	0.51	0.03	1.33	10.80	2.74	1.51	15.47	16.10	3.76	2.41	6.08
5.60	0.52	0.03	1.39	10.90	2.77	1.54	14.63	16.20	3.77	2.43	6.04
5.70	0.53	0.03	1.46	11.00	2.80	1.57	13.83	16.30	3.78	2.44	6.00
5.80	0.54	0.03	1.52	11.10	2.83	1.60	13.51	16.40	3.80	2.45	5.96
5.90	0.55	0.04	1.59	11.20	2.86	1.62	13.22	16.50	3.81	2.46	5.92
6.00	0.56	0.04	1.65	11.30	2.89	1.65	12.92	16.60	3.82	2.47	5.89
6.10	0.57	0.04	1.78	11.40	2.92	1.67	12.63	16.70	3.83	2.48	5.85
6.20	0.59	0.05	1.91	11.50	2.95	1.70	12.33	16.80	3.85	2.50	5.81
6.30	0.60	0.05	2.06	11.60	2.98	1.72	12.03	16.90	3.86	2.51	5.77
6.40	0.61	0.05	2.20	11.70	3.00	1.74	11.73	17.00	3.87	2.52	5.73
6.50	0.63	0.06	2.36	11.80	3.03	1.76	11.42	17.10	3.88	2.53	5.69
6.60	0.64	0.06	2.52	11.90	3.05	1.79	11.12	17.20	3.89	2.54	5.65
6.70	0.66	0.07	2.68	12.00	3.08	1.81	10.82	17.30	3.91	2.55	5.61
6.80	0.67	0.07	2.85	12.10	3.10	1.83	10.62	17.40	3.92	2.56	5.57
6.90	0.69	0.08	3.03	12.20	3.12	1.85	10.43	17.50	3.93	2.57	5.53
7.00	0.70	0.09	3.21	12.30	3.15	1.87	10.24	17.60	3.94	2.58	5.49
7.10	0.72	0.09	3.33	12.40	3.17	1.89	10.05	17.70	3.95	2.59	5.45
7.20	0.74	0.10	3.45	12.50	3.19	1.91	9.86	17.80	3.96	2.60	5.41
7.30	0.75	0.11	3.57	12.60	3.21	1.93	9.66	17.90	3.98	2.61	5.37
7.40	0.77	0.11	3.69	12.70	3.23	1.94	9.47	18.00	3.99	2.62	5.33
7.50	0.79	0.12	3.81	12.80	3.25	1.96	9.28	18.10	4.00	2.64	5.28
7.60	0.80	0.13	3.92	12.90	3.27	1.98	9.08	18.20	4.01	2.65	5.24
7.70	0.82	0.13	4.04	13.00	3.29	2.00	8.88	18.30	4.02	2.66	5.20
7.80	0.84	0.14	4.16	13.10	3.31	2.02	8.69	18.40	4.03	2.67	5.16
7.90	0.86	0.15	4.28	13.20	3.33	2.03	8.49	18.50	4.04	2.68	5.12
8.00	0.87	0.16	4.43	13.30	3.35	2.05	8.29	18.60	4.05	2.69	5.08
8.10	0.89	0.17	4.96	13.40	3.37	2.06	8.09	18.70	4.06	2.70	5.04
8.20	0.91	0.18	5.54	13.50	3.39	2.08	7.89	18.80	4.07	2.70	5.00
8.30	0.93	0.19	6.15	13.60	3.40	2.09	7.69	18.90	4.08	2.71	4.96
8.40	0.96	0.20	6.78	13.70	3.42	2.11	7.49	19.00	4.09	2.72	4.92
8.50	0.99	0.22	7.44	13.80	3.43	2.12	7.28	19.10	4.11	2.73	4.88
8.60	1.01	0.23	8.10	13.90	3.45	2.14	7.08	19.20	4.12	2.74	4.83
8.70	1.04	0.25	8.77	14.00	3.46	2.15	6.89	19.30	4.13	2.75	4.79
8.80	1.07	0.27	9.47	14.10	3.48	2.16	6.84	19.40	4.14	2.76	4.75
8.90	1.11	0.28	10.19	14.20	3.49	2.18	6.80	19.50	4.15	2.77	4.71
9.00	1.14	0.30	10.97	14.30	3.51	2.19	6.77	19.60	4.16	2.78	4.67
9.10	1.18	0.33	12.21	14.40	3.52	2.20	6.73	19.70	4.17	2.79	4.63
9.20	1.22	0.35	13.54	14.50	3.54	2.22	6.69	19.80	4.17	2.80	4.59
9.30	1.27	0.38	14.91	14.60	3.55	2.23	6.66	19.90	4.18	2.81	4.55
9.40	1.31	0.41	16.34	14.70	3.57	2.24	6.62	20.00	**4.19**	**2.82**	4.50
9.50	1.36	0.44	18.67	14.80	3.58	2.26	6.58				
9.60	1.44	0.49	33.41	14.90	3.60	2.27	6.54				
9.70	1.55	0.57	50.40	15.00	3.61	2.28	6.51				
9.80	1.75	0.71	**111.08**	15.10	3.62	2.29	6.47				
9.90	2.08	0.97	**135.93**	15.20	3.64	2.31	6.43				
10.00	2.32	1.16	44.18	15.30	3.65	2.32	6.39				
10.10	2.39	1.22	31.31	15.40	3.66	2.33	6.35				
10.20	2.46	1.28	28.07	15.50	3.68	2.34	6.31				

Summary for Pond D2 exit: Free flow

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 2.35" for 5 yr event
Inflow = 150.39 cfs @ 10.14 hrs, Volume= 20.095 af
Primary = 150.39 cfs @ 10.14 hrs, Volume= 20.095 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D2 exit: Free flow



Hydrograph for Pond D2 exit: Free flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00
5.25	1.40		1.40
5.50	1.35		1.35
5.75	1.62		1.62
6.00	1.81		1.81
6.25	2.03		2.03
6.50	2.39		2.39
6.75	2.83		2.83
7.00	3.33		3.33
7.25	3.86		3.86
7.50	4.29		4.29
7.75	4.75		4.75
8.00	5.28		5.28
8.25	5.95		5.95
8.50	7.60		7.60
8.75	9.90		9.90
9.00	12.51		12.51
9.25	15.62		15.62
9.50	20.26		20.26
9.75	31.49		31.49
10.00	**105.49**		**105.49**
10.25	**122.51**		**122.51**
10.50	59.70		59.70
10.75	38.07		38.07
11.00	29.62		29.62
11.25	25.62		25.62
11.50	23.59		23.59
11.75	22.24		22.24
12.00	20.95		20.95
12.25	19.70		19.70
12.50	18.73		18.73
12.75	17.90		17.90
13.00	17.06		17.06
13.25	16.22		16.22
13.50	15.36		15.36
13.75	14.48		14.48
14.00	13.60		13.60
14.25	12.77		12.77
14.50	12.38		12.38
14.75	12.19		12.19
15.00	12.02		12.02
15.25	11.87		11.87
15.50	11.70		11.70
15.75	11.54		11.54
16.00	11.38		11.38
16.25	11.21		11.21
16.50	11.05		11.05
16.75	10.88		10.88
17.00	10.70		10.70
17.25	10.53		10.53
17.50	10.36		10.36
17.75	10.18		10.18
18.00	10.01		10.01
18.25	9.83		9.83
18.50	9.65		9.65
18.75	9.47		9.47
19.00	9.29		9.29
19.25	9.11		9.11
19.50	8.92		8.92
19.75	8.74		8.74
20.00	8.55		8.55

Summary for Subcatchment D2-1: D2

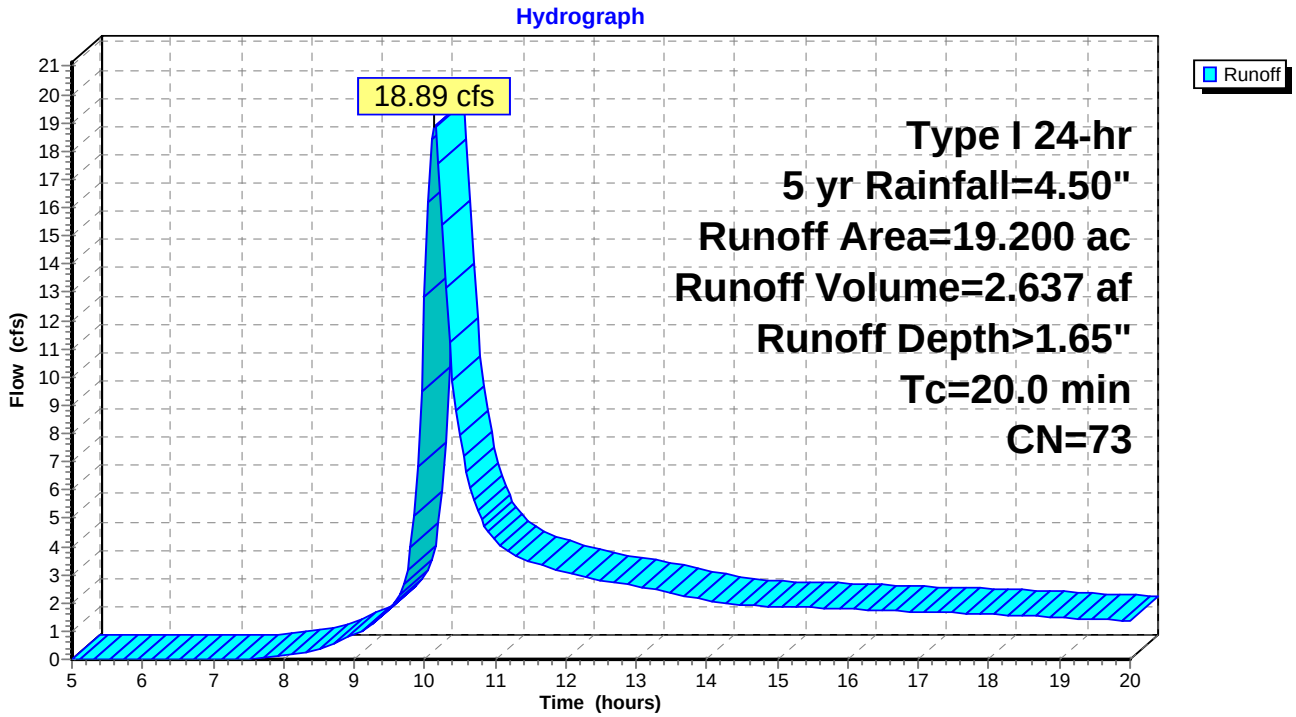
Runoff = 18.89 cfs @ 10.14 hrs, Volume= 2.637 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 5 yr Rainfall=4.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-1: D2



Hydrograph for Subcatchment D2-1: D2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.45	0.00	0.00	10.30	2.53	0.58	13.14	15.60	3.69	1.31	1.82
5.10	0.46	0.00	0.00	10.40	2.58	0.61	9.85	15.70	3.70	1.32	1.81
5.20	0.47	0.00	0.00	10.50	2.62	0.64	7.94	15.80	3.72	1.33	1.80
5.30	0.48	0.00	0.00	10.60	2.66	0.66	6.62	15.90	3.73	1.34	1.79
5.40	0.49	0.00	0.00	10.70	2.70	0.68	5.64	16.00	3.74	1.35	1.79
5.50	0.51	0.00	0.00	10.80	2.74	0.70	4.96	16.10	3.76	1.36	1.78
5.60	0.52	0.00	0.00	10.90	2.77	0.72	4.53	16.20	3.77	1.36	1.77
5.70	0.53	0.00	0.00	11.00	2.80	0.74	4.21	16.30	3.78	1.37	1.76
5.80	0.54	0.00	0.00	11.10	2.83	0.76	3.97	16.40	3.80	1.38	1.75
5.90	0.55	0.00	0.00	11.20	2.86	0.78	3.77	16.50	3.81	1.39	1.74
6.00	0.56	0.00	0.00	11.30	2.89	0.79	3.63	16.60	3.82	1.40	1.73
6.10	0.57	0.00	0.00	11.40	2.92	0.81	3.52	16.70	3.83	1.41	1.72
6.20	0.59	0.00	0.00	11.50	2.95	0.83	3.44	16.80	3.85	1.42	1.71
6.30	0.60	0.00	0.00	11.60	2.98	0.84	3.37	16.90	3.86	1.43	1.70
6.40	0.61	0.00	0.00	11.70	3.00	0.86	3.30	17.00	3.87	1.43	1.69
6.50	0.63	0.00	0.00	11.80	3.03	0.88	3.24	17.10	3.88	1.44	1.68
6.60	0.64	0.00	0.00	11.90	3.05	0.89	3.17	17.20	3.89	1.45	1.67
6.70	0.66	0.00	0.00	12.00	3.08	0.91	3.10	17.30	3.91	1.46	1.66
6.80	0.67	0.00	0.00	12.10	3.10	0.92	3.03	17.40	3.92	1.47	1.65
6.90	0.69	0.00	0.00	12.20	3.12	0.94	2.97	17.50	3.93	1.48	1.64
7.00	0.70	0.00	0.00	12.30	3.15	0.95	2.91	17.60	3.94	1.49	1.63
7.10	0.72	0.00	0.00	12.40	3.17	0.96	2.86	17.70	3.95	1.49	1.62
7.20	0.74	0.00	0.00	12.50	3.19	0.98	2.81	17.80	3.96	1.50	1.61
7.30	0.75	0.00	0.00	12.60	3.21	0.99	2.76	17.90	3.98	1.51	1.60
7.40	0.77	0.00	0.00	12.70	3.23	1.00	2.72	18.00	3.99	1.52	1.59
7.50	0.79	0.00	0.01	12.80	3.25	1.02	2.67	18.10	4.00	1.53	1.58
7.60	0.80	0.00	0.03	12.90	3.27	1.03	2.63	18.20	4.01	1.53	1.57
7.70	0.82	0.00	0.05	13.00	3.29	1.04	2.58	18.30	4.02	1.54	1.56
7.80	0.84	0.00	0.08	13.10	3.31	1.06	2.53	18.40	4.03	1.55	1.55
7.90	0.86	0.00	0.11	13.20	3.33	1.07	2.49	18.50	4.04	1.56	1.54
8.00	0.87	0.00	0.14	13.30	3.35	1.08	2.44	18.60	4.05	1.57	1.53
8.10	0.89	0.01	0.17	13.40	3.37	1.09	2.39	18.70	4.06	1.57	1.52
8.20	0.91	0.01	0.20	13.50	3.39	1.10	2.34	18.80	4.07	1.58	1.51
8.30	0.93	0.01	0.25	13.60	3.40	1.11	2.29	18.90	4.08	1.59	1.50
8.40	0.96	0.01	0.30	13.70	3.42	1.13	2.24	19.00	4.09	1.60	1.49
8.50	0.99	0.02	0.37	13.80	3.43	1.14	2.19	19.10	4.11	1.60	1.48
8.60	1.01	0.02	0.45	13.90	3.45	1.15	2.14	19.20	4.12	1.61	1.46
8.70	1.04	0.02	0.54	14.00	3.46	1.16	2.09	19.30	4.13	1.62	1.45
8.80	1.07	0.03	0.64	14.10	3.48	1.17	2.03	19.40	4.14	1.63	1.44
8.90	1.11	0.03	0.75	14.20	3.49	1.18	1.99	19.50	4.15	1.63	1.43
9.00	1.14	0.04	0.87	14.30	3.51	1.19	1.95	19.60	4.16	1.64	1.42
9.10	1.18	0.05	1.00	14.40	3.52	1.20	1.93	19.70	4.17	1.65	1.41
9.20	1.22	0.06	1.15	14.50	3.54	1.21	1.91	19.80	4.17	1.65	1.40
9.30	1.27	0.07	1.33	14.60	3.55	1.22	1.90	19.90	4.18	1.66	1.39
9.40	1.31	0.08	1.54	14.70	3.57	1.22	1.89	20.00	**4.19**	**1.67**	1.38
9.50	1.36	0.09	1.79	14.80	3.58	1.23	1.89				
9.60	1.44	0.11	2.09	14.90	3.60	1.24	1.88				
9.70	1.55	0.15	2.65	15.00	3.61	1.25	1.87				
9.80	1.75	0.21	3.96	15.10	3.62	1.26	1.86				
9.90	2.08	0.36	6.85	15.20	3.64	1.27	1.85				
10.00	2.32	0.47	12.84	15.30	3.65	1.28	1.84				
10.10	2.39	0.51	**18.43**	15.40	3.66	1.29	1.84				
10.20	2.46	0.55	**17.55**	15.50	3.68	1.30	1.83				

