Arroyo Seco Water Reuse Project

CITY OF PASADENA



Environmental Impact Report | May 2026

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PSOMAS

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Appendix A-1

Notice of Preparation

Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting Arroyo Seco Water Reuse Project

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report and Public Scoping Meeting

The City of Pasadena (Pasadena) is the designated Lead Agency for the preparation of an Environmental Impact Report (EIR) for the Arroyo Seco Water Reuse Project (Project) pursuant to an agreement between Pasadena and the City of South Pasadena (South Pasadena) in accordance with State CEQA Guidelines Section 15051(d). The Project would be implemented by the City of Pasadena Department of Public Works in cooperation with the City of South Pasadena Department of Public Works.

In accordance with CEQA Guidelines Section 15082, Pasadena has prepared this Notice of Preparation (NOP) to provide responsible and trustee agencies, organizations, interested persons, the Los Angeles County Clerk, and the State Clearinghouse with sufficient information describing the Project and its potential environmental effects to enable these parties to make a meaningful response. For public agencies, Pasadena requests your agency's views on the scope and content of the environmental information relevant to your agency's statutory responsibilities in connection with the proposed Project, in accordance with CEQA Guidelines Section 15082(b). For organizations and interested parties, Pasadena requests your comments and concerns regarding the environmental issues associated with construction and operation of the proposed Project, in accordance with CEQA Guidelines Section 15083. Additionally, this NOP serves as a notice for the public Scoping Meeting, which is held to facilitate the consultation process.

PUBLIC REVIEW PERIOD: Pursuant to CEQA Guidelines Section 15082(b), the NOP will be available for public review and comment for a 30-day period, from **Thursday, May 15, 2025 through Friday, June 13, 2025**.

PROJECT LOCATION: The Project site encompasses a total of approximately 3.7 acres on two sites in the Lower Arroyo Seco that are situated adjacent to the Arroyo Seco Channel – the northern, San Rafael site (1.5 acres) in the City of Pasadena; and the southern, San Pascual site (2.2 acres), in the cities of South Pasadena and Los Angeles (see Exhibit 1, Regional Location and Local Vicinity). Both sites are within the County of Los Angeles; and both sites are comprised of vacant, open space-zoned lands primarily within the cities of Pasadena and South Pasadena, respectively, with a portion of the San Pascual site (approximately 0.53-acre) within the City of Los Angeles. Both sites are immediately adjacent to the concrete Arroyo Seco Channel (Channel) that is under the jurisdiction of the Los Angeles County Flood Control District (LACFCD). The two sites are approximately 850 feet (0.16 mile) apart at the closest points.

The San Rafael site is situated southwest of the San Rafael Avenue overpass of the Channel, on the west side of the Channel, and adjacent to Pasadena's southern boundary. The San Rafael site includes a linear feature that is within the limits of the San Rafael Creek easement under LACFCD jurisdiction. The San Pascual site is situated southeast of the San Pascual Avenue overpass of the Channel and on the east side of the Channel. The San Pascual site is bound by San Pascual Avenue on the north and Stoney Drive on the east. The sites are regionally accessible via State Route 134 (SR 134), which is located approximately 1.25 miles north of the San Rafael site; and SR 110, which is located approximately 0.10 mile south of the San Pascual site.

PROJECT SUMMARY: The proposed Arroyo Seco Water Reuse Project would develop two regional stormwater capture and treatment facilities (man-made treatment wetlands and infiltration basins) located within existing open space-zoned areas near the Arroyo Seco Channel. Additionally, as part of the Project, an off-site water harvester and related infrastructure would be installed within the existing, gated maintenance yard at the public Arroyo Seco Golf Course in South Pasadena. The Project would provide water quality benefits for multiple jurisdictions within the 5,005-acre drainage area in which the two sites are located. For both sites, the Project would include native landscaping; hardscape elements including reclaimed wood log benches, post-and-rail fencing, and concrete seat walls faced with natural stone; informational signs as a watershed education opportunity; and expand the existing trail network to enhance regional trail connectivity through the Lower Arroyo Seco.

The Project sites are located within the Upper Los Angeles River (ULAR) Watershed. Runoff from this watershed drains to and runs through over 50 linear miles of the Los Angeles River and then to the Pacific Ocean. The Arroyo Seco Channel is a major tributary to the Los Angeles River. On July 9, 2010, the Los Angeles Regional Water Quality Control Board (RWQCB) adopted resolution No. R10-007 incorporating a total maximum daily load (TMDL) for indicator bacteria in the Los Angeles River watershed. A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody and not affect that waterbody's ability to meet and

maintain water quality standards. Outfalls along the Arroyo Seco Channel were modeled for indicator bacteria and the San Rafael Creek outfall was identified as a priority outfall; these outfalls have routine problematic discharges that drive the total bacteria load. Runoff in San Rafael Creek would be diverted into the San Rafael site, pre-treated, and a portion of this runoff infiltrated for groundwater recharge. The portion not infiltrated would be treated, discharged into the Channel, and then diverted downstream into the San Pascual site for infiltration and additional treatment prior to discharge back to the Channel. The operation of these two regional stormwater management sites would result in an annual average water supply benefit of 320 acre-feet (af). Of this, there would be approximately 258 af of groundwater recharge and approximately 30 af (or less than 10 percent of captured water) would be captured off-site for irrigation reuse at the golf course to reduce potable water demand.

In addition to fulfilling regulatory obligations placed on Pasadena to provide cleaner water in the Arroyo Seco and Los Angeles River channels, other Project benefits include increased habitat and reestablishment of natural plant communities, improved trails, increased public access to open space areas, and educational opportunities utilizing interpretive materials focused on hydrology and native habitat.

POTENTIAL ENVIRONMENTAL EFFECTS: Consistent with CEQA Guidelines Section 15060(d), Pasadena conducted a preliminary review of the Project to focus the EIR on the potentially significant effects of the project. Pasadena anticipates the following topical areas have the potential to result in significant impacts: Aesthetics, Air Quality, Biological Resources, Cultural Resources (including Paleontological Resources), Greenhouse Gas Emissions, Hydrology and Water Quality, Land Use and Planning, Noise, Public Services (parks), Recreation, Tribal Cultural Resources and Wildfire. The following topical area are expected to result in no impacts or less than significant impacts: Agriculture and Forestry Resources, Energy, Geology and Soils (except Paleontological Resources), Hazards and Hazardous Resources, Mineral Resources, Population and Housing, Public Services (law enforcement, fire protection, schools, and other public services), Transportation, Utilities and Service Systems.