Summary for Subcatchment D2-2: D2

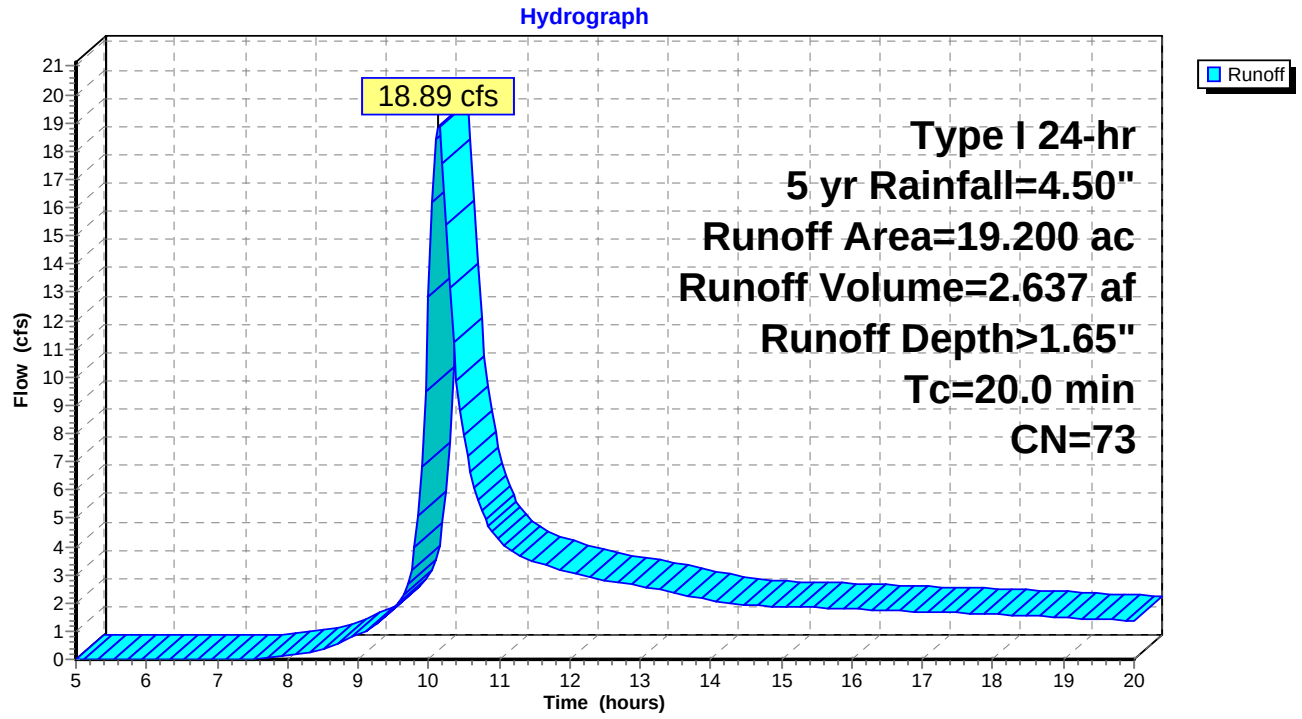
Runoff = 18.89 cfs @ 10.14 hrs, Volume= 2.637 af, Depth> 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 5 yr Rainfall=4.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-2: D2



Hydrograph for Subcatchment D2-2: D2

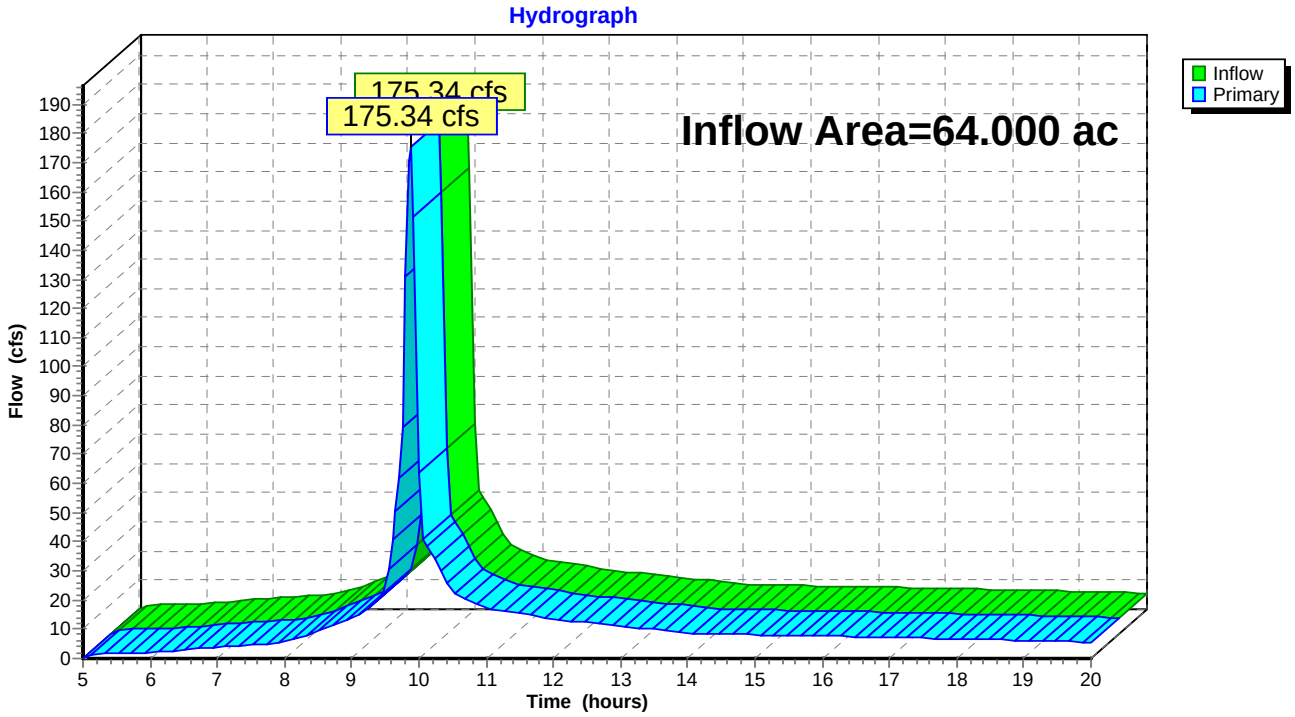
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.45	0.00	0.00	10.30	2.53	0.58	13.14	15.60	3.69	1.31	1.82
5.10	0.46	0.00	0.00	10.40	2.58	0.61	9.85	15.70	3.70	1.32	1.81
5.20	0.47	0.00	0.00	10.50	2.62	0.64	7.94	15.80	3.72	1.33	1.80
5.30	0.48	0.00	0.00	10.60	2.66	0.66	6.62	15.90	3.73	1.34	1.79
5.40	0.49	0.00	0.00	10.70	2.70	0.68	5.64	16.00	3.74	1.35	1.79
5.50	0.51	0.00	0.00	10.80	2.74	0.70	4.96	16.10	3.76	1.36	1.78
5.60	0.52	0.00	0.00	10.90	2.77	0.72	4.53	16.20	3.77	1.36	1.77
5.70	0.53	0.00	0.00	11.00	2.80	0.74	4.21	16.30	3.78	1.37	1.76
5.80	0.54	0.00	0.00	11.10	2.83	0.76	3.97	16.40	3.80	1.38	1.75
5.90	0.55	0.00	0.00	11.20	2.86	0.78	3.77	16.50	3.81	1.39	1.74
6.00	0.56	0.00	0.00	11.30	2.89	0.79	3.63	16.60	3.82	1.40	1.73
6.10	0.57	0.00	0.00	11.40	2.92	0.81	3.52	16.70	3.83	1.41	1.72
6.20	0.59	0.00	0.00	11.50	2.95	0.83	3.44	16.80	3.85	1.42	1.71
6.30	0.60	0.00	0.00	11.60	2.98	0.84	3.37	16.90	3.86	1.43	1.70
6.40	0.61	0.00	0.00	11.70	3.00	0.86	3.30	17.00	3.87	1.43	1.69
6.50	0.63	0.00	0.00	11.80	3.03	0.88	3.24	17.10	3.88	1.44	1.68
6.60	0.64	0.00	0.00	11.90	3.05	0.89	3.17	17.20	3.89	1.45	1.67
6.70	0.66	0.00	0.00	12.00	3.08	0.91	3.10	17.30	3.91	1.46	1.66
6.80	0.67	0.00	0.00	12.10	3.10	0.92	3.03	17.40	3.92	1.47	1.65
6.90	0.69	0.00	0.00	12.20	3.12	0.94	2.97	17.50	3.93	1.48	1.64
7.00	0.70	0.00	0.00	12.30	3.15	0.95	2.91	17.60	3.94	1.49	1.63
7.10	0.72	0.00	0.00	12.40	3.17	0.96	2.86	17.70	3.95	1.49	1.62
7.20	0.74	0.00	0.00	12.50	3.19	0.98	2.81	17.80	3.96	1.50	1.61
7.30	0.75	0.00	0.00	12.60	3.21	0.99	2.76	17.90	3.98	1.51	1.60
7.40	0.77	0.00	0.00	12.70	3.23	1.00	2.72	18.00	3.99	1.52	1.59
7.50	0.79	0.00	0.01	12.80	3.25	1.02	2.67	18.10	4.00	1.53	1.58
7.60	0.80	0.00	0.03	12.90	3.27	1.03	2.63	18.20	4.01	1.53	1.57
7.70	0.82	0.00	0.05	13.00	3.29	1.04	2.58	18.30	4.02	1.54	1.56
7.80	0.84	0.00	0.08	13.10	3.31	1.06	2.53	18.40	4.03	1.55	1.55
7.90	0.86	0.00	0.11	13.20	3.33	1.07	2.49	18.50	4.04	1.56	1.54
8.00	0.87	0.00	0.14	13.30	3.35	1.08	2.44	18.60	4.05	1.57	1.53
8.10	0.89	0.01	0.17	13.40	3.37	1.09	2.39	18.70	4.06	1.57	1.52
8.20	0.91	0.01	0.20	13.50	3.39	1.10	2.34	18.80	4.07	1.58	1.51
8.30	0.93	0.01	0.25	13.60	3.40	1.11	2.29	18.90	4.08	1.59	1.50
8.40	0.96	0.01	0.30	13.70	3.42	1.13	2.24	19.00	4.09	1.60	1.49
8.50	0.99	0.02	0.37	13.80	3.43	1.14	2.19	19.10	4.11	1.60	1.48
8.60	1.01	0.02	0.45	13.90	3.45	1.15	2.14	19.20	4.12	1.61	1.46
8.70	1.04	0.02	0.54	14.00	3.46	1.16	2.09	19.30	4.13	1.62	1.45
8.80	1.07	0.03	0.64	14.10	3.48	1.17	2.03	19.40	4.14	1.63	1.44
8.90	1.11	0.03	0.75	14.20	3.49	1.18	1.99	19.50	4.15	1.63	1.43
9.00	1.14	0.04	0.87	14.30	3.51	1.19	1.95	19.60	4.16	1.64	1.42
9.10	1.18	0.05	1.00	14.40	3.52	1.20	1.93	19.70	4.17	1.65	1.41
9.20	1.22	0.06	1.15	14.50	3.54	1.21	1.91	19.80	4.17	1.65	1.40
9.30	1.27	0.07	1.33	14.60	3.55	1.22	1.90	19.90	4.18	1.66	1.39
9.40	1.31	0.08	1.54	14.70	3.57	1.22	1.89	20.00	**4.19**	**1.67**	1.38
9.50	1.36	0.09	1.79	14.80	3.58	1.23	1.89				
9.60	1.44	0.11	2.09	14.90	3.60	1.24	1.88				
9.70	1.55	0.15	2.65	15.00	3.61	1.25	1.87				
9.80	1.75	0.21	3.96	15.10	3.62	1.26	1.86				
9.90	2.08	0.36	6.85	15.20	3.64	1.27	1.85				
10.00	2.32	0.47	12.84	15.30	3.65	1.28	1.84				
10.10	2.39	0.51	**18.43**	15.40	3.66	1.29	1.84				
10.20	2.46	0.55	**17.55**	15.50	3.68	1.30	1.83				

Summary for Pond D3 exit: Free Flow

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 2.80" for 5 yr event
Inflow = 175.34 cfs @ 9.87 hrs, Volume= 14.947 af
Primary = 175.34 cfs @ 9.87 hrs, Volume= 14.947 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D3 exit: Free Flow



Hydrograph for Pond D3 exit: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00	18.25	6.53		6.53
5.25	1.31		1.31	18.50	6.41		6.41
5.50	1.74		1.74	18.75	6.28		6.28
5.75	1.81		1.81	19.00	6.15		6.15
6.00	2.08		2.08	19.25	6.02		6.02
6.25	2.45		2.45	19.50	5.89		5.89
6.50	2.93		2.93	19.75	5.76		5.76
6.75	3.43		3.43	20.00	5.63		5.63
7.00	3.99		3.99				
7.25	4.37		4.37				
7.50	4.74		4.74				
7.75	5.11		5.11				
8.00	5.51		5.51				
8.25	7.23		7.23				
8.50	9.23		9.23				
8.75	11.33		11.33				
9.00	13.63		13.63				
9.25	17.64		17.64				
9.50	23.00		23.00				
9.75	**79.54**		**79.54**				
10.00	**63.75**		**63.75**				
10.25	32.74		32.74				
10.50	22.99		22.99				
10.75	19.91		19.91				
11.00	17.33		17.33				
11.25	16.39		16.39				
11.50	15.42		15.42				
11.75	14.51		14.51				
12.00	13.54		13.54				
12.25	12.94		12.94				
12.50	12.34		12.34				
12.75	11.74		11.74				
13.00	11.12		11.12				
13.25	10.51		10.51				
13.50	9.88		9.88				
13.75	9.25		9.25				
14.00	8.63		8.63				
14.25	8.49		8.49				
14.50	8.37		8.37				
14.75	8.25		8.25				
15.00	8.14		8.14				
15.25	8.02		8.02				
15.50	7.90		7.90				
15.75	7.78		7.78				
16.00	7.65		7.65				
16.25	7.53		7.53				
16.50	7.41		7.41				
16.75	7.29		7.29				
17.00	7.16		7.16				
17.25	7.04		7.04				
17.50	6.91		6.91				
17.75	6.79		6.79				
18.00	6.66		6.66				

Summary for Subcatchment D3-2: D3

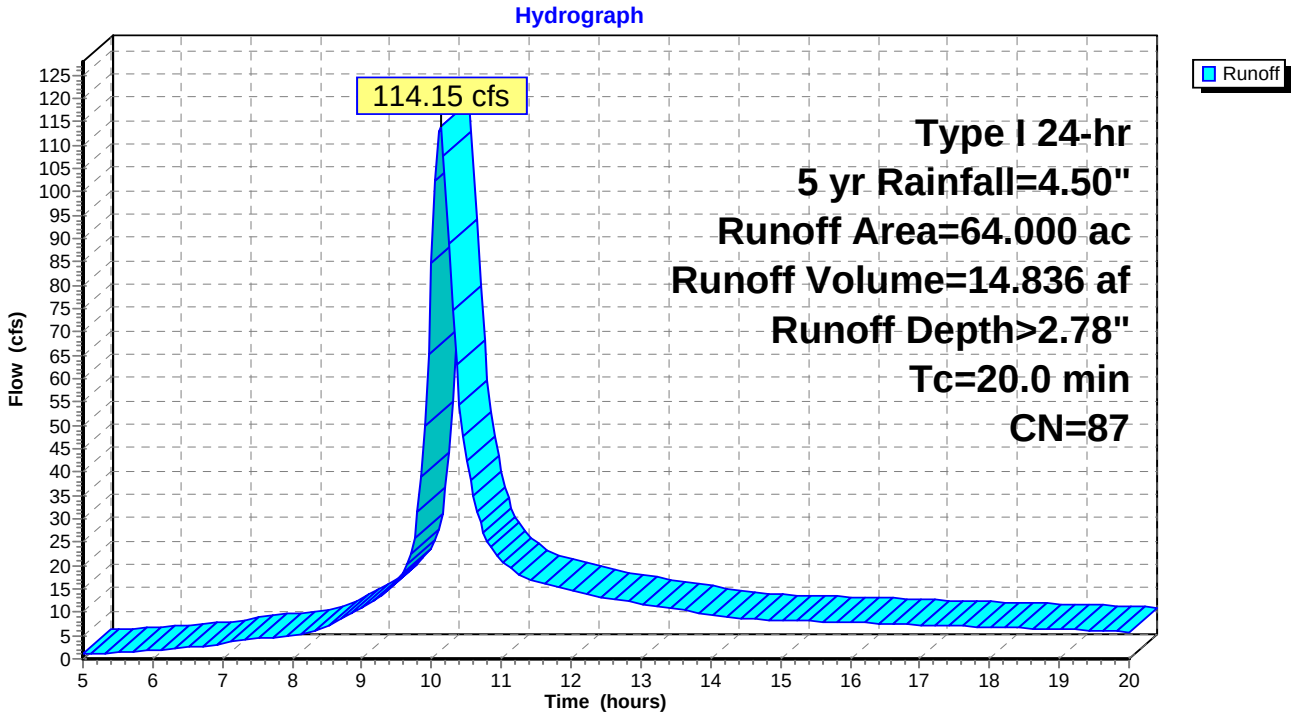
Runoff = 114.15 cfs @ 10.12 hrs, Volume= 14.836 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 5 yr Rainfall=4.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D3-2: D3



Hydrograph for Subcatchment D3-2: D3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.45	0.01	0.98	10.30	2.53	1.33	74.54	15.60	3.69	2.35	7.99
5.10	0.46	0.02	1.07	10.40	2.58	1.38	54.25	15.70	3.70	2.37	7.95
5.20	0.47	0.02	1.15	10.50	2.62	1.42	42.55	15.80	3.72	2.38	7.90
5.30	0.48	0.02	1.24	10.60	2.66	1.45	34.71	15.90	3.73	2.39	7.85
5.40	0.49	0.02	1.32	10.70	2.70	1.48	29.08	16.00	3.74	2.40	7.80
5.50	0.51	0.03	1.40	10.80	2.74	1.51	25.24	16.10	3.76	2.41	7.75
5.60	0.52	0.03	1.49	10.90	2.77	1.54	22.74	16.20	3.77	2.43	7.70
5.70	0.53	0.03	1.57	11.00	2.80	1.57	20.97	16.30	3.78	2.44	7.66
5.80	0.54	0.03	1.65	11.10	2.83	1.60	19.62	16.40	3.80	2.45	7.61
5.90	0.55	0.04	1.73	11.20	2.86	1.62	18.54	16.50	3.81	2.46	7.56
6.00	0.56	0.04	1.82	11.30	2.89	1.65	17.72	16.60	3.82	2.47	7.51
6.10	0.57	0.04	1.90	11.40	2.92	1.67	17.12	16.70	3.83	2.48	7.46
6.20	0.59	0.05	1.98	11.50	2.95	1.70	16.64	16.80	3.85	2.50	7.41
6.30	0.60	0.05	2.10	11.60	2.98	1.72	16.23	16.90	3.86	2.51	7.36
6.40	0.61	0.05	2.24	11.70	3.00	1.74	15.83	17.00	3.87	2.52	7.31
6.50	0.63	0.06	2.39	11.80	3.03	1.76	15.45	17.10	3.88	2.53	7.26
6.60	0.64	0.06	2.57	11.90	3.05	1.79	15.07	17.20	3.89	2.54	7.21
6.70	0.66	0.07	2.75	12.00	3.08	1.81	14.69	17.30	3.91	2.55	7.16
6.80	0.67	0.07	2.94	12.10	3.10	1.83	14.31	17.40	3.92	2.56	7.11
6.90	0.69	0.08	3.13	12.20	3.12	1.85	13.94	17.50	3.93	2.57	7.06
7.00	0.70	0.09	3.34	12.30	3.15	1.87	13.62	17.60	3.94	2.58	7.01
7.10	0.72	0.09	3.55	12.40	3.17	1.89	13.34	17.70	3.95	2.59	6.96
7.20	0.74	0.10	3.76	12.50	3.19	1.91	13.08	17.80	3.96	2.60	6.91
7.30	0.75	0.11	3.96	12.60	3.21	1.93	12.83	17.90	3.98	2.61	6.86
7.40	0.77	0.11	4.13	12.70	3.23	1.94	12.59	18.00	3.99	2.62	6.81
7.50	0.79	0.12	4.29	12.80	3.25	1.96	12.35	18.10	4.00	2.64	6.76
7.60	0.80	0.13	4.44	12.90	3.27	1.98	12.10	18.20	4.01	2.65	6.71
7.70	0.82	0.13	4.59	13.00	3.29	2.00	11.86	18.30	4.02	2.66	6.66
7.80	0.84	0.14	4.74	13.10	3.31	2.02	11.62	18.40	4.03	2.67	6.61
7.90	0.86	0.15	4.89	13.20	3.33	2.03	11.37	18.50	4.04	2.68	6.56
8.00	0.87	0.16	5.04	13.30	3.35	2.05	11.13	18.60	4.05	2.69	6.51
8.10	0.89	0.17	5.19	13.40	3.37	2.06	10.88	18.70	4.06	2.70	6.46
8.20	0.91	0.18	5.40	13.50	3.39	2.08	10.63	18.80	4.07	2.70	6.41
8.30	0.93	0.19	5.77	13.60	3.40	2.09	10.38	18.90	4.08	2.71	6.36
8.40	0.96	0.20	6.30	13.70	3.42	2.11	10.13	19.00	4.09	2.72	6.30
8.50	0.99	0.22	6.96	13.80	3.43	2.12	9.88	19.10	4.11	2.73	6.25
8.60	1.01	0.23	7.68	13.90	3.45	2.14	9.63	19.20	4.12	2.74	6.20
8.70	1.04	0.25	8.45	14.00	3.46	2.15	9.38	19.30	4.13	2.75	6.15
8.80	1.07	0.27	9.25	14.10	3.48	2.16	9.13	19.40	4.14	2.76	6.10
8.90	1.11	0.28	10.07	14.20	3.49	2.18	8.90	19.50	4.15	2.77	6.05
9.00	1.14	0.30	10.91	14.30	3.51	2.19	8.73	19.60	4.16	2.78	6.00
9.10	1.18	0.33	11.79	14.40	3.52	2.20	8.62	19.70	4.17	2.79	5.95
9.20	1.22	0.35	12.76	14.50	3.54	2.22	8.54	19.80	4.17	2.80	5.89
9.30	1.27	0.38	13.94	14.60	3.55	2.23	8.48	19.90	4.18	2.81	5.84
9.40	1.31	0.41	15.35	14.70	3.57	2.24	8.42	20.00	**4.19**	**2.82**	5.79
9.50	1.36	0.44	16.91	14.80	3.58	2.26	8.37				
9.60	1.44	0.49	18.71	14.90	3.60	2.27	8.32				
9.70	1.55	0.57	22.39	15.00	3.61	2.28	8.28				
9.80	1.75	0.71	31.34	15.10	3.62	2.29	8.23				
9.90	2.08	0.97	49.77	15.20	3.64	2.31	8.18				
10.00	2.32	1.16	84.61	15.30	3.65	2.32	8.14				
10.10	2.39	1.22	**112.97**	15.40	3.66	2.33	8.09				
10.20	2.46	1.28	102.88	15.50	3.68	2.34	8.04				

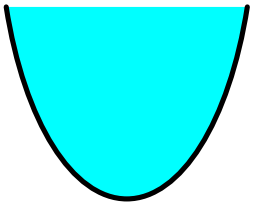
Summary for Reach 3R: D-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 4.51" for 100 yr event
Inflow = 282.25 cfs @ 9.87 hrs, Volume= 24.047 af
Outflow = 281.69 cfs @ 9.87 hrs, Volume= 24.043 af, Atten= 0%, Lag= 0.1 min

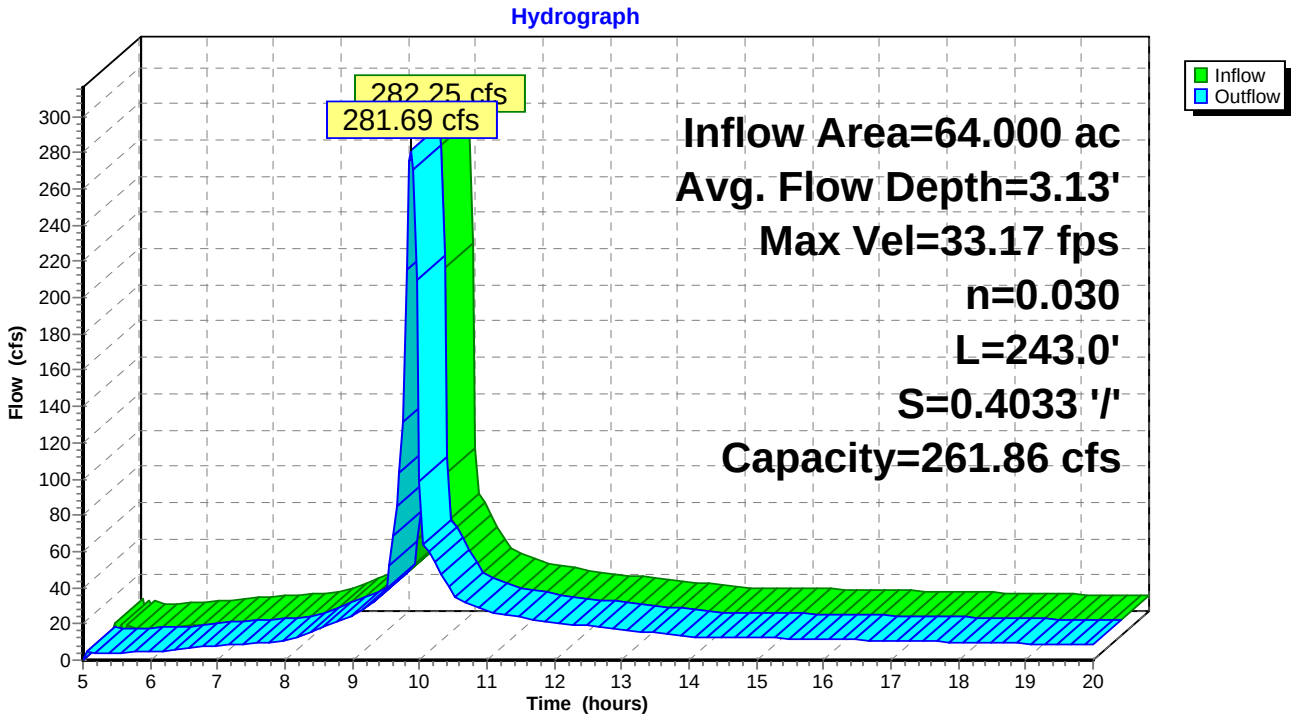
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 33.17 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 16.01 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2,067 cf @ 9.87 hrs
Average Depth at Peak Storage= 3.13' , Surface Width= 4.08'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 261.86 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 243.0' Slope= 0.4033 '/'
Inlet Invert= 727.00', Outlet Invert= 629.00'



Reach 3R: D-3



Hydrograph for Reach 3R: D-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	727.00	0.00
5.25	5.40	80	727.36	3.61
5.50	3.44	95	727.40	4.53
5.75	4.84	90	727.39	4.26
6.00	4.62	100	727.41	4.90
6.25	5.65	108	727.44	5.49
6.50	6.37	121	727.47	6.42
6.75	7.34	133	727.50	7.28
7.00	8.25	146	727.53	8.25
7.25	8.84	153	727.55	8.82
7.50	9.38	160	727.57	9.37
7.75	9.93	166	727.58	9.91
8.00	10.52	173	727.60	10.50
8.25	13.62	209	727.68	13.55
8.50	17.06	247	727.76	16.98
8.75	20.50	283	727.83	20.44
9.00	24.22	320	727.90	24.14
9.25	30.79	383	728.01	30.66
9.50	39.60	460	728.15	39.25
9.75	**134.56**	**1,154**	**729.12**	**131.74**
10.00	**90.29**	**889**	**728.78**	**98.91**
10.25	51.17	557	728.30	51.04
10.50	35.49	427	728.09	35.70
10.75	30.51	382	728.01	30.76
11.00	26.83	345	727.95	26.74
11.25	25.06	330	727.92	25.21
11.50	23.74	315	727.89	23.68
11.75	22.15	301	727.86	22.24
12.00	20.72	285	727.83	20.71
12.25	19.73	276	727.82	19.77
12.50	18.82	266	727.80	18.82
12.75	17.86	256	727.78	17.88
13.00	16.91	246	727.76	16.93
13.25	15.95	236	727.73	15.97
13.50	14.99	225	727.71	15.01
13.75	14.02	214	727.69	14.04
14.00	13.07	204	727.67	13.08
14.25	12.85	201	727.66	12.86
14.50	12.67	199	727.66	12.67
14.75	12.48	197	727.65	12.49
15.00	12.30	195	727.65	12.30
15.25	12.11	192	727.64	12.11
15.50	11.92	190	727.64	11.93
15.75	11.73	188	727.63	11.74
16.00	11.54	186	727.63	11.55
16.25	11.35	184	727.62	11.36
16.50	11.16	181	727.62	11.17
16.75	10.97	179	727.61	10.97
17.00	10.78	177	727.61	10.78
17.25	10.59	174	727.60	10.59
17.50	10.39	172	727.60	10.40
17.75	10.20	170	727.59	10.20
18.00	10.00	167	727.58	10.01
18.25	9.81	165	727.58	9.81
18.50	9.61	163	727.57	9.62
18.75	9.42	160	727.57	9.42
19.00	9.22	158	727.56	9.23
19.25	9.03	155	727.56	9.03
19.50	8.83	153	727.55	8.84
19.75	8.63	150	727.54	8.64
20.00	8.44	148	727.54	8.44

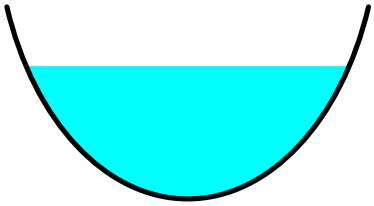
Summary for Reach C-1: D-2

Inflow Area = 38.400 ac, 0.00% Impervious, Inflow Depth > 3.10" for 100 yr event
Inflow = 74.79 cfs @ 10.13 hrs, Volume= 9.933 af
Outflow = 74.12 cfs @ 10.15 hrs, Volume= 9.919 af, Atten= 1%, Lag= 1.3 min

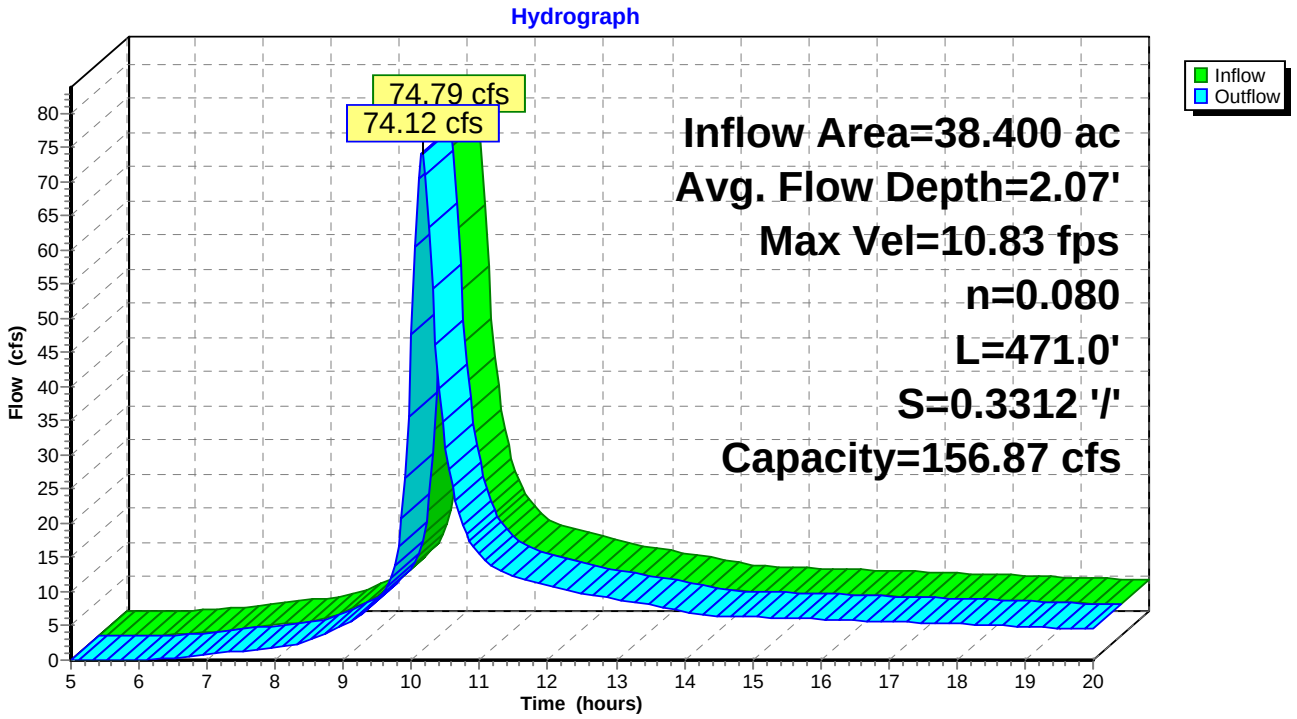
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.83 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 5.36 fps, Avg. Travel Time= 1.5 min

Peak Storage= 3,250 cf @ 10.14 hrs
Average Depth at Peak Storage= 2.07' , Surface Width= 4.99'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 156.87 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 471.0' Slope= 0.3312 '/'
Inlet Invert= 1,641.00', Outlet Invert= 1,485.00'