SCOPING MEETING: A public Scoping Meeting will be held to share information regarding the Project, the environmental review process, and to receive comments about the scope and content of the environmental analysis to be addressed in the Draft EIR. The Scoping Meeting is an information-gathering meeting, not a public hearing, and no public testimony or recordation of the meeting will occur. Attendees may submit comments in writing at the Scoping Meeting or submit anytime during the public review period.

No decisions about the Project will be made at the Scoping Meeting. A separate public hearing for entitlement requests and consideration of certification of the EIR will be scheduled after the completion of the Final EIR. The date, time, and location of the public Scoping Meeting are as follows:

DATE: Wednesday, May 28, 2025

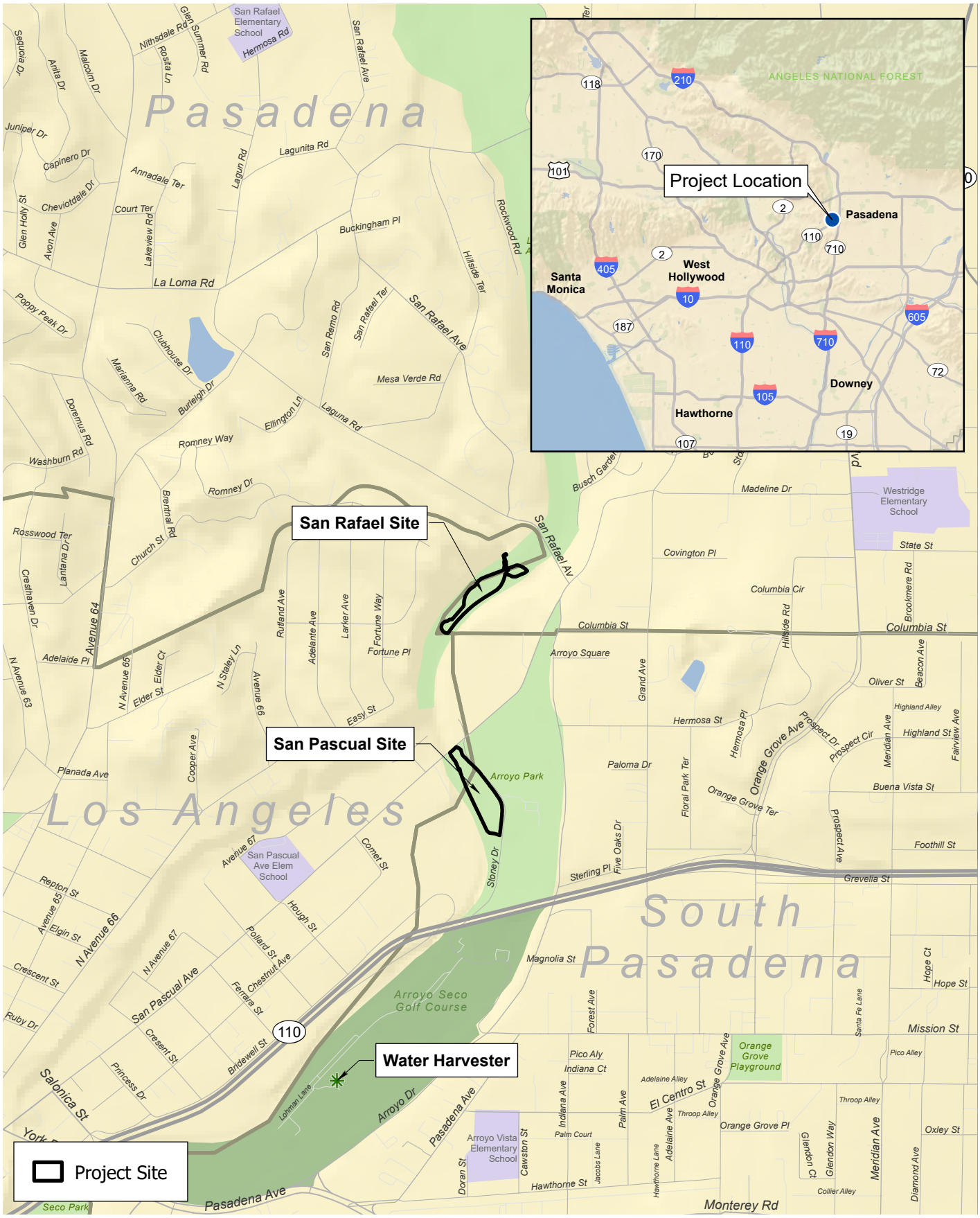
TIME: 6:00 PM–8:00 PM

LOCATION: South Pasadena Community Room
1115 El Centro Street
South Pasadena, CA 91030

SUBMITTING COMMENTS: A copy of this NOP may be viewed online at https://www.cityofpasadena.net/planning/arroyo-seco-water-reuse-project/ and will be available for viewing during regular business hours at the City of Pasadena Permit Center (175 North Garfield Avenue, Pasadena, CA 91101); the San Rafael Library (1240 Nithsdale Road, Pasadena, CA 91105); the South Pasadena Public Library (1100 Oxley Street, South Pasadena, CA 91030); and the Arroyo Seco Regional Branch Library (6145 North Figueroa Street, Los Angeles, CA 90042).

The City will consider all written comments regarding the potential environmental effects of the Project received during the scoping period. Written comments, including e-mails, must be submitted in writing by 5:00 PM on June 13, 2025. Written comments will also be accepted at the Scoping Meeting described above. Due to the time limits mandated by State law, your comments must be received by Pasadena no later than 30 days after receipt of this NOP. Please direct your written comments via e-mail and/or U.S. mail to:

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101
E-mail: CMonde@cityofpasadena.net



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Regional Location and Local Vicinity

Exhibit 1

Arroyo Seco Water Reuse Project

N
W
E
S

1,000 500 0 1,000 Feet

PSOMAS

(Rev: 8-14-2023 JVR) R:\Projects\PAS_Pasaden\3PAS010750\Graphics\MND\ex_LV_RL.pdf

Aviso de Preparación de un Informe de Impacto Ambiental y Reunión Pública de Alcance Proyecto de Reutilización de Agua del Arroyo Seco

PARA: Agencias responsables y fiduciarias, organizaciones y partes interesadas

ASUNTO: Aviso de preparación de un borrador del Informe de Impacto Ambiental y reunión pública de alcance

La Ciudad de Pasadena (Pasadena) es la agencia líder designada para la preparación de un Estudio del Impacto Ambiental (EIR, por sus siglas en inglés) para el Proyecto de Reutilización de Agua del Arroyo Seco (el Proyecto), conforme a un acuerdo entre Pasadena y la Ciudad de South Pasadena (South Pasadena), de acuerdo con la Sección 15051(d) de las Directrices Estatales del CEQA. El Proyecto sería implementado por el Departamento de Obras Públicas de la Ciudad de Pasadena en cooperación con el Departamento de Obras Públicas de la Ciudad de South Pasadena.