Reach C-1: D-2



Hydrograph for Reach C-1: D-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	1,641.00	0.00
5.25	0.00	0	1,641.00	0.00
5.50	0.00	0	1,641.00	0.00
5.75	0.01	1	1,641.00	0.00
6.00	0.09	19	1,641.07	0.05
6.25	0.22	46	1,641.12	0.18
6.50	0.39	71	1,641.16	0.35
6.75	0.60	98	1,641.20	0.56
7.00	0.86	127	1,641.24	0.81
7.25	1.14	157	1,641.28	1.10
7.50	1.42	184	1,641.31	1.38
7.75	1.69	209	1,641.33	1.65
8.00	1.97	233	1,641.36	1.93
8.25	2.31	260	1,641.39	2.25
8.50	3.06	316	1,641.44	2.94
8.75	4.12	391	1,641.51	3.98
9.00	5.37	474	1,641.57	5.21
9.25	6.90	567	1,641.65	6.69
9.50	9.20	697	1,641.74	8.91
9.75	14.98	969	1,641.93	13.80
10.00	**53.38**	**2,438**	**1,642.71**	**47.59**
10.25	**59.52**	**2,806**	**1,642.88**	**63.37**
10.50	29.54	1,670	1,642.33	31.11
10.75	19.14	1,212	1,642.08	19.84
11.00	15.09	1,015	1,641.95	15.37
11.25	13.13	915	1,641.89	13.28
11.50	12.14	864	1,641.86	12.22
11.75	11.47	829	1,641.83	11.54
12.00	10.83	795	1,641.81	10.90
12.25	10.20	762	1,641.79	10.26
12.50	9.72	735	1,641.77	9.77
12.75	9.30	712	1,641.75	9.34
13.00	8.87	689	1,641.74	8.92
13.25	8.44	665	1,641.72	8.49
13.50	8.00	640	1,641.70	8.05
13.75	7.55	614	1,641.68	7.60
14.00	7.09	587	1,641.66	7.14
14.25	6.67	561	1,641.64	6.71
14.50	6.48	549	1,641.63	6.49
14.75	6.38	543	1,641.63	6.39
15.00	6.30	538	1,641.63	6.31
15.25	6.22	534	1,641.62	6.23
15.50	6.14	529	1,641.62	6.15
15.75	6.06	524	1,641.61	6.07
16.00	5.98	518	1,641.61	5.99
16.25	5.89	513	1,641.61	5.90
16.50	5.81	508	1,641.60	5.82
16.75	5.72	503	1,641.60	5.73
17.00	5.63	497	1,641.59	5.64
17.25	5.54	491	1,641.59	5.56
17.50	5.45	486	1,641.58	5.47
17.75	5.36	480	1,641.58	5.38
18.00	5.27	474	1,641.57	5.28
18.25	5.18	468	1,641.57	5.19
18.50	5.09	462	1,641.57	5.10
18.75	5.00	456	1,641.56	5.01
19.00	4.90	450	1,641.56	4.91
19.25	4.81	444	1,641.55	4.82
19.50	4.71	438	1,641.54	4.72
19.75	4.61	431	1,641.54	4.63
20.00	4.52	425	1,641.53	4.53

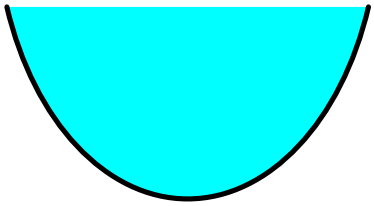
Summary for Reach C-2: D-2

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 3.97" for 100 yr event
Inflow = 256.96 cfs @ 10.13 hrs, Volume= 33.839 af
Outflow = 256.72 cfs @ 10.13 hrs, Volume= 33.829 af, Atten= 0%, Lag= 0.1 min

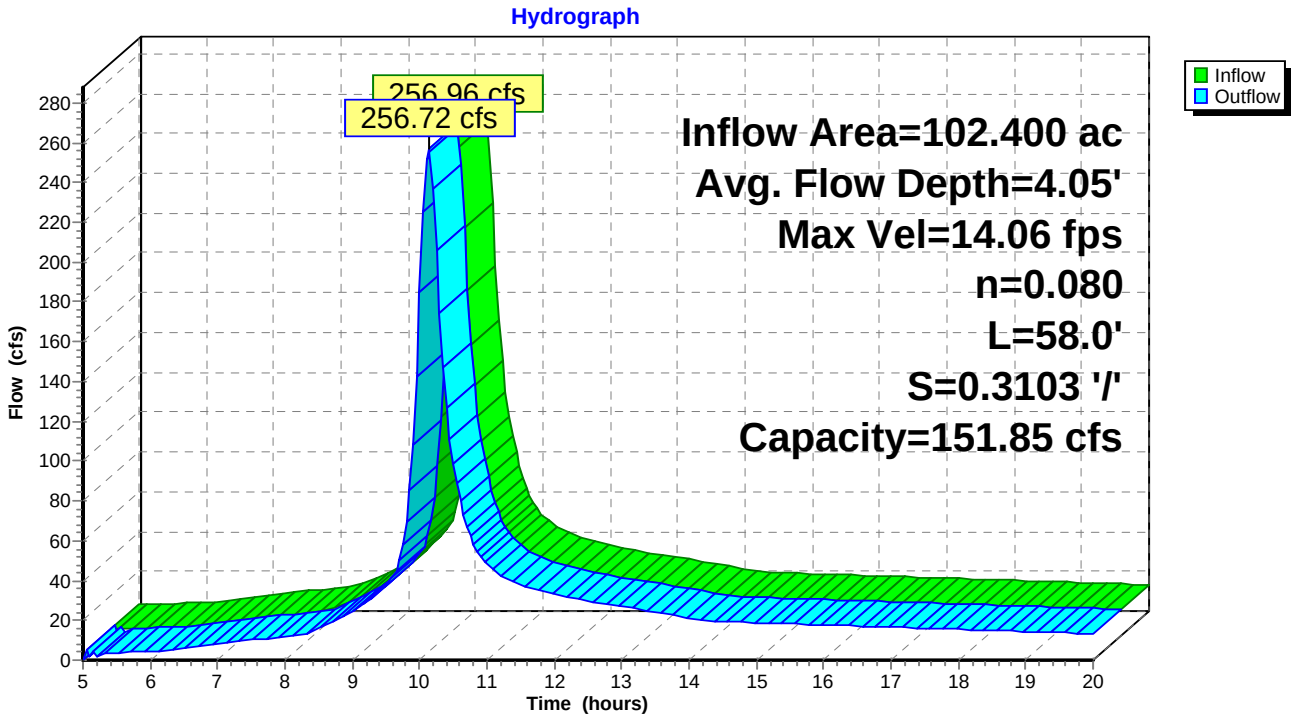
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.06 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 7.44 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1,059 cf @ 10.13 hrs
Average Depth at Peak Storage= 4.05' , Surface Width= 6.97'
Bank-Full Depth= 3.00' Flow Area= 12.0 sf, Capacity= 151.85 cfs

6.00' x 3.00' deep Parabolic Channel, n= 0.080 Earth, long dense weeds
Length= 58.0' Slope= 0.3103 '/'
Inlet Invert= 619.00', Outlet Invert= 601.00'



Reach C-2: D-2



Hydrograph for Reach C-2: D-2

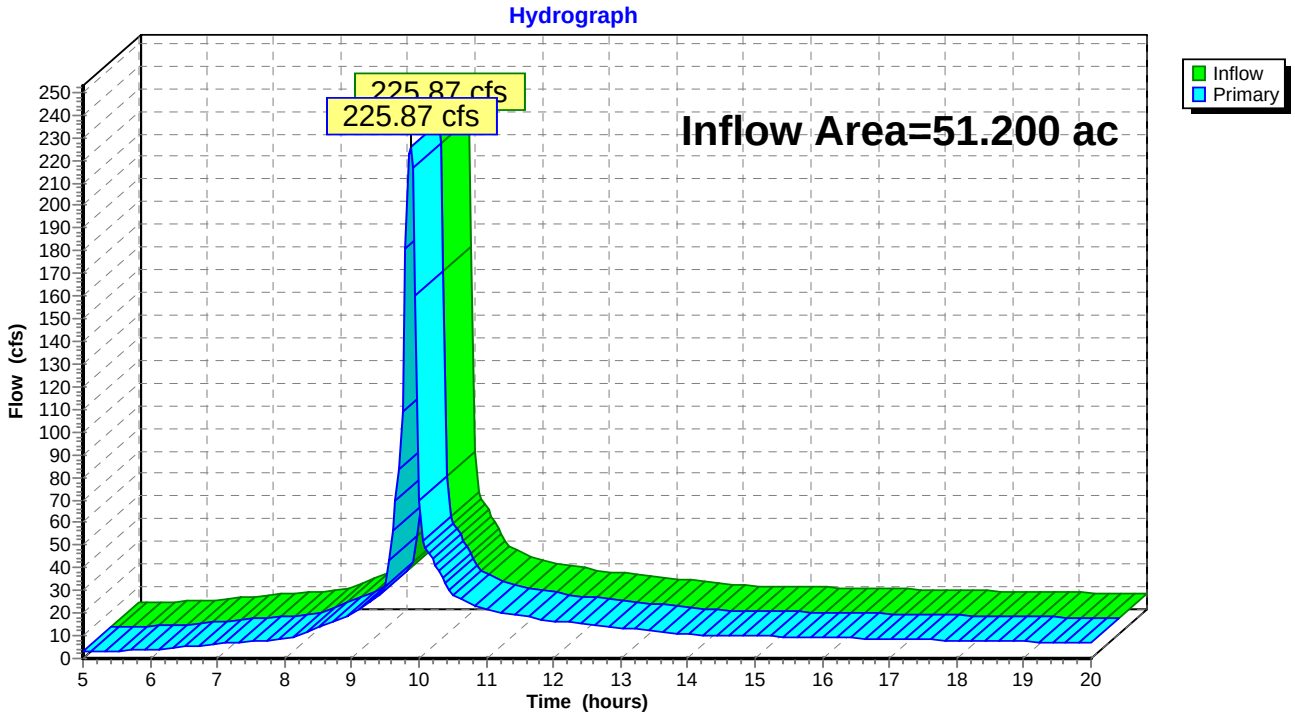
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	3.12	0	619.00	0.00
5.25	3.46	53	619.54	4.45
5.50	3.78	44	619.47	3.41
5.75	4.11	51	619.53	4.24
6.00	4.47	53	619.54	4.41
6.25	4.95	57	619.57	4.97
6.50	5.77	64	619.61	5.75
6.75	6.79	71	619.66	6.78
7.00	7.92	80	619.71	7.91
7.25	9.11	88	619.76	9.10
7.50	10.07	95	619.79	10.06
7.75	10.91	100	619.83	10.90
8.00	11.73	106	619.85	11.72
8.25	12.86	113	619.89	12.84
8.50	15.99	132	619.99	15.95
8.75	20.27	157	620.11	20.22
9.00	24.93	183	620.23	24.88
9.25	30.33	211	620.35	30.26
9.50	38.36	250	620.52	38.27
9.75	58.18	340	620.86	57.77
10.00	**186.26**	**812**	**622.33**	**184.43**
10.25	**204.97**	**882**	**622.53**	**206.31**
10.50	98.04	503	621.41	98.56
10.75	61.84	357	620.92	62.05
11.00	47.85	295	620.69	47.94
11.25	41.23	264	620.57	41.27
11.50	37.85	248	620.51	37.88
11.75	35.58	237	620.46	35.60
12.00	33.43	227	620.42	33.45
12.25	31.35	216	620.38	31.37
12.50	29.76	208	620.34	29.77
12.75	28.37	201	620.31	28.38
13.00	26.99	194	620.28	27.01
13.25	25.61	187	620.25	25.63
13.50	24.21	179	620.21	24.23
13.75	22.80	171	620.18	22.82
14.00	21.38	164	620.14	21.40
14.25	20.06	156	620.11	20.07
14.50	19.43	153	620.09	19.44
14.75	19.11	151	620.08	19.11
15.00	18.84	149	620.07	18.84
15.25	18.57	148	620.07	18.58
15.50	18.30	146	620.06	18.31
15.75	18.03	145	620.05	18.04
16.00	17.76	143	620.04	17.77
16.25	17.49	141	620.04	17.49
16.50	17.21	140	620.03	17.22
16.75	16.94	138	620.02	16.94
17.00	16.66	136	620.01	16.66
17.25	16.38	135	620.00	16.38
17.50	16.09	133	620.00	16.10
17.75	15.81	131	619.99	15.81
18.00	15.53	130	619.98	15.53
18.25	15.24	128	619.97	15.24
18.50	14.95	126	619.96	14.96
18.75	14.67	124	619.95	14.67
19.00	14.37	123	619.94	14.38
19.25	14.09	121	619.93	14.09
19.50	13.79	119	619.92	13.80
19.75	13.50	117	619.91	13.50
20.00	13.21	115	619.91	13.21

Summary for Pond D-1 Arroyo Trabuco: Free Flow

Inflow Area = 51.200 ac, 38.00% Impervious, Inflow Depth > 4.51" for 100 yr event
Inflow = 225.87 cfs @ 9.87 hrs, Volume= 19.245 af
Primary = 225.87 cfs @ 9.87 hrs, Volume= 19.245 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D-1 Arroyo Trabuco: Free Flow



Hydrograph for Pond D-1 Arroyo Trabuco: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	2.83		2.83
5.25	3.09		3.09
5.50	3.34		3.34
5.75	3.59		3.59
6.00	3.84		3.84
6.25	4.46		4.46
6.50	5.14		5.14
6.75	5.86		5.86
7.00	6.62		6.62
7.25	7.07		7.07
7.50	7.51		7.51
7.75	7.94		7.94
8.00	8.42		8.42
8.25	10.92		10.92
8.50	13.67		13.67
8.75	16.43		16.43
9.00	19.40		19.40
9.25	24.68		24.68
9.50	31.80		31.80
9.75	**108.70**		**108.70**
10.00	**69.50**		**69.50**
10.25	41.22		41.22
10.50	28.05		28.05
10.75	24.56		24.56
11.00	21.33		21.33
11.25	20.11		20.11
11.50	18.93		18.93
11.75	17.74		17.74
12.00	16.55		16.55
12.25	15.79		15.79
12.50	15.04		15.04
12.75	14.28		14.28
13.00	13.52		13.52
13.25	12.75		12.75
13.50	11.98		11.98
13.75	11.21		11.21
14.00	10.45		10.45
14.25	10.28		10.28
14.50	10.14		10.14
14.75	9.99		9.99
15.00	9.84		9.84
15.25	9.69		9.69
15.50	9.54		9.54
15.75	9.39		9.39
16.00	9.23		9.23
16.25	9.08		9.08
16.50	8.93		8.93
16.75	8.77		8.77
17.00	8.62		8.62
17.25	8.47		8.47
17.50	8.31		8.31
17.75	8.16		8.16
18.00	8.00		8.00
18.25	7.85		7.85
18.50	7.69		7.69
18.75	7.53		7.53
19.00	7.38		7.38
19.25	7.22		7.22
19.50	7.06		7.06
19.75	6.91		6.91
20.00	6.75		6.75

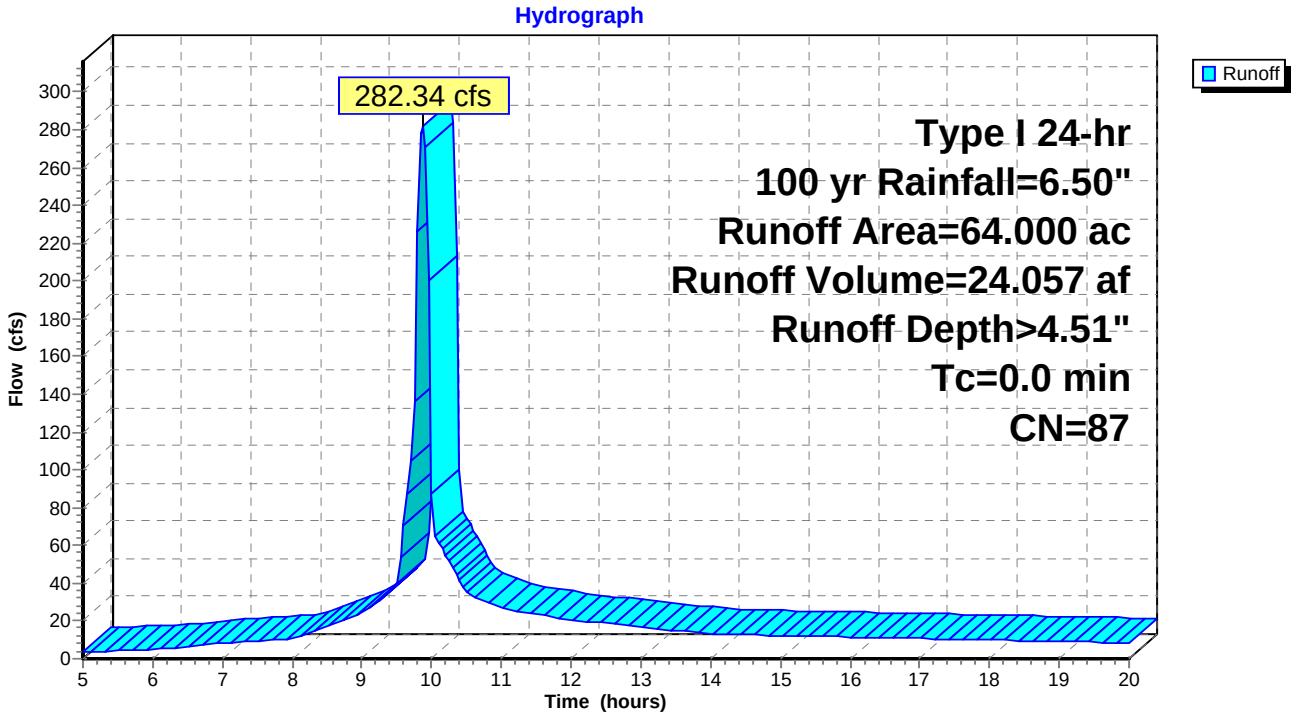
Summary for Subcatchment D-3: D-3

Runoff = 282.34 cfs @ 9.87 hrs, Volume= 24.057 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 100 yr Rainfall=6.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Subcatchment D-3: D-3



Hydrograph for Subcatchment D-3: D-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.65	0.07	3.54	10.30	3.65	2.32	48.20	15.60	5.33	3.88	11.84
5.10	0.67	0.07	3.67	10.40	3.72	2.39	41.50	15.70	5.35	3.90	11.77
5.20	0.68	0.08	3.80	10.50	3.79	2.44	35.07	15.80	5.37	3.92	11.69
5.30	0.70	0.08	3.93	10.60	3.85	2.50	33.14	15.90	5.39	3.94	11.62
5.40	0.71	0.09	4.05	10.70	3.90	2.55	31.52	16.00	5.41	3.95	11.54
5.50	0.73	0.10	4.18	10.80	3.95	2.59	29.89	16.10	5.43	3.97	11.47
5.60	0.75	0.10	4.30	10.90	4.00	2.64	28.25	16.20	5.45	3.99	11.39
5.70	0.76	0.11	4.43	11.00	4.05	2.68	26.66	16.30	5.46	4.01	11.31
5.80	0.78	0.12	4.55	11.10	4.09	2.72	26.02	16.40	5.48	4.02	11.24
5.90	0.80	0.12	4.67	11.20	4.14	2.76	25.43	16.50	5.50	4.04	11.16
6.00	0.81	0.13	4.80	11.30	4.18	2.80	24.85	16.60	5.52	4.06	11.08
6.10	0.83	0.14	5.10	11.40	4.22	2.84	24.26	16.70	5.54	4.08	11.01
6.20	0.85	0.15	5.41	11.50	4.26	2.88	23.67	16.80	5.55	4.09	10.93
6.30	0.87	0.16	5.74	11.60	4.30	2.91	23.07	16.90	5.57	4.11	10.85
6.40	0.88	0.16	6.07	11.70	4.34	2.95	22.48	17.00	5.59	4.13	10.78
6.50	0.90	0.17	6.42	11.80	4.38	2.98	21.88	17.10	5.61	4.14	10.70
6.60	0.92	0.18	6.77	11.90	4.41	3.02	21.28	17.20	5.62	4.16	10.62
6.70	0.95	0.20	7.14	12.00	4.45	3.05	20.69	17.30	5.64	4.18	10.55
6.80	0.97	0.21	7.51	12.10	4.48	3.08	20.30	17.40	5.66	4.19	10.47
6.90	0.99	0.22	7.89	12.20	4.51	3.11	19.93	17.50	5.68	4.21	10.39
7.00	1.01	0.23	8.27	12.30	4.55	3.14	19.55	17.60	5.69	4.22	10.31
7.10	1.04	0.24	8.51	12.40	4.58	3.17	19.18	17.70	5.71	4.24	10.24
7.20	1.06	0.26	8.73	12.50	4.61	3.20	18.80	17.80	5.73	4.26	10.16
7.30	1.09	0.27	8.95	12.60	4.64	3.23	18.42	17.90	5.74	4.27	10.08
7.40	1.11	0.29	9.17	12.70	4.67	3.26	18.04	18.00	5.76	4.29	10.00
7.50	1.13	0.30	9.39	12.80	4.70	3.29	17.66	18.10	5.78	4.30	9.92
7.60	1.16	0.31	9.60	12.90	4.73	3.31	17.28	18.20	5.79	4.32	9.85
7.70	1.18	0.33	9.82	13.00	4.76	3.34	16.90	18.30	5.81	4.33	9.77
7.80	1.21	0.35	10.04	13.10	4.79	3.37	16.52	18.40	5.82	4.35	9.69
7.90	1.24	0.36	10.25	13.20	4.81	3.39	16.13	18.50	5.84	4.36	9.61
8.00	1.26	0.38	10.53	13.30	4.84	3.42	15.75	18.60	5.85	4.38	9.53
8.10	1.29	0.39	11.71	13.40	4.86	3.44	15.36	18.70	5.87	4.39	9.46
8.20	1.32	0.41	13.00	13.50	4.89	3.46	14.98	18.80	5.88	4.41	9.38
8.30	1.35	0.43	14.32	13.60	4.91	3.49	14.59	18.90	5.90	4.42	9.30
8.40	1.39	0.46	15.68	13.70	4.94	3.51	14.20	19.00	5.92	4.44	9.22
8.50	1.42	0.48	17.08	13.80	4.96	3.53	13.82	19.10	5.93	4.45	9.14
8.60	1.46	0.51	18.44	13.90	4.98	3.55	13.43	19.20	5.94	4.46	9.06
8.70	1.51	0.54	19.83	14.00	5.01	3.57	13.06	19.30	5.96	4.48	8.99
8.80	1.55	0.57	21.25	14.10	5.03	3.59	12.96	19.40	5.97	4.49	8.91
8.90	1.60	0.61	22.70	14.20	5.05	3.61	12.89	19.50	5.99	4.51	8.83
9.00	1.65	0.64	24.26	14.30	5.07	3.63	12.82	19.60	6.00	4.52	8.75
9.10	1.71	0.68	26.80	14.40	5.09	3.65	12.74	19.70	6.02	4.53	8.67
9.20	1.76	0.73	29.48	14.50	5.11	3.67	12.67	19.80	6.03	4.55	8.59
9.30	1.83	0.77	32.23	14.60	5.13	3.69	12.59	19.90	6.04	4.56	8.51
9.40	1.90	0.83	35.05	14.70	5.15	3.71	12.52	20.00	**6.06**	**4.57**	8.43
9.50	1.97	0.88	39.75	14.80	5.17	3.73	12.45				
9.60	2.08	0.97	70.42	14.90	5.19	3.75	12.37				
9.70	2.25	1.10	104.77	15.00	5.21	3.77	12.30				
9.80	2.52	1.33	**226.55**	15.10	5.23	3.79	12.22				
9.90	3.01	1.75	**270.70**	15.20	5.25	3.81	12.15				
10.00	3.35	2.05	86.88	15.30	5.27	3.82	12.07				
10.10	3.46	2.15	61.33	15.40	5.29	3.84	12.00				
10.20	3.56	2.24	54.81	15.50	5.31	3.86	11.92				

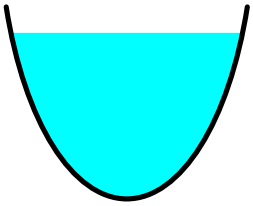
Summary for Reach D-3 split: C-3

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 4.51" for 100 yr event
Inflow = 282.34 cfs @ 9.87 hrs, Volume= 24.057 af
Outflow = 282.25 cfs @ 9.87 hrs, Volume= 24.047 af, Atten= 0%, Lag= 0.0 min

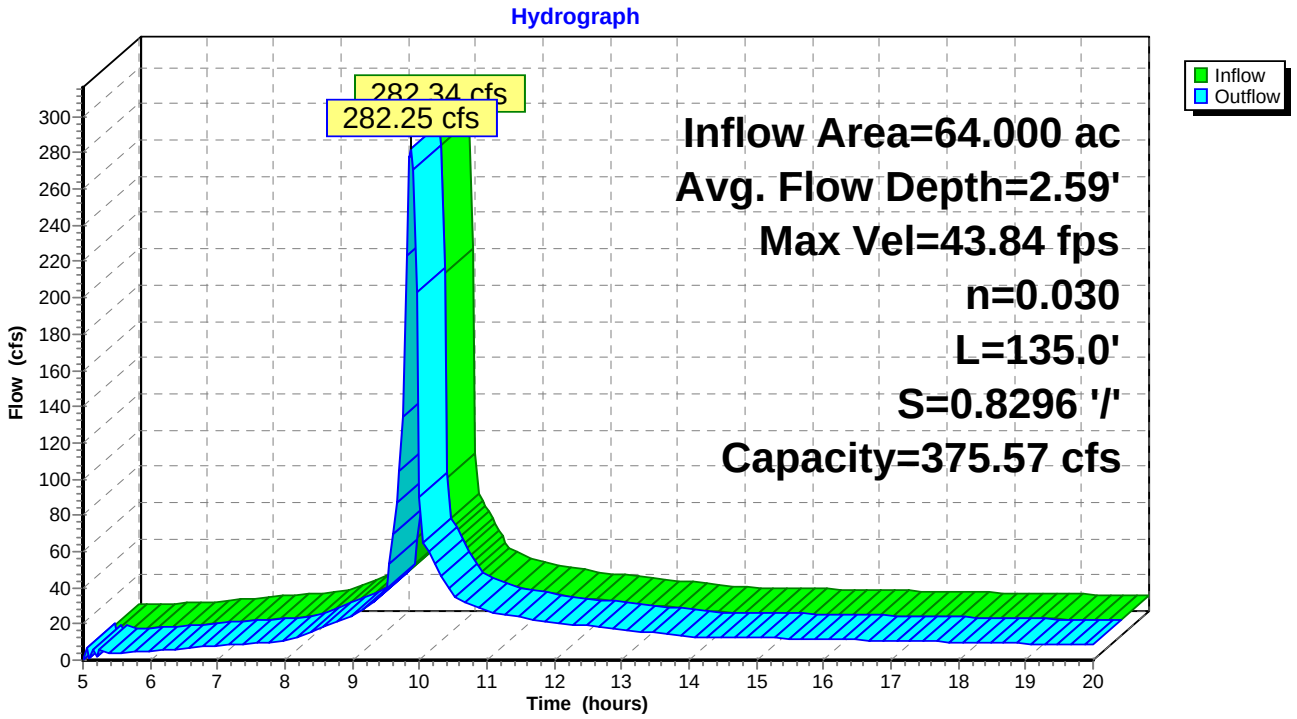
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 43.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 20.86 fps, Avg. Travel Time= 0.1 min

Peak Storage= 868 cf @ 9.87 hrs
Average Depth at Peak Storage= 2.59' , Surface Width= 3.72'
Bank-Full Depth= 3.00' Flow Area= 8.0 sf, Capacity= 375.57 cfs

4.00' x 3.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 135.0' Slope= 0.8296 '/'
Inlet Invert= 727.00', Outlet Invert= 615.00'



Reach D-3 split: C-3



Hydrograph for Reach D-3 split: C-3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	3.54	0	727.00	0.00
5.25	3.86	46	727.37	5.40
5.50	4.18	33	727.29	3.44
5.75	4.49	42	727.35	4.84
6.00	4.80	41	727.34	4.62
6.25	5.57	47	727.37	5.65
6.50	6.42	52	727.39	6.37
6.75	7.32	57	727.42	7.34
7.00	8.27	62	727.45	8.25
7.25	8.84	65	727.46	8.84
7.50	9.39	68	727.48	9.38
7.75	9.93	71	727.49	9.93
8.00	10.53	74	727.50	10.52
8.25	13.65	90	727.57	13.62
8.50	17.08	106	727.64	17.06
8.75	20.53	121	727.70	20.50
9.00	24.26	137	727.76	24.22
9.25	30.85	163	727.85	30.79
9.50	39.75	196	727.96	39.60
9.75	**135.87**	**493**	**728.78**	**134.56**
10.00	**86.88**	**358**	**728.44**	**90.29**
10.25	51.52	237	728.09	51.17
10.50	35.07	181	727.91	35.49
10.75	30.70	162	727.85	30.51
11.00	26.66	147	727.79	26.83
11.25	25.14	140	727.77	25.06
11.50	23.67	134	727.75	23.74
11.75	22.18	128	727.72	22.15
12.00	20.69	122	727.70	20.72
12.25	19.74	117	727.68	19.73
12.50	18.80	113	727.67	18.82
12.75	17.85	109	727.65	17.86
13.00	16.90	105	727.63	16.91
13.25	15.94	100	727.62	15.95
13.50	14.98	96	727.60	14.99
13.75	14.01	91	727.58	14.02
14.00	13.06	87	727.56	13.07
14.25	12.85	86	727.55	12.85
14.50	12.67	85	727.55	12.67
14.75	12.48	84	727.55	12.48
15.00	12.30	83	727.54	12.30
15.25	12.11	82	727.54	12.11
15.50	11.92	81	727.53	11.92
15.75	11.73	80	727.53	11.73
16.00	11.54	79	727.53	11.54
16.25	11.35	78	727.52	11.35
16.50	11.16	77	727.52	11.16
16.75	10.97	76	727.51	10.97
17.00	10.78	75	727.51	10.78
17.25	10.58	74	727.50	10.59
17.50	10.39	73	727.50	10.39
17.75	10.20	72	727.50	10.20
18.00	10.00	71	727.49	10.00
18.25	9.81	70	727.49	9.81
18.50	9.61	69	727.48	9.61
18.75	9.42	68	727.48	9.42
19.00	9.22	67	727.47	9.22
19.25	9.03	66	727.47	9.03
19.50	8.83	65	727.46	8.83
19.75	8.63	64	727.46	8.63
20.00	8.43	63	727.45	8.44

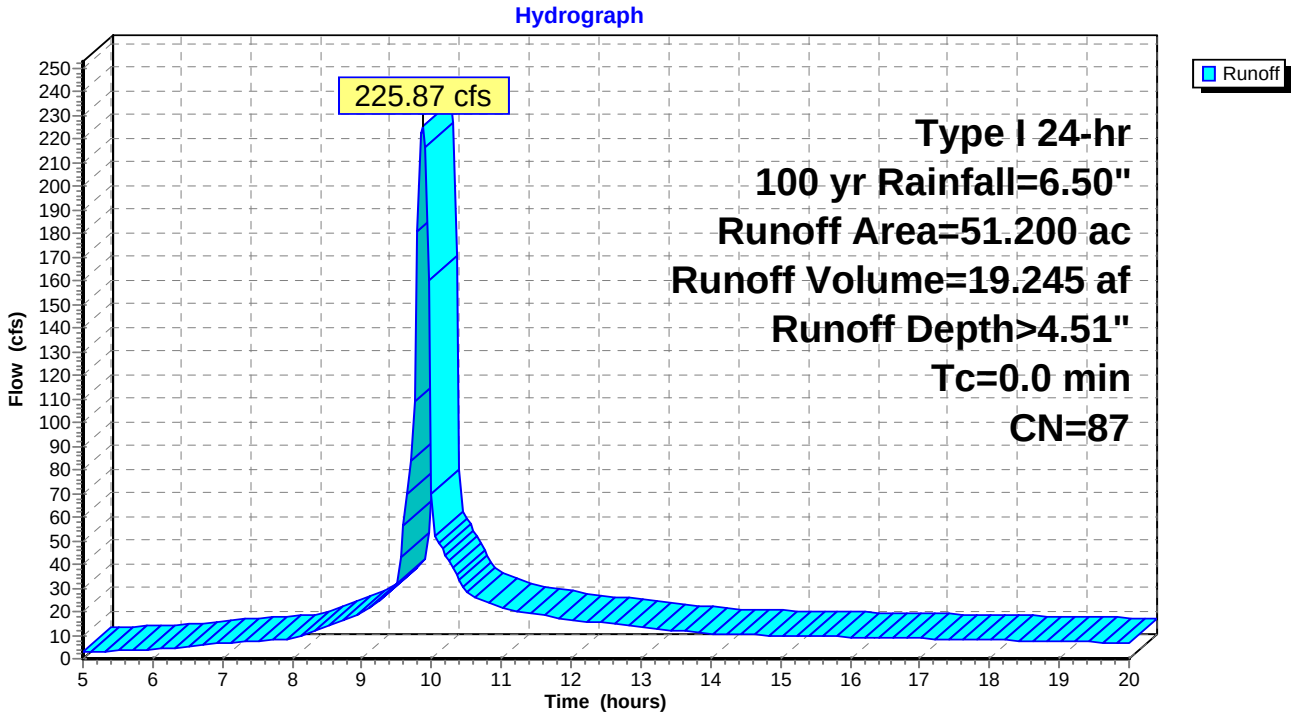
Summary for Subcatchment D1: D-1

Runoff = 225.87 cfs @ 9.87 hrs, Volume= 19.245 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 100 yr Rainfall=6.50"