En conformidad con la Sección 15082 de las Directrices del CEQA, Pasadena ha preparado este Aviso de Preparación (NOP, por sus siglas en inglés) para proporcionar a las agencias responsables y fiduciarias, organizaciones, personas interesadas, el Secretario del Condado de Los Ángeles y la Oficina Estatal de Revisión información suficiente que describa el Proyecto y sus posibles efectos ambientales, a fin de permitir a estas partes emitir una respuesta significativa. Para las agencias públicas, Pasadena solicita la opinión de su agencia sobre el alcance y contenido de la información ambiental relevante a las responsabilidades legales de su agencia en relación con el Proyecto propuesto, conforme a la Sección 15082(b) del CEQA. Para las organizaciones y partes interesadas, Pasadena solicita sus comentarios y preocupaciones sobre los temas ambientales asociados con la construcción y operación del Proyecto propuesto, conforme a la Sección 15083 del CEQA. Además, este NOP sirve como aviso de la Reunión Pública de Alcance, la cual se lleva a cabo para facilitar el proceso de consulta.

PERÍODO DE REVISIÓN PÚBLICA: En conformidad con la Sección 15082(b) de las Directrices del CEQA, el NOP estará disponible para revisión y comentarios del público durante un período de 30 días, desde el **Jueves 15 de Mayo del 2025 hasta el Viernes 13 de Junio del 2025.**

UBICACIÓN DEL PROYECTO: El sitio del Proyecto abarca un total de aproximadamente 3.7 acres en dos ubicaciones en la parte baja del Arroyo Seco, situadas junto al Canal del Arroyo Seco: el sitio norte, San Rafael (1.5 acres), en la Ciudad de Pasadena; y el sitio sur, San Pascual (2.2 acres), en las ciudades de South Pasadena y Los Ángeles (ver el Anexo 1, Ubicación Regional y Vecindad Local). Ambos sitios se encuentran dentro del Condado de Los Ángeles y están compuestos por terrenos baldíos con zonificación de espacio abierto, ubicados principalmente en las ciudades de Pasadena y South Pasadena, respectivamente, con una porción del sitio San Pascual (aproximadamente 0.53 acres) dentro de la Ciudad de Los Ángeles. Ambos sitios colindan directamente con el Canal de Concreto del Arroyo Seco (el Canal), que está bajo la jurisdicción del Distrito de Control de Inundaciones del Condado de Los Ángeles (LACFCD, por sus siglas en inglés). Las dos ubicaciones están separadas por aproximadamente 850 pies (0.16 millas) en sus puntos más cercanos.

El sitio San Rafael está ubicado al suroeste del paso elevado de la Avenida San Rafael sobre el Canal, en el lado oeste del Canal y junto al límite sur de Pasadena. El sitio San Rafael incluye una franja lineal dentro de los límites de la servidumbre del Arroyo San Rafael, bajo la jurisdicción del LACFCD. El sitio San Pascual está ubicado al sureste del paso elevado de la Avenida San Pascual sobre el Canal, en el lado este del Canal. Este sitio está delimitado por la Avenida San Pascual al norte y por Stoney Drive al este. Los sitios son accesibles a nivel regional a través de la Ruta Estatal 134 (SR 134), ubicada aproximadamente a 1.25 millas al norte del sitio San Rafael; y de la Ruta Estatal 110 (SR110), que se encuentra aproximadamente a 0.10 millas al sur del sitio San Pascual.

RESUMEN DEL PROYECTO: El Proyecto propuesto de Reutilización de Agua del Arroyo Seco desarrollaría dos instalaciones regionales para la captura y el tratamiento de aguas pluviales (humedales artificiales de tratamiento y estanques de infiltración), ubicadas dentro de áreas ya zonificadas como espacio abierto cerca del Canal del Arroyo Seco. Además, como parte del Proyecto, se instalaría un recolector de agua fuera del sitio y la infraestructura asociada dentro del patio de mantenimiento localizado en el Campo de Golf Público Arroyo Seco en South Pasadena. El Proyecto proporcionaría beneficios de calidad del agua para múltiples jurisdicciones dentro del área de drenaje de 5,005 acres en la que se encuentran los dos sitios. Para ambos sitios, el Proyecto incluiría paisajismo con especies nativas; elementos duros como bancos de troncos de madera recuperada, cercas de postes y rieles, y muros bajos de concreto revestidos con piedra natural; señalización informativa como oportunidad educativa sobre cuencas; y la expansión de la red de senderos existente para mejorar la conectividad regional de los senderos a través del Arroyo Seco Inferior.

Los sitios del Proyecto están ubicados dentro de la Cuenca Hidrográfica del Alto Río Los Ángeles (ULAR, por sus siglas en inglés). La escorrentía de esta cuenca fluye a través de más de 50 millas lineales del Río Los Ángeles y luego hacia el Océano Pacífico. El Canal del Arroyo Seco es un afluente principal del Río Los Ángeles. El 9 de julio de 2010, la Junta Regional de Control de Calidad del Agua de Los Ángeles (RWQCB, por sus siglas en inglés) adoptó la Resolución N0. R10-007, incorporando una Carga Máxima Diaria Total (TMDL, por sus siglas en inglés) para bacterias indicadoras en la cuenca del Río Los Ángeles. Un TMDL es el cálculo de la cantidad máxima de un contaminante que puede ingresar a un cuerpo de

agua sin afectar su capacidad para cumplir y mantener los estándares de calidad del agua. Se modelaron los puntos de descarga a lo largo del Canal del Arroyo Seco para bacterias indicadoras y el punto de descarga del Arroyo San Rafael fue identificado como prioritario; estos puntos tienen descargas problemáticas rutinarias que contribuyen significativamente a la carga total de bacterias. La escorrentía del Arroyo San Rafael se desviaría hacia el sitio San Rafael, donde sería pretratada, y una parte se infiltraría para la recarga del acuífero. La porción no infiltrada sería tratada, descargada en el Canal, y luego redirigida hacia el sitio San Pascual para su infiltración y tratamiento adicional antes de ser devuelta al Canal. El funcionamiento de estos dos sitios regionales de gestión de aguas pluviales resultaría en un beneficio anual promedio al suministro de agua de 320 acres-pie (af). De este total, aproximadamente 258 af corresponderían a recarga del acuífero y aproximadamente 30 af (o menos del 10 por ciento del agua capturada) serían recolectados fuera del sitio para su reutilización en riego en el campo de golf, reduciendo así la demanda de agua potable.