Area (ac)	CN	Description
51.200	87	1/4 acre lots, 38% imp, HSG D
31.744		62.00% Pervious Area
19.456		38.00% Impervious Area

Subcatchment D1: D-1



Hydrograph for Subcatchment D1: D-1

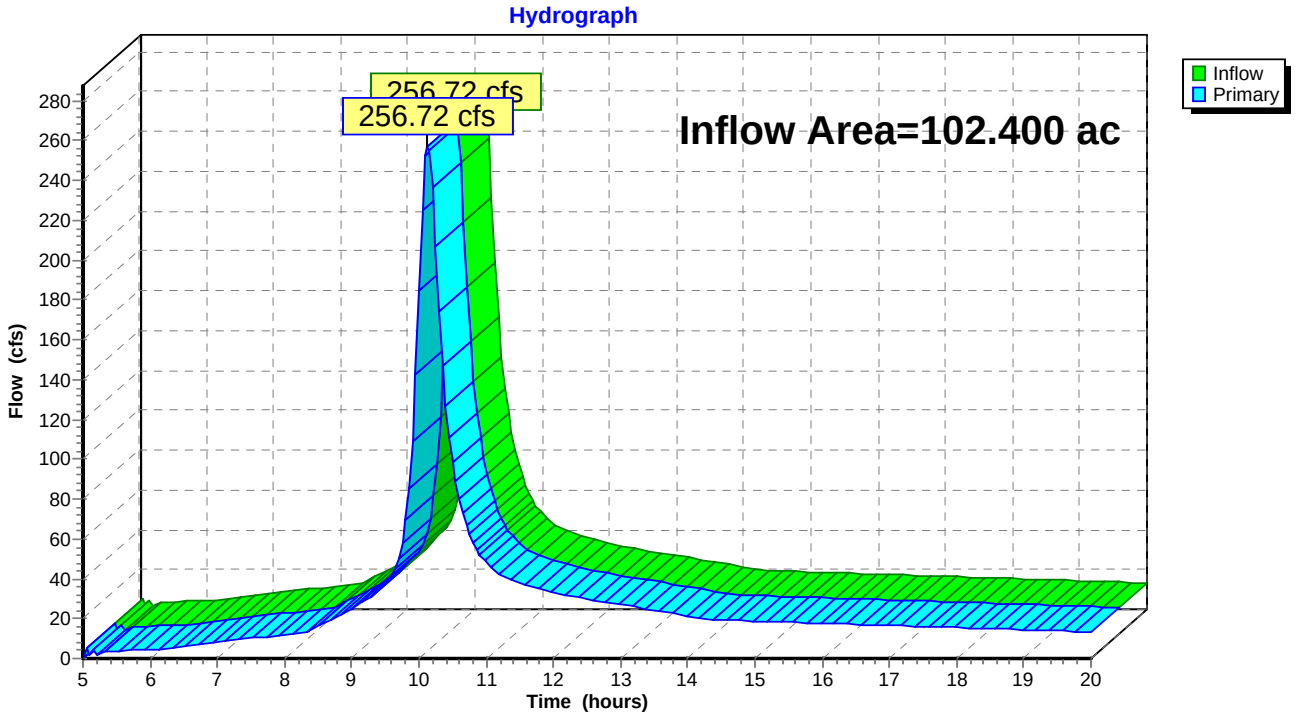
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.65	0.07	2.83	10.30	3.65	2.32	38.56	15.60	5.33	3.88	9.48
5.10	0.67	0.07	2.93	10.40	3.72	2.39	33.20	15.70	5.35	3.90	9.42
5.20	0.68	0.08	3.04	10.50	3.79	2.44	28.05	15.80	5.37	3.92	9.35
5.30	0.70	0.08	3.14	10.60	3.85	2.50	26.51	15.90	5.39	3.94	9.29
5.40	0.71	0.09	3.24	10.70	3.90	2.55	25.21	16.00	5.41	3.95	9.23
5.50	0.73	0.10	3.34	10.80	3.95	2.59	23.91	16.10	5.43	3.97	9.17
5.60	0.75	0.10	3.44	10.90	4.00	2.64	22.60	16.20	5.45	3.99	9.11
5.70	0.76	0.11	3.54	11.00	4.05	2.68	21.33	16.30	5.46	4.01	9.05
5.80	0.78	0.12	3.64	11.10	4.09	2.72	20.81	16.40	5.48	4.02	8.99
5.90	0.80	0.12	3.74	11.20	4.14	2.76	20.35	16.50	5.50	4.04	8.93
6.00	0.81	0.13	3.84	11.30	4.18	2.80	19.88	16.60	5.52	4.06	8.87
6.10	0.83	0.14	4.08	11.40	4.22	2.84	19.41	16.70	5.54	4.08	8.81
6.20	0.85	0.15	4.33	11.50	4.26	2.88	18.93	16.80	5.55	4.09	8.74
6.30	0.87	0.16	4.59	11.60	4.30	2.91	18.46	16.90	5.57	4.11	8.68
6.40	0.88	0.16	4.86	11.70	4.34	2.95	17.98	17.00	5.59	4.13	8.62
6.50	0.90	0.17	5.14	11.80	4.38	2.98	17.50	17.10	5.61	4.14	8.56
6.60	0.92	0.18	5.42	11.90	4.41	3.02	17.02	17.20	5.62	4.16	8.50
6.70	0.95	0.20	5.71	12.00	4.45	3.05	16.55	17.30	5.64	4.18	8.44
6.80	0.97	0.21	6.01	12.10	4.48	3.08	16.24	17.40	5.66	4.19	8.37
6.90	0.99	0.22	6.31	12.20	4.51	3.11	15.94	17.50	5.68	4.21	8.31
7.00	1.01	0.23	6.62	12.30	4.55	3.14	15.64	17.60	5.69	4.22	8.25
7.10	1.04	0.24	6.81	12.40	4.58	3.17	15.34	17.70	5.71	4.24	8.19
7.20	1.06	0.26	6.98	12.50	4.61	3.20	15.04	17.80	5.73	4.26	8.13
7.30	1.09	0.27	7.16	12.60	4.64	3.23	14.74	17.90	5.74	4.27	8.06
7.40	1.11	0.29	7.33	12.70	4.67	3.26	14.43	18.00	5.76	4.29	8.00
7.50	1.13	0.30	7.51	12.80	4.70	3.29	14.13	18.10	5.78	4.30	7.94
7.60	1.16	0.31	7.68	12.90	4.73	3.31	13.83	18.20	5.79	4.32	7.88
7.70	1.18	0.33	7.86	13.00	4.76	3.34	13.52	18.30	5.81	4.33	7.82
7.80	1.21	0.35	8.03	13.10	4.79	3.37	13.21	18.40	5.82	4.35	7.75
7.90	1.24	0.36	8.20	13.20	4.81	3.39	12.91	18.50	5.84	4.36	7.69
8.00	1.26	0.38	8.42	13.30	4.84	3.42	12.60	18.60	5.85	4.38	7.63
8.10	1.29	0.39	9.37	13.40	4.86	3.44	12.29	18.70	5.87	4.39	7.57
8.20	1.32	0.41	10.40	13.50	4.89	3.46	11.98	18.80	5.88	4.41	7.50
8.30	1.35	0.43	11.46	13.60	4.91	3.49	11.67	18.90	5.90	4.42	7.44
8.40	1.39	0.46	12.55	13.70	4.94	3.51	11.36	19.00	5.92	4.44	7.38
8.50	1.42	0.48	13.67	13.80	4.96	3.53	11.05	19.10	5.93	4.45	7.31
8.60	1.46	0.51	14.75	13.90	4.98	3.55	10.74	19.20	5.94	4.46	7.25
8.70	1.51	0.54	15.86	14.00	5.01	3.57	10.45	19.30	5.96	4.48	7.19
8.80	1.55	0.57	17.00	14.10	5.03	3.59	10.37	19.40	5.97	4.49	7.13
8.90	1.60	0.61	18.16	14.20	5.05	3.61	10.31	19.50	5.99	4.51	7.06
9.00	1.65	0.64	19.40	14.30	5.07	3.63	10.25	19.60	6.00	4.52	7.00
9.10	1.71	0.68	21.44	14.40	5.09	3.65	10.19	19.70	6.02	4.53	6.94
9.20	1.76	0.73	23.58	14.50	5.11	3.67	10.14	19.80	6.03	4.55	6.87
9.30	1.83	0.77	25.79	14.60	5.13	3.69	10.08	19.90	6.04	4.56	6.81
9.40	1.90	0.83	28.04	14.70	5.15	3.71	10.02	20.00	**6.06**	**4.57**	6.75
9.50	1.97	0.88	31.80	14.80	5.17	3.73	9.96				
9.60	2.08	0.97	56.34	14.90	5.19	3.75	9.90				
9.70	2.25	1.10	83.81	15.00	5.21	3.77	9.84				
9.80	2.52	1.33	**181.24**	15.10	5.23	3.79	9.78				
9.90	3.01	1.75	**216.56**	15.20	5.25	3.81	9.72				
10.00	3.35	2.05	69.50	15.30	5.27	3.82	9.66				
10.10	3.46	2.15	49.06	15.40	5.29	3.84	9.60				
10.20	3.56	2.24	43.85	15.50	5.31	3.86	9.54				

Summary for Pond D2 exit: Free flow

Inflow Area = 102.400 ac, 23.75% Impervious, Inflow Depth > 3.96" for 100 yr event
Inflow = 256.72 cfs @ 10.13 hrs, Volume= 33.829 af
Primary = 256.72 cfs @ 10.13 hrs, Volume= 33.829 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D2 exit: Free flow



Hydrograph for Pond D2 exit: Free flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00
5.25	4.45		4.45
5.50	3.41		3.41
5.75	4.24		4.24
6.00	4.41		4.41
6.25	4.97		4.97
6.50	5.75		5.75
6.75	6.78		6.78
7.00	7.91		7.91
7.25	9.10		9.10
7.50	10.06		10.06
7.75	10.90		10.90
8.00	11.72		11.72
8.25	12.84		12.84
8.50	15.95		15.95
8.75	20.22		20.22
9.00	24.88		24.88
9.25	30.26		30.26
9.50	38.27		38.27
9.75	57.77		57.77
10.00	**184.43**		**184.43**
10.25	**206.31**		**206.31**
10.50	98.56		98.56
10.75	62.05		62.05
11.00	47.94		47.94
11.25	41.27		41.27
11.50	37.88		37.88
11.75	35.60		35.60
12.00	33.45		33.45
12.25	31.37		31.37
12.50	29.77		29.77
12.75	28.38		28.38
13.00	27.01		27.01
13.25	25.63		25.63
13.50	24.23		24.23
13.75	22.82		22.82
14.00	21.40		21.40
14.25	20.07		20.07
14.50	19.44		19.44
14.75	19.11		19.11
15.00	18.84		18.84
15.25	18.58		18.58
15.50	18.31		18.31
15.75	18.04		18.04
16.00	17.77		17.77
16.25	17.49		17.49
16.50	17.22		17.22
16.75	16.94		16.94
17.00	16.66		16.66
17.25	16.38		16.38
17.50	16.10		16.10
17.75	15.81		15.81
18.00	15.53		15.53
18.25	15.24		15.24
18.50	14.96		14.96
18.75	14.67		14.67
19.00	14.38		14.38
19.25	14.09		14.09
19.50	13.80		13.80
19.75	13.50		13.50
20.00	13.21		13.21

Summary for Subcatchment D2-1: D2

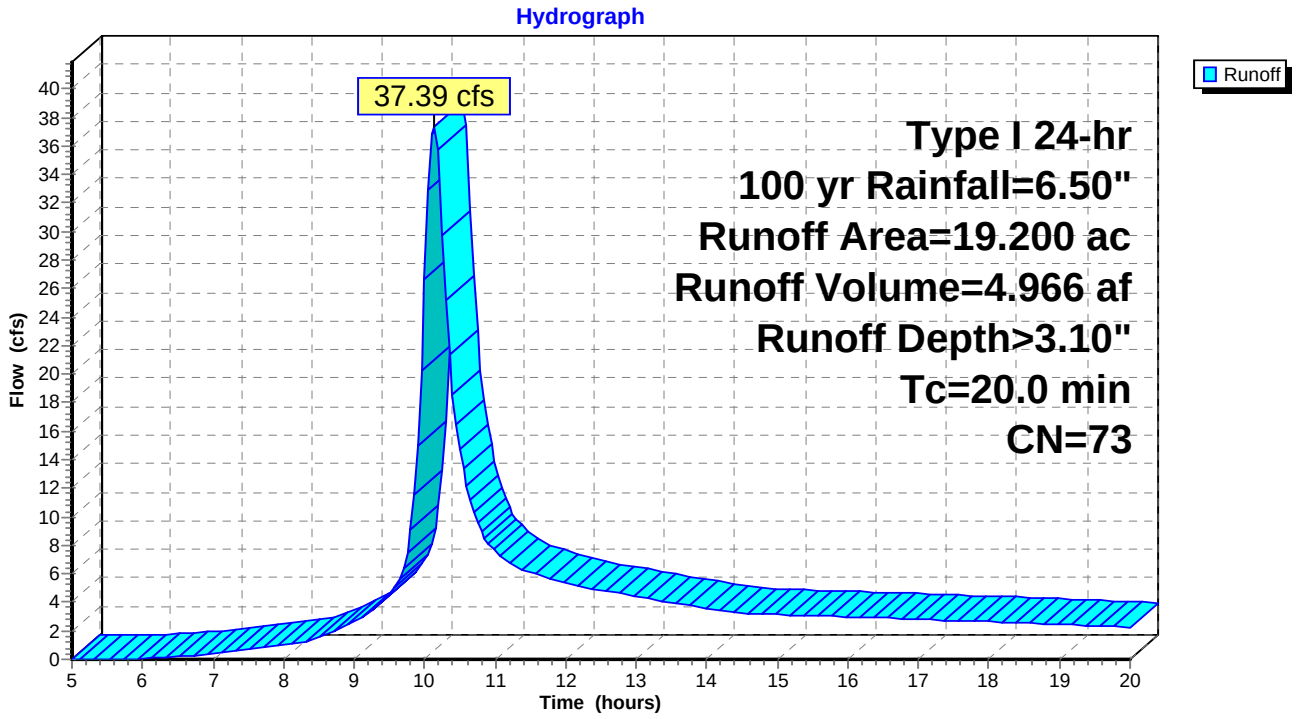
Runoff = 37.39 cfs @ 10.13 hrs, Volume= 4.966 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 100 yr Rainfall=6.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-1: D2