Además de cumplir con las obligaciones regulatorias impuestas a Pasadena para mejorar la calidad del agua en los canales del Arroyo Seco y del Río Los Ángeles, otros beneficios del Proyecto incluyen el aumento del hábitat y la restauración de comunidades vegetales nativas, la mejora de senderos, el incremento del acceso público a áreas de espacio abierto y oportunidades educativas mediante materiales interpretativos enfocados en la hidrología y el hábitat nativo.

IMPACTOS AMBIENTALES POTENCIALES: En conformidad con la Sección 15060(d) de las Directrices del CEQA, Pasadena realizó una revisión preliminar del Proyecto con el fin de enfocar el EIR en los posibles efectos significativos del mismo. Pasadena anticipa que las siguientes áreas temáticas tienen el potencial de generar impactos significativos: estética, calidad del aire, recursos biológicos, recursos culturales (incluidos los recursos paleontológicos), emisiones de gases de efecto invernadero, hidrología y calidad del agua, uso del suelo y planificación, ruido, servicios públicos (parques), recreación, recursos culturales tribales e incendios forestales.

Se espera que las siguientes áreas temáticas no generen impactos o solo impactos menos que significativos: recursos agrícolas y forestales, energía, geología y suelos (excepto los recursos paleontológicos), riesgos y materiales peligrosos, recursos minerales, población y vivienda, servicios públicos (aplicación de la ley, protección contra incendios, escuelas y otros servicios públicos), transporte, y sistemas de servicios públicos e infraestructura.

REUNIÓN DE ALCANCE: Se llevará a cabo una Reunión Pública de Alcance para compartir información sobre el Proyecto, el proceso de revisión ambiental y para recibir comentarios sobre el alcance y contenido del análisis ambiental que se abordará en el Borrador del Informe de Impacto Ambiental (EIR). La Reunión de Alcance es una reunión para recopilar información, no una audiencia pública, y no se tomará testimonio público ni se registrará la reunión. Los asistentes pueden presentar comentarios por escrito durante la Reunión de Alcance o en cualquier momento durante el período de revisión pública.

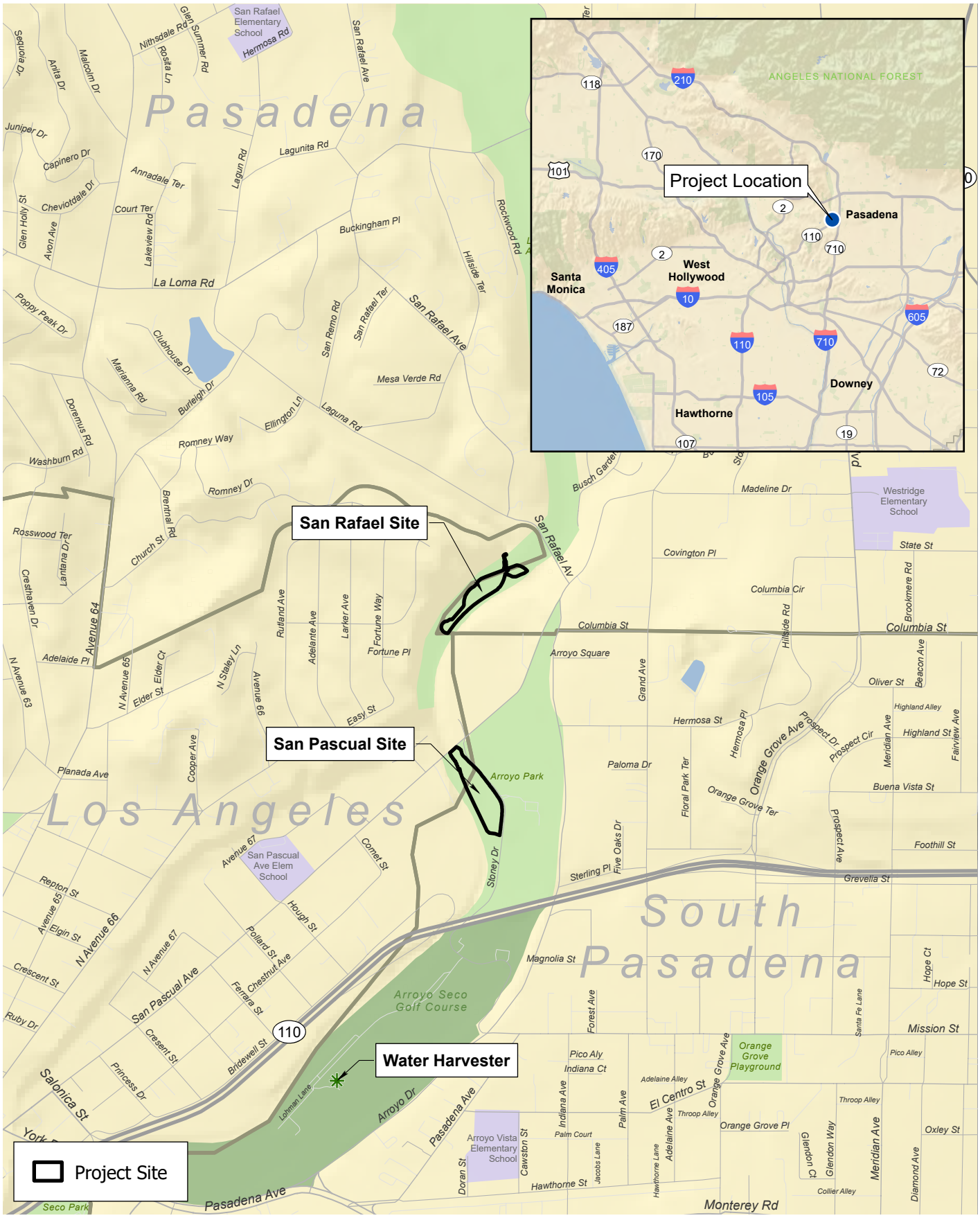
No se tomarán decisiones sobre el Proyecto durante la Reunión de Alcance. Una audiencia pública separada para considerar las solicitudes de aprobación y la certificación del EIR se programará después de completar el EIR Final. La fecha, hora y lugar de la Reunión Pública de Alcance son los siguientes:

FECHA: Miércoles, 28 de Mayo del 2025
HORA: 6:00 PM–8:00 PM
LUGAR: Sala Comunitaria de South Pasadena
1115 El Centro Street
South Pasadena, CA 91030