Hydrograph for Subcatchment D2-1: D2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.65	0.00	0.00	10.30	3.65	1.28	25.20	15.60	5.33	2.54	3.05
5.10	0.67	0.00	0.00	10.40	3.72	1.33	18.60	15.70	5.35	2.56	3.04
5.20	0.68	0.00	0.00	10.50	3.79	1.38	14.77	15.80	5.37	2.57	3.02
5.30	0.70	0.00	0.00	10.60	3.85	1.42	12.18	15.90	5.39	2.59	3.01
5.40	0.71	0.00	0.00	10.70	3.90	1.46	10.29	16.00	5.41	2.60	2.99
5.50	0.73	0.00	0.00	10.80	3.95	1.49	8.99	16.10	5.43	2.62	2.97
5.60	0.75	0.00	0.00	10.90	4.00	1.53	8.15	16.20	5.45	2.63	2.95
5.70	0.76	0.00	0.00	11.00	4.05	1.56	7.54	16.30	5.46	2.65	2.94
5.80	0.78	0.00	0.01	11.10	4.09	1.60	7.08	16.40	5.48	2.66	2.92
5.90	0.80	0.00	0.02	11.20	4.14	1.63	6.71	16.50	5.50	2.68	2.90
6.00	0.81	0.00	0.04	11.30	4.18	1.66	6.43	16.60	5.52	2.69	2.89
6.10	0.83	0.00	0.07	11.40	4.22	1.69	6.23	16.70	5.54	2.71	2.87
6.20	0.85	0.00	0.09	11.50	4.26	1.72	6.07	16.80	5.55	2.72	2.85
6.30	0.87	0.00	0.12	11.60	4.30	1.75	5.93	16.90	5.57	2.74	2.83
6.40	0.88	0.01	0.16	11.70	4.34	1.77	5.80	17.00	5.59	2.75	2.82
6.50	0.90	0.01	0.19	11.80	4.38	1.80	5.67	17.10	5.61	2.77	2.80
6.60	0.92	0.01	0.23	11.90	4.41	1.83	5.54	17.20	5.62	2.78	2.78
6.70	0.95	0.01	0.28	12.00	4.45	1.86	5.42	17.30	5.64	2.79	2.76
6.80	0.97	0.01	0.32	12.10	4.48	1.88	5.28	17.40	5.66	2.81	2.75
6.90	0.99	0.02	0.37	12.20	4.51	1.91	5.16	17.50	5.68	2.82	2.73
7.00	1.01	0.02	0.43	12.30	4.55	1.93	5.05	17.60	5.69	2.84	2.71
7.10	1.04	0.02	0.48	12.40	4.58	1.96	4.95	17.70	5.71	2.85	2.69
7.20	1.06	0.03	0.54	12.50	4.61	1.98	4.86	17.80	5.73	2.86	2.67
7.30	1.09	0.03	0.60	12.60	4.64	2.00	4.77	17.90	5.74	2.88	2.65
7.40	1.11	0.03	0.66	12.70	4.67	2.03	4.69	18.00	5.76	2.89	2.64
7.50	1.13	0.04	0.71	12.80	4.70	2.05	4.61	18.10	5.78	2.90	2.62
7.60	1.16	0.04	0.77	12.90	4.73	2.07	4.52	18.20	5.79	2.92	2.60
7.70	1.18	0.05	0.82	13.00	4.76	2.09	4.44	18.30	5.81	2.93	2.58
7.80	1.21	0.05	0.87	13.10	4.79	2.11	4.35	18.40	5.82	2.94	2.56
7.90	1.24	0.06	0.93	13.20	4.81	2.13	4.26	18.50	5.84	2.96	2.54
8.00	1.26	0.06	0.98	13.30	4.84	2.15	4.18	18.60	5.85	2.97	2.53
8.10	1.29	0.07	1.04	13.40	4.86	2.17	4.09	18.70	5.87	2.98	2.51
8.20	1.32	0.08	1.11	13.50	4.89	2.19	4.00	18.80	5.88	2.99	2.49
8.30	1.35	0.09	1.21	13.60	4.91	2.21	3.91	18.90	5.90	3.01	2.47
8.40	1.39	0.10	1.36	13.70	4.94	2.23	3.82	19.00	5.92	3.02	2.45
8.50	1.42	0.11	1.53	13.80	4.96	2.25	3.73	19.10	5.93	3.03	2.43
8.60	1.46	0.12	1.73	13.90	4.98	2.27	3.64	19.20	5.94	3.04	2.41
8.70	1.51	0.13	1.95	14.00	5.01	2.28	3.54	19.30	5.96	3.05	2.39
8.80	1.55	0.15	2.18	14.10	5.03	2.30	3.45	19.40	5.97	3.07	2.37
8.90	1.60	0.16	2.42	14.20	5.05	2.32	3.37	19.50	5.99	3.08	2.35
9.00	1.65	0.18	2.68	14.30	5.07	2.33	3.31	19.60	6.00	3.09	2.34
9.10	1.71	0.20	2.96	14.40	5.09	2.35	3.27	19.70	6.02	3.10	2.32
9.20	1.76	0.22	3.27	14.50	5.11	2.37	3.24	19.80	6.03	3.11	2.30
9.30	1.83	0.25	3.64	14.60	5.13	2.38	3.22	19.90	6.04	3.13	2.28
9.40	1.90	0.28	4.09	14.70	5.15	2.40	3.20	20.00	**6.06**	**3.14**	2.26
9.50	1.97	0.31	4.60	14.80	5.17	2.42	3.18				
9.60	2.08	0.35	5.19	14.90	5.19	2.43	3.17				
9.70	2.25	0.44	6.35	15.00	5.21	2.45	3.15				
9.80	2.52	0.58	9.14	15.10	5.23	2.46	3.14				
9.90	3.01	0.86	15.04	15.20	5.25	2.48	3.12				
10.00	3.35	1.08	26.69	15.30	5.27	2.50	3.10				
10.10	3.46	1.15	**36.82**	15.40	5.29	2.51	3.09				
10.20	3.56	1.22	**34.24**	15.50	5.31	2.53	3.07				

Summary for Subcatchment D2-2: D2

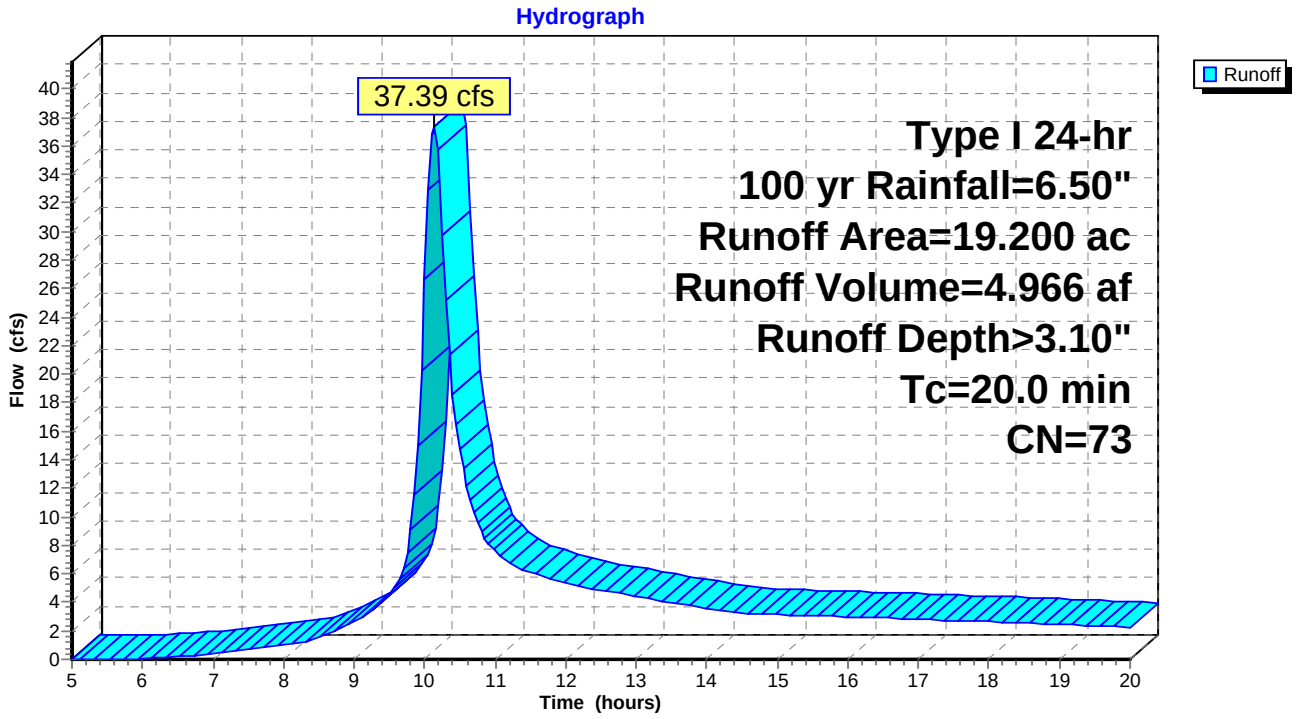
Runoff = 37.39 cfs @ 10.13 hrs, Volume= 4.966 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 100 yr Rainfall=6.50"

Area (ac)	CN	Description
19.200	73	Brush, Good, HSG D
19.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D2-2: D2



Hydrograph for Subcatchment D2-2: D2

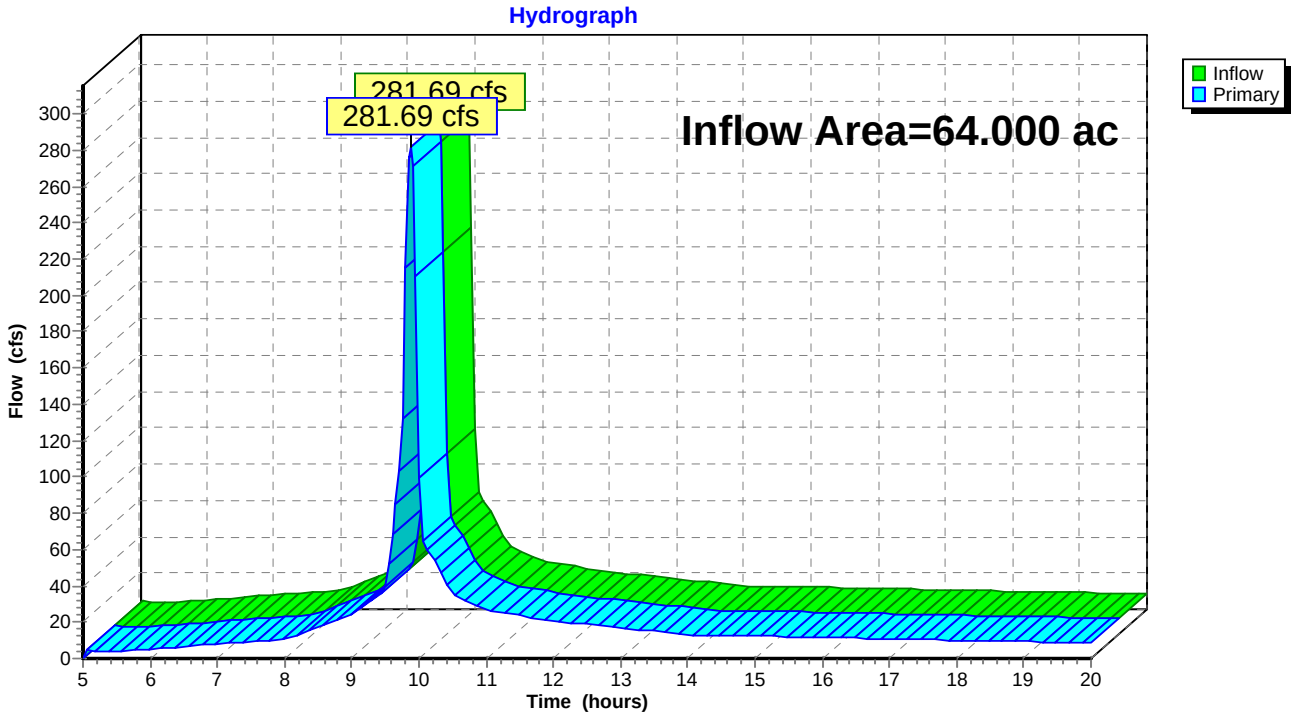
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.65	0.00	0.00	10.30	3.65	1.28	25.20	15.60	5.33	2.54	3.05
5.10	0.67	0.00	0.00	10.40	3.72	1.33	18.60	15.70	5.35	2.56	3.04
5.20	0.68	0.00	0.00	10.50	3.79	1.38	14.77	15.80	5.37	2.57	3.02
5.30	0.70	0.00	0.00	10.60	3.85	1.42	12.18	15.90	5.39	2.59	3.01
5.40	0.71	0.00	0.00	10.70	3.90	1.46	10.29	16.00	5.41	2.60	2.99
5.50	0.73	0.00	0.00	10.80	3.95	1.49	8.99	16.10	5.43	2.62	2.97
5.60	0.75	0.00	0.00	10.90	4.00	1.53	8.15	16.20	5.45	2.63	2.95
5.70	0.76	0.00	0.00	11.00	4.05	1.56	7.54	16.30	5.46	2.65	2.94
5.80	0.78	0.00	0.01	11.10	4.09	1.60	7.08	16.40	5.48	2.66	2.92
5.90	0.80	0.00	0.02	11.20	4.14	1.63	6.71	16.50	5.50	2.68	2.90
6.00	0.81	0.00	0.04	11.30	4.18	1.66	6.43	16.60	5.52	2.69	2.89
6.10	0.83	0.00	0.07	11.40	4.22	1.69	6.23	16.70	5.54	2.71	2.87
6.20	0.85	0.00	0.09	11.50	4.26	1.72	6.07	16.80	5.55	2.72	2.85
6.30	0.87	0.00	0.12	11.60	4.30	1.75	5.93	16.90	5.57	2.74	2.83
6.40	0.88	0.01	0.16	11.70	4.34	1.77	5.80	17.00	5.59	2.75	2.82
6.50	0.90	0.01	0.19	11.80	4.38	1.80	5.67	17.10	5.61	2.77	2.80
6.60	0.92	0.01	0.23	11.90	4.41	1.83	5.54	17.20	5.62	2.78	2.78
6.70	0.95	0.01	0.28	12.00	4.45	1.86	5.42	17.30	5.64	2.79	2.76
6.80	0.97	0.01	0.32	12.10	4.48	1.88	5.28	17.40	5.66	2.81	2.75
6.90	0.99	0.02	0.37	12.20	4.51	1.91	5.16	17.50	5.68	2.82	2.73
7.00	1.01	0.02	0.43	12.30	4.55	1.93	5.05	17.60	5.69	2.84	2.71
7.10	1.04	0.02	0.48	12.40	4.58	1.96	4.95	17.70	5.71	2.85	2.69
7.20	1.06	0.03	0.54	12.50	4.61	1.98	4.86	17.80	5.73	2.86	2.67
7.30	1.09	0.03	0.60	12.60	4.64	2.00	4.77	17.90	5.74	2.88	2.65
7.40	1.11	0.03	0.66	12.70	4.67	2.03	4.69	18.00	5.76	2.89	2.64
7.50	1.13	0.04	0.71	12.80	4.70	2.05	4.61	18.10	5.78	2.90	2.62
7.60	1.16	0.04	0.77	12.90	4.73	2.07	4.52	18.20	5.79	2.92	2.60
7.70	1.18	0.05	0.82	13.00	4.76	2.09	4.44	18.30	5.81	2.93	2.58
7.80	1.21	0.05	0.87	13.10	4.79	2.11	4.35	18.40	5.82	2.94	2.56
7.90	1.24	0.06	0.93	13.20	4.81	2.13	4.26	18.50	5.84	2.96	2.54
8.00	1.26	0.06	0.98	13.30	4.84	2.15	4.18	18.60	5.85	2.97	2.53
8.10	1.29	0.07	1.04	13.40	4.86	2.17	4.09	18.70	5.87	2.98	2.51
8.20	1.32	0.08	1.11	13.50	4.89	2.19	4.00	18.80	5.88	2.99	2.49
8.30	1.35	0.09	1.21	13.60	4.91	2.21	3.91	18.90	5.90	3.01	2.47
8.40	1.39	0.10	1.36	13.70	4.94	2.23	3.82	19.00	5.92	3.02	2.45
8.50	1.42	0.11	1.53	13.80	4.96	2.25	3.73	19.10	5.93	3.03	2.43
8.60	1.46	0.12	1.73	13.90	4.98	2.27	3.64	19.20	5.94	3.04	2.41
8.70	1.51	0.13	1.95	14.00	5.01	2.28	3.54	19.30	5.96	3.05	2.39
8.80	1.55	0.15	2.18	14.10	5.03	2.30	3.45	19.40	5.97	3.07	2.37
8.90	1.60	0.16	2.42	14.20	5.05	2.32	3.37	19.50	5.99	3.08	2.35
9.00	1.65	0.18	2.68	14.30	5.07	2.33	3.31	19.60	6.00	3.09	2.34
9.10	1.71	0.20	2.96	14.40	5.09	2.35	3.27	19.70	6.02	3.10	2.32
9.20	1.76	0.22	3.27	14.50	5.11	2.37	3.24	19.80	6.03	3.11	2.30
9.30	1.83	0.25	3.64	14.60	5.13	2.38	3.22	19.90	6.04	3.13	2.28
9.40	1.90	0.28	4.09	14.70	5.15	2.40	3.20	20.00	**6.06**	**3.14**	2.26
9.50	1.97	0.31	4.60	14.80	5.17	2.42	3.18				
9.60	2.08	0.35	5.19	14.90	5.19	2.43	3.17				
9.70	2.25	0.44	6.35	15.00	5.21	2.45	3.15				
9.80	2.52	0.58	9.14	15.10	5.23	2.46	3.14				
9.90	3.01	0.86	15.04	15.20	5.25	2.48	3.12				
10.00	3.35	1.08	26.69	15.30	5.27	2.50	3.10				
10.10	3.46	1.15	**36.82**	15.40	5.29	2.51	3.09				
10.20	3.56	1.22	**34.24**	15.50	5.31	2.53	3.07				

Summary for Pond D3 exit: Free Flow

Inflow Area = 64.000 ac, 38.00% Impervious, Inflow Depth > 4.51" for 100 yr event
Inflow = 281.69 cfs @ 9.87 hrs, Volume= 24.043 af
Primary = 281.69 cfs @ 9.87 hrs, Volume= 24.043 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Pond D3 exit: Free Flow