ENVÍO DE COMENTARIOS:
Una copia de este Aviso de Preparación (NOP) puede consultarse en línea en:
https://www.cityofpasadena.net/planning/arroyo-seco-water-reuse-project/
También estará disponible para su revisión durante el horario laboral habitual en los siguientes lugares Centro de Permisos de la Ciudad de Pasadena (175 North Garfield Avenue, Pasadena, CA 91101); Biblioteca San Rafael (1240 Nithsdale Road, Pasadena, CA 91105); Biblioteca Pública de South Pasadena (1100 Oxley Street, South Pasadena, CA 91030); Biblioteca Regional Arroyo Seco (6145 North Figueroa Street, Los Ángeles, CA 90042)

La Ciudad considerará todos los comentarios escritos recibidos durante el período de alcance sobre los posibles efectos ambientales del Proyecto. Los comentarios escritos, incluidos los enviados por correo electrónico, deben presentarse por escrito a más tardar a las 5:00 p.m. del 13 de junio de 2025. También se aceptarán comentarios escritos en la Reunión de Alcance descrita anteriormente. Debido a los plazos establecidos por la ley estatal, sus comentarios deben ser recibidos por Pasadena dentro de los 30 días posteriores a la recepción de este NOP. Por favor, envíe sus comentarios por correo electrónico y/o correo postal a:

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101
E-mail: CMonde@cityofpasadena.net


Project Location
Pasadena
Santa Monica
West Hollywood
Downey
Hawthorne
ANGELES NATIONAL FOREST
San Rafael Site
San Pascual Site
Water Harvester
Project Site
Arroyo Park
Arroyo Seco Golf Course
Arroyo Square
Arroyo Vista Elementary School
San Rafael Elementary School
San Pascual Ave Elem School
Westridge Elementary School
Orange Grove Playground
Seco Park
Los Angeles
South Pasadena
Hermosa Rd
Nithsdale Rd
Glen Summer Rd
San Rafael Ave
Lagunita Rd
La Loma Rd
Buckingham Pl
Mesa Verde Rd
Laguna Rd
Romney Way
Romney Dr
Washburn Rd
Church St
Rosswood Ter
Madeline Dr
Covington Pl
Columbia Cir
Columbia St
State St
Oliver St
Hermosa St
Paloma Dr
Buena Vista St
Foothill St
Grevelia St
Sterling Pl
Magnolia St
Mission St
Hope St
Pico Aly
Indiana Ct
Adelaine Alley
Throop Alley
Orange Grove Pl
Oxley St
Pico Alley
Palm Court
Hawthorne St
Monterey Rd
Collier Alley
Planada Ave
Repton St
Elgin St
Crescent St
Ruby Dr
Princess Dr
Salonica St
York
Bridewell St
Pollard St
Ferrara St
Chestnut Ave
Hough St
Comet St
Stoney Dr
Five Oaks Dr
Floral Park Ter
Orange Grove Ter
Prospect Dr
Prospect Cir
Prospect Ave
Highland Alley
Highland St
Meridian Ave
Fairview Ave
Beacon Ave
Brookmere Rd
Hillside Rd
Grand Ave
Fortune Way
Fortune Pl
Easy St
Adelante Ave
Rutland Ave
Larker Ave
Avenue 64
Avenue 65
Avenue 66
Avenue 67
N Avenue 63
N Steley Ln
Elder St
Cresthaven Dr
Lantana Dr
Brentnal Rd
Doremus Rd
Marianna Rd
Burleigh Dr
Clubhouse Dr
Ellington Ln
Poppy Peak Dr
Juniper Dr
Capinero Dr
Cheviotdale Dr
Court Ter
Annadale Ter
Lakeview Rd
Glen Holly St
Avon Ave
Anita Dr
Malcolm Dr
Rosita Ln
Hillside Ter
Rockwood Rd
San Remo Rd
San Rafael Ter
Lagun Rd
Busch Gardens
Pasadena Ave
Arroyo Dr
Lohman Lane
Doran St
Cawston St
Forest Ave
Indiana Ave
Palm Ave
Jacobs Lane
Hawthorne Lane
Santa Fe Lane
Glendon Ct
Glendon Way
Meridian Ave
Diamond Ave
Hope Ct
Throop Alley
Pico Alley
Orange Grove Ave
Elder Ct
Cooper Ave
Avenue 66
Avenue 67
N Avenue 65
N Avenue 66
N Avenue 67
San Pascual Ave
Adelaide Pl
Easy St
Stoney Dr
Arroyo Dr
Pasadena Ave
Monterey Rd
Mission St
Hope St
Oxley St
Foothill St
Buena Vista St
Grevelia St
Hermosa Pl
Orange Grove Ave
Meridian Ave
Fairview Ave
Beacon Ave
Brookmere Rd
Hillside Rd
Columbia St
Arroyo Square
Covington Pl
Madeline Dr
Busch Gardens
San Rafael Ave
Rockwood Rd
Hillside Ter
Buckingham Pl
Mesa Verde Rd
Laguna Rd
Romney Way
Romney Dr
Washburn Rd
Church St
Rosswood Ter
Cresthaven Dr
Lantana Dr
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Annadale Ter
Lakeview Rd
Glen Holly St
Avon Ave
Anita Dr
Malcolm Dr
Rosita Ln
Glen Summer Rd
Nithsdale Rd
Hermosa Rd
San Rafael Ave
Lagunita Rd
Lagun Rd
San Rafael Ter
San Remo Rd
Hillside Ter
Rockwood

Appendix A-2

Public Comments on Notice of Preparation

Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name KATRINA ALEXY **Phone** 3235735940

Address 5328 Abbott Place LA CA 90042 **Email** KALEXY@PILGRIM-SCHOOL.ORG

Comment

I support this restoration project. I feel it will be cleaner, safer, add beauty, provide a more natural & native habitat and improve the lives of many.

Please return comment sheets during the Scoping Meeting or mail to the address on the reverse side of the page by 5:00 PM on **Friday, June 13, 2025.**
Comments can also be e-mailed to **CMonde@cityofpasadena.net**

Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Elizabeth Buck **Phone** _

Address _ **Email** _

Comment I am a Science Teacher (Biology) in LAUSD on the LA side. My concern is that the existing stream in the San Rafael portion is a major source of WATER for wildlife in the area - that's accessible at grand level. We've had 10 dogs over the years and there is no place we've ever walked that is criss crossed with so many animal scent trails as South Pasadena's Park (Arroyo Park) next to the stream. The scent trails direction is from the hill that goes up to Pasadena Ave raw and the water, consistently, in 30 years of sniffing!

I assume there are possums, squirrels, raccoons, skunks, coyotes drinking there like on the Los Angeles side of the culvert. What alternative will they have for 2 years? How will these animals go get their nightly drink of water during the construction period? The water in the culvert is not accesible due to the elevation drop. The nearest grand level water (after spring rains drop up) is all the way past the 210. A coyote might go all the way up there but not the smaller animals. There needs

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to be something temporary set up for a water source in the meantime, and this would mitigate some environmental impact. Perhaps behind the ballfield or the pavilion would work?

Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Barbara Eisenstein **Phone** [redacted]

Address [redacted] **Email** [redacted]

Comment (1) I would like to see a truly Nature-based project in this area that does not increase the amount of buried pipes & concrete on the Arroyo.

(2) We should be working with other cities - LA, La Cañada, along with Pasadena & So. Pasadena. We have not worked nearly enough with citizens of Los Angeles.

(3) This project is at odds with the efforts to restart the Arroyo Seco Watershed Habitat Restoration work that began in the early 2000s & was ended by Army Corp in 2017 (I think). K. Barger has proposed that LA County restart this initiative.

I hope we can create a new plan to meet the stated goals while including hydrologic function & working toward a living Arroyo Seco.

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(4) I'd like to see a different consultant do the EIR - not PSOMAS since they did the MND.

Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Joaquin Hernandez Solis **Phone** _____

Address ~~Jose~~ Joquin **Email** [redacted]

Comment wants all notices!

[redacted]

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Comment Sheet

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PASADENA

City of SOUTH PASADENA

Name Jessica **Phone** _____

Address _____ **Email** [redacted]

Comment

I am concerned about the removal of currently standing native trees that are most likely 100 years old and replacing them with young trees that may not provide as much shade, fire resistance (by oak trees), and or proper habitat for the existing wildlife i.e. coyotes, birds, bears, turtles, frogs etc. I believe quality of tree matters more than quantity in this case. I'm ~~perfect~~ perfectly ok w/ removing palm trees.

Thanks.

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Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Tani Kaye **Phone** (323) 222-8264

Address 6641 Church St. **Email** tkayeric@yahoo.com

Comment EIR should take into consideration:
Save trees - do not cut down mature trees.
Trees provide shade and oxygen.
Replacing existing trees with saplings will take as much as 30 or more years to provide the shade and oxygen that currently exists.
Restore the river and reintroduce steelhead trout.
Do not reroute the water to the South Pasadena golf course. The water should be available to wildlife.
Wildlife will lose habitat when trees are removed.
These are just a few issues.
Please do not allow this beautiful park to be destroyed. Find a more environmentally friendly way to clean the water

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Comment Sheet

Arroyo Seco Water Reuse Project
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City of SOUTH PASADENA

Name Lesley Meyer **Phone** _____

Address [redacted] **Email** [redacted]

Comment

My partner and I live close to the Arroyo and walk there often. Any chance to beautify, improve, clean up, filter and enhance the native flora and fauna is a no-brainer.

I can't imagine any negatives with this proposal. It benefits everyone and will create more beauty, and transform the space closer to the way it was.

A giant cemented arroyo is not benefiting anything.

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Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name YAEL PARDESS **Phone** 323 573 8366

Address 4866 GLENALBYN DR LA CA 90065 **Email** YAELP33@ICLOUD.COM

Comment OUR VERBAL COMMENTS TODAY SHOULD BE TAKEN INTO ACCOUNT!

THE MND DONE BY PASADENA WAS INACCURATE AND DID NOT TAKE INTO ACCOUNT THE MANY NEGATIVE IMPACTS THAT THE WATER FILTRATION PROJECT WILL DO TO THE ENVIRONMENT.

THE EIR MUST BE OBJECTIVE AND NOT COPY & PASTE THE MND'S ~~DATA~~ & CONCLUSIONS. IT MUST ACCURATELY SHOW WATER CONTAMINATION DATA & WHY THE CITY IS NOT TREATING THE POLLUTION AT THE SOURCE. THE DATA MUST BE PRECISE BY LOCATION & ALSO SHOW THE WHOLE ARROYO, AS WELL AS THE GOLF COURSE CONTRIBUTION TO THE CONTAMINATION (~~FERTILISER~~ INCLUDED)

THE EIR MUST ACCURATELY SHOW WHAT WOULD HAPPEN TO AN AREA WHERE A WHOLE FOREST WILL BE DESTROYED. REMAINING FEW TREES WILL NOT SURVIVE THE REMOVAL OF 140+ TREES. A FULL THRIVING ECOSYSTEM WILL COLLAPSE. THIS IS AN IMPORTANT WILDLIFE CORRIDOR. EIR MUST SHOW THAT AS WELL AS ALL THE ANIMALS THAT RELY ON IT

EIR MUST EXPLORE WHAT HAPPENS TO THE DOWNSTREAM AREA AFTER MILLIONS OF GALLONS ARE REMOVED EACH YEAR

EIR MUST EXPLORE ALTERNATIVE SITES THAT DO NOT REQUIRE ANY TREE REMOVAL. EIR MUST ANSWER WHAT HAPPENS TO THE RIVER RESTORATION PLANS & FISH RE-INTRODUCTION.

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Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Pilar Reynaldo **Phone** 213-598-0919

Address _____ **Email** meripli m@gmail.com

Comment I Love everything about this project.

I would like to know if the maintenance of the ~~pilot~~ areas ~~will~~ is built into the cost of the project?

Thank you for beautifying neglected areas in a space I enjoy several times a week

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Comment Sheet

Arroyo Seco Water Reuse Project
Scoping Meeting
May 28, 2025

PASADENA

City of SOUTH PASADENA

Name Clara Solis **Phone** (323) 422-6446

Address 521 N Av 67, LA CA 90042 **Email** claramsolis@earthlink.net

Comment I oppose the project as proposed. A bat study should be conducted at both sites for the EIR. The study should look for bats at appropriate times. The Environmental Impact Report should study:

How will this project impact real nature-based stream restoration that is currently being studied by LA County for the Arroyo Seco between the Devil's Gate Dam and the LA River Confluence? Will it preclude it between the San Rafael Creek and York Blvd?