Hydrograph for Pond D3 exit: Free Flow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00		0.00	18.25	9.81		9.81
5.25	3.61		3.61	18.50	9.62		9.62
5.50	4.53		4.53	18.75	9.42		9.42
5.75	4.26		4.26	19.00	9.23		9.23
6.00	4.90		4.90	19.25	9.03		9.03
6.25	5.49		5.49	19.50	8.84		8.84
6.50	6.42		6.42	19.75	8.64		8.64
6.75	7.28		7.28	20.00	8.44		8.44
7.00	8.25		8.25				
7.25	8.82		8.82				
7.50	9.37		9.37				
7.75	9.91		9.91				
8.00	10.50		10.50				
8.25	13.55		13.55				
8.50	16.98		16.98				
8.75	20.44		20.44				
9.00	24.14		24.14				
9.25	30.66		30.66				
9.50	39.25		39.25				
9.75	**131.74**		**131.74**				
10.00	**98.91**		**98.91**				
10.25	51.04		51.04				
10.50	35.70		35.70				
10.75	30.76		30.76				
11.00	26.74		26.74				
11.25	25.21		25.21				
11.50	23.68		23.68				
11.75	22.24		22.24				
12.00	20.71		20.71				
12.25	19.77		19.77				
12.50	18.82		18.82				
12.75	17.88		17.88				
13.00	16.93		16.93				
13.25	15.97		15.97				
13.50	15.01		15.01				
13.75	14.04		14.04				
14.00	13.08		13.08				
14.25	12.86		12.86				
14.50	12.67		12.67				
14.75	12.49		12.49				
15.00	12.30		12.30				
15.25	12.11		12.11				
15.50	11.93		11.93				
15.75	11.74		11.74				
16.00	11.55		11.55				
16.25	11.36		11.36				
16.50	11.17		11.17				
16.75	10.97		10.97				
17.00	10.78		10.78				
17.25	10.59		10.59				
17.50	10.40		10.40				
17.75	10.20		10.20				
18.00	10.01		10.01				

Summary for Subcatchment D3-2: D3

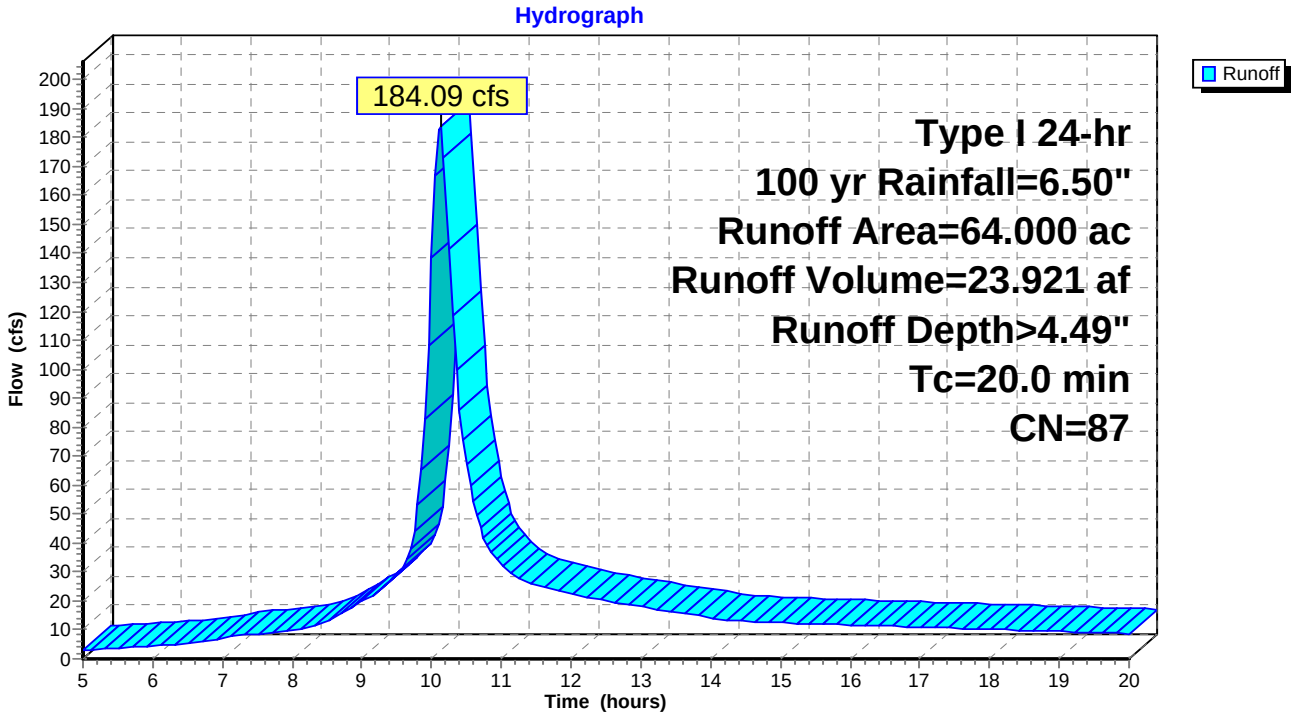
Runoff = 184.09 cfs @ 10.12 hrs, Volume= 23.921 af, Depth> 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type I 24-hr 100 yr Rainfall=6.50"

Area (ac)	CN	Description
64.000	87	1/4 acre lots, 38% imp, HSG D
39.680		62.00% Pervious Area
24.320		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry, My own Tc**

Subcatchment D3-2: D3



Hydrograph for Subcatchment D3-2: D3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.65	0.07	3.12	10.30	3.65	2.32	118.63	15.60	5.33	3.88	12.08
5.10	0.67	0.07	3.26	10.40	3.72	2.39	85.82	15.70	5.35	3.90	12.00
5.20	0.68	0.08	3.39	10.50	3.79	2.44	66.93	15.80	5.37	3.92	11.93
5.30	0.70	0.08	3.52	10.60	3.85	2.50	54.36	15.90	5.39	3.94	11.85
5.40	0.71	0.09	3.65	10.70	3.90	2.55	45.38	16.00	5.41	3.95	11.78
5.50	0.73	0.10	3.78	10.80	3.95	2.59	39.27	16.10	5.43	3.97	11.70
5.60	0.75	0.10	3.91	10.90	4.00	2.64	35.30	16.20	5.45	3.99	11.62
5.70	0.76	0.11	4.04	11.00	4.05	2.68	32.48	16.30	5.46	4.01	11.55
5.80	0.78	0.12	4.17	11.10	4.09	2.72	30.34	16.40	5.48	4.02	11.47
5.90	0.80	0.12	4.29	11.20	4.14	2.76	28.65	16.50	5.50	4.04	11.40
6.00	0.81	0.13	4.42	11.30	4.18	2.80	27.34	16.60	5.52	4.06	11.32
6.10	0.83	0.14	4.54	11.40	4.22	2.84	26.38	16.70	5.54	4.08	11.24
6.20	0.85	0.15	4.68	11.50	4.26	2.88	25.63	16.80	5.55	4.09	11.17
6.30	0.87	0.16	4.88	11.60	4.30	2.91	24.96	16.90	5.57	4.11	11.09
6.40	0.88	0.16	5.13	11.70	4.34	2.95	24.34	17.00	5.59	4.13	11.01
6.50	0.90	0.17	5.42	11.80	4.38	2.98	23.73	17.10	5.61	4.14	10.94
6.60	0.92	0.18	5.73	11.90	4.41	3.02	23.13	17.20	5.62	4.16	10.86
6.70	0.95	0.20	6.06	12.00	4.45	3.05	22.53	17.30	5.64	4.18	10.78
6.80	0.97	0.21	6.40	12.10	4.48	3.08	21.93	17.40	5.66	4.19	10.71
6.90	0.99	0.22	6.75	12.20	4.51	3.11	21.35	17.50	5.68	4.21	10.63
7.00	1.01	0.23	7.11	12.30	4.55	3.14	20.84	17.60	5.69	4.22	10.55
7.10	1.04	0.24	7.49	12.40	4.58	3.17	20.40	17.70	5.71	4.24	10.47
7.20	1.06	0.26	7.85	12.50	4.61	3.20	19.99	17.80	5.73	4.26	10.40
7.30	1.09	0.27	8.17	12.60	4.64	3.23	19.60	17.90	5.74	4.27	10.32
7.40	1.11	0.29	8.44	12.70	4.67	3.26	19.22	18.00	5.76	4.29	10.24
7.50	1.13	0.30	8.69	12.80	4.70	3.29	18.84	18.10	5.78	4.30	10.16
7.60	1.16	0.31	8.92	12.90	4.73	3.31	18.46	18.20	5.79	4.32	10.09
7.70	1.18	0.33	9.14	13.00	4.76	3.34	18.08	18.30	5.81	4.33	10.01
7.80	1.21	0.35	9.36	13.10	4.79	3.37	17.70	18.40	5.82	4.35	9.93
7.90	1.24	0.36	9.58	13.20	4.81	3.39	17.32	18.50	5.84	4.36	9.85
8.00	1.26	0.38	9.80	13.30	4.84	3.42	16.93	18.60	5.85	4.38	9.78
8.10	1.29	0.39	10.02	13.40	4.86	3.44	16.55	18.70	5.87	4.39	9.70
8.20	1.32	0.41	10.35	13.50	4.89	3.46	16.17	18.80	5.88	4.41	9.62
8.30	1.35	0.43	10.97	13.60	4.91	3.49	15.79	18.90	5.90	4.42	9.54
8.40	1.39	0.46	11.91	13.70	4.94	3.51	15.40	19.00	5.92	4.44	9.46
8.50	1.42	0.48	13.05	13.80	4.96	3.53	15.01	19.10	5.93	4.45	9.39
8.60	1.46	0.51	14.30	13.90	4.98	3.55	14.63	19.20	5.94	4.46	9.31
8.70	1.51	0.54	15.62	14.00	5.01	3.57	14.24	19.30	5.96	4.48	9.23
8.80	1.55	0.57	16.97	14.10	5.03	3.59	13.85	19.40	5.97	4.49	9.15
8.90	1.60	0.61	18.33	14.20	5.05	3.61	13.50	19.50	5.99	4.51	9.07
9.00	1.65	0.64	19.72	14.30	5.07	3.63	13.23	19.60	6.00	4.52	8.99
9.10	1.71	0.68	21.16	14.40	5.09	3.65	13.06	19.70	6.02	4.53	8.91
9.20	1.76	0.73	22.73	14.50	5.11	3.67	12.94	19.80	6.03	4.55	8.84
9.30	1.83	0.77	24.65	14.60	5.13	3.69	12.84	19.90	6.04	4.56	8.76
9.40	1.90	0.83	26.92	14.70	5.15	3.71	12.76	20.00	**6.06**	**4.57**	8.68
9.50	1.97	0.88	29.45	14.80	5.17	3.73	12.68				
9.60	2.08	0.97	32.32	14.90	5.19	3.75	12.60				
9.70	2.25	1.10	38.34	15.00	5.21	3.77	12.53				
9.80	2.52	1.33	53.07	15.10	5.23	3.79	12.45				
9.90	3.01	1.75	83.03	15.20	5.25	3.81	12.38				
10.00	3.35	2.05	138.67	15.30	5.27	3.82	12.30				
10.10	3.46	2.15	**182.58**	15.40	5.29	3.84	12.23				
10.20	3.56	2.24	164.81	15.50	5.31	3.86	12.15				

APPENDIX E

USACE JD FORM

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: | PJD Date: November 3, 2019

State: CA | City/County: Mission Viejo/Orange

Nearest Waterbody: Unnamed drainages to Arroyo Trabuco

Location: TRS, LatLong or UTM: -117.631663˚west /33.631663˚north

Name/ Address of Person Requesting PJD:
Gonzales Environmental Consulting, LLC
Teresa Gonzales
358 Crystal Drive
San Jacinto, CA92583

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 4017 linear ft | 0.301 acres | Stream Flow: Intermittant

Wetlands: acre(s) | Cowardin Class: Riverine

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: | Non-Tidal:

☐ Office (Desk) Determination
☐ Field Determination: Date of Field Trip:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☑ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☑ U.S. Geological Survey map(s). Cite quad name: San Juan Capistrano
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Soil Survey Staff, Natural Resources Conservation
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): Google, 2019
  - ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): Jurisdictional Delineation

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Teresa Gonzales

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #		PJD Date:	Nov 3, 2019
State	CA	City/County	Mission Viejo/Orange	Person Requestinq PJD	Teresa Gonzales

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
	33.631663N	-117.631663W	Riverine	0.301 acres	Non-Section 10 non-wetland

Notes:

The existing project waters of unnamed drainages flow off site into Arroyo Trabuco. Please see attached connectivity analysis.

APPENDIX F

CONNECTIVITY MAP & ANALYSIS



Hydrologic Connectivity Analysis

CURTIS PARK

The JD for the project concerns unnamed drainages [-117.631663˚west and latitude 33.631663˚north] which are tributary to Arroyo Trabuco which is tributary to San Juan Creek and eventually the Pacific Ocean in the City of Mission Viejo of County of Orange, California.

Two of the drainages (D-1 and D-3) are natural channel which begin with over the side drains from Olympiad Road. Drainage 2 begins at Landscape maintenance and from existing Curtis Park and join with Drainage 3. The unnamed drainages starts on the project site, flows 4017 feet through the project site where it exits the project and hydrologically connects to Arroyo Trabuco which then connects to San Juan Creek (3.5 miles), which connects to Pacific Ocean (2.25 miles).

Drainage gradient for the project site is 11%, project site to San Juan Creek is 7%.

Unnamed drainage OHWM of the 4017 foot-long natural channels consists of an incised channel the width of which averages 3-5 feet. The natural channel contains bare ground, grassland and Quercus Agrifolia alliance habitat. Downstream the drainages free flow on to Arroyo Trabuco. The stretch into San Juan Creek consists of natural channel with riparian habitat.

Chemical characteristics of flows within the drainages are dictated by the land use of the drainage area (51.2 acres for Drainage 1, 19.2 acres for Drainage 2, and 64 acres for Drainage 3) which consists of natural and urban landscape. Storm and nuisance water contributes along with non-point source chemicals associated with the urban landscape are found throughout the drainage area. As a result, non-point-source chemicals associated with the urban landscape including residential uses have the potential to be present within storm and nuisance flows.

Furthermore, Arroyo Trabuco Creek is on the 303(d) list (TMDL required list) of impaired waters for Diazinon, Phosphorus, Total Nitrogen as N, and Toxicity[1]. With respect to storm flows, the 2-year, 24-hour precipitation is 2.5 inches in the project area. The 100-year, 12-hour precipitation is 6.5 inches in the project area. Unnamed Drainage 1 Q2 is 58.27 cfs, Q5 is 140.78 cfs, and Q100 is 225.87cfs Unnamed Drainage 2 Q2 is 53.26 cfs, Q5 is 150.39 cfs, and Q100 is 256.72 cfs. Unnamed Drainage 3 Q2 is 72.84 cfs, Q5 is 175.34 cfs, and Q100 is 281.69 cfs.

In summary the unnamed drainages are: (1) tributary to Arroyo Trabuco and located in the City of Mission Viejo of County of Orange, California; (2) conveys flows from the natural and urban landscape; (3) Unnamed Drainage 1 Q2 is 58.27 cfs, Q5 is 140.78 cfs, and Q100 is 225.87cfs Unnamed Drainage 2 Q2 is 53.26 cfs, Q5 is 150.39 cfs, and Q100 is 256.72 cfs. Unnamed Drainage 3 Q2 is 72.84 cfs, Q5 is 175.34 cfs, and Q100 is 281.69 cfs and (4) supports an OHWM that contains bare ground, grassland and Quercus agrifolia alliance species. Based on the above, we conclude that the unnamed drainages are relatively permanent water (RPW) per the Rapanos JD process, and therefore is a water of the United States.

Hydrograph data source:

Orange County Hydrology Manual 1986. 190 pgs.
Orange County Hydrology Manual 1986 Soil Maps. 3 pgs.
County of Orange Environmental Management Agency. 1996. Orange County Local Drainage Manual 267 pgs.
Rain Gage Data: HB Edison WQ station DCC; Station ID: 21CAOCSD-DCC
USGS 11047300 ARROYO TRABUCO A SAN JUAN CAPISTRANO CA

[1] USEPA. 2010. Approved 2010 303(d) list.
https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml?wbid=CAB80114000200502
01172510

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901
http://www.fws.gov/carlsbad/

In Reply Refer To:
Consultation Code: 08ECAR00-2020-SLI-0117
Event Code: 08ECAR00-2020-E-00266
Project Name: Robert A Curtis Park

October 22, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Consultation Code: 08ECAR00-2020-SLI-0117

Event Code: 08ECAR00-2020-E-00266

Project Name: Robert A Curtis Park

Project Type: RECREATION CONSTRUCTION / MAINTENANCE

Project Description: Expansion of existing Park

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/33.605603593319955N117.63299118130344W



Counties: Orange, CA

Endangered Species Act Species

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Pacific Pocket Mouse *Perognathus longimembris pacificus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8080	Endangered

Birds

NAME	STATUS
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Coastal California Gnatcatcher *Polioptila californica californica* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8178	Threatened
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered

Amphibians

NAME	STATUS
Arroyo (=arroyo Southwestern) Toad *Anaxyrus californicus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3762	Endangered

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Crustaceans

NAME	STATUS
Riverside Fairy Shrimp *Streptocephalus woottoni* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8148	Endangered
San Diego Fairy Shrimp *Branchinecta sandiegonensis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6945	Endangered

Flowering Plants

NAME	STATUS
Big-leaved Crownbeard *Verbesina dissita* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8049	Threatened
Laguna Beach Liveforever *Dudleya stolonifera* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7919	Threatened
Thread-leaved Brodiaea *Brodiaea filifolia* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6087	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.