Study whether & how much contamination is coming off the South Pasadena Golf course into the stream. Will the water be cleaned above it and then recontaminated by the golf course,

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Better alternatives

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Jabz Alejandro Email Address:

Address:

Signature: [signature] Date: 05-24-25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Katrina Alexy
Sent: Friday, May 23, 2025 8:36 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Support for Arroyo Seco Water Reuse Project

Dear Ms. Monde,
I wholeheartedly support the plans to restore and revive the watershed areas near San Pasqual Park.
As someone who was born and raised in LA and spends every day walking the Lower Arroyo, I am afraid to walk by the San Pasqual stretch due to a serious homeless encampment there in the overgrown invasive plant area near the wash. There have been several fires there and so much trash.
The plan to revive that area, provide native planting, a safe walking path, a more efficient and safer water delivery system, and a much more beautiful vista is welcome!
I live in Highland Park and truly hope this vision comes to pass! We need and appreciate this beautiful plan for San Pasqual. We welcome this advancement and support the Arroyo Seco Water Reuse Project moving forward wholeheartedly. Thank you!
Sincerely, Katrina Alexy

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

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( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

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( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

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( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

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EIR must also include:

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( ) Additional comments:

Name: Gabriel Alfaro So Email Address: [redacted]

Address: [redacted]

Signature: Gabriel Alfaro Date: 05/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: Isabella Alvarez Email Address:

Address:

Signature: [signature] Date: 6/14/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

South Pasadena City Council Meeting, 6/18/25
Public Comment, Non-agenda Item
Arroyo Seco Watershed Restoration

Thank you, city council and staff for the opportunity to speak here. As you all know from my many appearances, and my work in the nature park, I am committed to a restored and living Arroyo Seco. Today, rather than once again telling you what I think is wrong with the Arroyo Seco Water Reuse Project, I'd like to paint a picture of what we could have instead.

This is not some unrealistic, pie-in-the-sky dream. The Army Corps of Engineers worked for years with LA Co Flood Control and the cities along the Arroyo to study the feasibility of restoring it. Millions of dollars have been spent on this, and the consensus is that we do not have to accept an ugly, degraded channelized sewer for the sake of flood protection.

The park land along the Arroyo Seco opens the possibility of allowing the river to flow and even flood in places, as it always has. So imagine our city working with our neighbors along the Arroyo to chip away as this degraded channel – which is in dire need of repair and upgrade. There is the money because repairing the channel would cost untold millions/billions, and doing nothing leaves us vulnerable to vastly more costly destruction. There are ideas – Army Corps, Stillwater Sciences, North East Trees, Stewards of the Arroyo Seco, and more have presented concept plans.

Stop and visualize this. The Arroyo Seco diversion – that little wooded wildland and creek – could be ground zero for releasing the Arroyo Seco from its awful, concrete straitjacket. It could be the model for continued work along the Arroyo from the mountains on down to its confluence with the LA River.

Instead of buried pumps and lined wetlands – all requiring maintenance – we could start by cleaning up the garbage and the invasives, and opening the area to the public with a system of small trails. Kids and their parents could stop by after a Little League game to see the tadpoles, frogs, turtles and birds who call this cool & refreshing spot home.

You might say, but we can't leave all of the garbage and pollution in the water, and I agree. Let's first determine what we have to deal with – we need current water quality tests. Then let's figure out where it is coming from and see whether we can remove it before it enters the system. Let's employ nature-based solutions like bioswales and infiltration basins.

The Water Reuse project will not just remove some big old trees, it will scrape the ground of all of its organisms, kill the diverted creek, and leave all of the animals that rely on it to die. Where will the birds and the rest go during the 17 or so months of destruction and construction? They will not come back and this incredibly unique gift that we have in South Pasadena will be gone forever.

Barbara Eisenstein, 1852 Monterey Road, Friends of SP Nature Park

Friends of
SOUTH PASADENA
NATURE PARK

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: Bottom Herrera Email Address:

Address:

Signature: Date: 06/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

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(✓) Additional comments: How is this legal? Don't give a half acre of parkland away for this. South Pasadena should give us parkland

Name: Sylvia Bedell Email Address:

Address:

Signature: Sylvia Bedell Date: 6/27/23

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Vicky Bermudez
Sent: Monday, May 26, 2025 2:59 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Public Comment Opposing the Arroyo Seco Water Reuse Project – San Pascual and San Rafael Sites

Dear Ms. Monde,

Please find below my written public comment regarding the proposed Arroyo Seco Water Reuse Project.

As a resident of the area directly impacted by the proposed Arroyo Seco Water Reuse Project—specifically the developments planned at San Pascual and San Rafael—I am writing to express my strong opposition to the project in its current form. The Environmental Impact Report (EIR) process must fully and transparently evaluate the consequences this project will have on our environment, community, and cultural heritage.

I have serious concerns regarding the following:

1. **Destruction of Natural Habitat and Mature Trees**
   The project will result in the destruction of over 140 mature trees and disrupt a thriving ecosystem that supports local wildlife. This loss is irreversible and inconsistent with our community's goals of preserving green space and biodiversity.
2. **Environmental Justice and Community Outreach Failures**
   There has been inadequate outreach to the residents of Los Angeles who will be directly affected, particularly those who use and care for San Pascual Park. The public deserves more transparency and an equitable opportunity to voice concerns—something this project has thus far failed to provide.
3. **Water Diversion for Private Use**
   Diverting 20 million gallons of water from the Arroyo Seco channel annually to irrigate a private golf course in South Pasadena—without benefit to the broader community—reflects poor stewardship of a public resource. It also raises serious ethical and environmental concerns regarding water equity, especially during a time of increasing climate instability.
4. **Disrespect to Indigenous Heritage**
   The land in question includes sacred sites connected to the Kizh Nation, including potential burial grounds. The fact that these communities were not consulted is a profound oversight and a violation of principles of cultural respect and historical justice.
5. **Lack of Transparency Regarding Pollution Mitigation**
   There is no clear explanation as to how Pasadena plans to treat its polluted water before diverting it into another community's parkland. This omission raises alarm over water safety, environmental degradation, and accountability.
6. **Alternative Solutions Ignored**
   Viable alternative water treatment and reuse strategies exist that could meet Pasadena's needs while minimizing environmental and community harm. These must be properly explored in the EIR.

I urge the City of Pasadena to reconsider this project and work collaboratively with local residents, environmental experts, and Indigenous communities to identify solutions that prioritize ecological integrity, public benefit, and cultural respect.

At the very least, the City must provide a **comprehensive Environmental Impact Report** that addresses all concerns noted above, as recently settled in related litigation. Anything less would represent a failure of due diligence, community responsibility, and ethical planning.

Thank you for your time and consideration.

Sincerely,

Victoria Bermudez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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(X) Additional comments:

Name: Nathan Bignell Email Address:

Address:

Signature: Date: 6/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: Dora Bl Email Address:

Address:

Signature: Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

24 June 2025

Dear Christina Monde:

I am a Restoration and Conservation Ecologist with eight years of professional experience, having published 13 peer-reviewed studies. I am writing to voice my concerns about the biological resources component of the Arroyo Seco Water Reuse Project. In particular, there is a lack of discussion about the maintenance and monitoring of the proposed landscaping in the Draft Initial Study/Mitigated Negative Declaration of the Arroyo Seco Water Reuse Project document (page numbers indicated below are from this document).

1. Maintenance of the newly planted landscaping. It appears there are no plans to replace planted trees or groundcover that do not survive. Successful planting projects require a multi-year commitment to maintaining the planted vegetation (Brancalion & Holl, 2020). It additionally appears that there are no plans to manage non-native species after the plantings are in place. It is likely that invasive, non-native species would once again proliferate following the planting. Replacement plants and weed management should be included in the budget and maintenance plan.
2. Maintenance of the irrigation lines supplying the landscaping. Pages 1-12 and 2-77 indicate that "after the landscaping is established the on-site irrigation infrastructure would be removed but the water line would remain as a quick connection point in the event of extended drought conditions, "hot spots" in the landscape that require temporary supplemental water, and/or for maintenance needs." However, there is no indication of how it will be determined that the "landscaping is established" or on what timeline this is expected to occur. In the event of an extended drought or the presence of "hot spots" that require supplemental water after the water line has been disconnected, what agencies are responsible for making the call to connect the water lines and then completing that action? What agencies are responsible for the maintenance of these irrigation lines?
3. Monitoring of the proposed landscaping. On page 2-21 goals for the biological resources of the Project area are stated: "the Project is expected to result in a net benefit to coast live oak-western sycamore woodland vegetation and other riparian habitat areas and improve overall habitat functions and values for native species of the region." These goals must be accompanied by relevant success criteria and regular monitoring to ascertain alignment with those criteria. If there are defined success criteria, I could not locate them in the document. Regardless, if the success criteria are not tracked over time through regular, long-term monitoring then it is not possible to assess the outcome of the Project on biological resources (Gann et al., 2019, p. 62).

For there to be a net benefit to the habitat there must be maintenance and monitoring of the newly planted landscape. Maintenance and monitoring must be appropriately included in the budget, coordinated across agencies, conducted over multiple years, and be shaped by well-defined success criteria.

Sincerely,

Laurel Brigham, Ph.D.

References

Brancalion, P. H., & Holl, K. D. (2020). Guidance for successful tree planting initiatives. *Journal of Applied Ecology*, *57*(12), 2349-2361.

Gann, G. D., McDonald, T., Walder, B., Aronson, J., Nelson, C. R., Jonson, J., ... & Dixon, K. (2019). International principles and standards for the practice of ecological restoration. *Restoration ecology*, *27*(S1), S1-S46.

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(X) The loss of a local cherished community parkland including the loss of access to the water.
(X) Removal of a water source that is currently supporting local wildlife.
(X) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(X) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(X) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(X) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(X) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(X) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(X) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(X) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(X) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(X) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(X) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(X) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(X) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(X) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(X) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(X) An alternative that seeks input from community members and takes this information into consideration.
(X) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(X) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(X) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(X) Additional comments:

Name: HOLLY BRIX Email Address: _

Address: _____

Signature: Holly Brix Date: May 24, 2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: S B
Sent: Monday, June 30, 2025 12:20 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Re: Public Comment Opposing the Arroyo Seco Water Reuse Project — Protect Historic Equestrian & Multi-Use Corridors, Uphold County and State Standards, Advance Mobility Justice

Dear Ms. Monde and Members of the Department of Public Works,

I submit this public comment on behalf of Avocado Heights Vaquerxs by the June 30, 2025 deadline to strongly oppose the Arroyo Seco Water Reuse Project in its current form. This project places in grave danger one of Southern California's oldest and most culturally significant multi-use and equestrian corridors — violating both County and State-adopted trail standards, failing to uphold the legacy of Rancho-era land use planning that explicitly recognized equestrian mobility, and threatening to erase long-standing pathways of Indigenous and working-class transit and recreation.

A corridor with deep historic roots — from Indigenous stewardship to Rancho land grants to modern trail systems

Long before any modern city boundaries existed, the Arroyo Seco served as a natural transportation corridor for Indigenous peoples, including ancestors of the Kizh (Gabrielino) Nation, who relied on these riparian zones for travel, subsistence, and ceremonial routes. The land holds burial grounds and sacred sites still claimed and protected by Kizh descendants today.

Following colonization and secularization, this same corridor became integral to Rancho land grant systems, where vast tracts were explicitly planned to include equestrian mobility — linking ranchos, mission sites, and emerging pueblos. These open routes evolved into early horse trails that later underpinned 19th and early 20th century right-of-way designations, many of which were formally protected in early Los Angeles County planning ordinances.

It is not accidental that Los Angeles County's own General Plans and Community Plans across the San Gabriel Valley repeatedly acknowledge "equestrian trails and staging areas" as historic, protected land uses. This planning lineage — reinforced through ordinances well into the 1970s — treats equestrian corridors not as recreational afterthoughts but as an original form of regional mobility infrastructure, deserving of the same serious stewardship as major roadways.

Modern mobility justice demands preserving historic equestrian and multi-use access

Today, these trails continue to function as essential mobility networks for local equestrians — many of whom are Latino, working-class, and multi-generational residents who sustain charro and vaquero traditions. For these communities, equestrian passage is not a boutique pastime; it is a cultural practice, a form of local transit, and a means of accessing natural and social spaces in neighborhoods where infrastructure otherwise heavily prioritizes cars.

Mobility justice frameworks compel us to defend these corridors. Scholars and planning advocates have documented how mobility justice demands we examine who gets to move safely, by what means, and through whose lands — recognizing that historical exclusions and contemporary racial, economic, and cultural inequities shape who benefits from public infrastructure. In this case, eliminating or degrading equestrian routes through the Arroyo Seco means shutting off an entire mode of culturally rooted mobility that predates — and in fact enabled — the very development of Pasadena and Los Angeles.

Direct conflicts with County and State trail stewardship standards

This project's design fails to uphold multiple binding and guiding standards:

Los Angeles County Trails Manual (2003)

- Section 1.2 (Trail System Goals):
  "Preserve, protect, and enhance existing trail alignments and uses, with special emphasis on equestrian and hiking activities."
- Section 3.2.2 (Trail Width):
  Requires a minimum 8-foot tread width, recommending 10–12 feet for multi-use trails, to accommodate safe passage of mounted riders.
- Section 3.2.3 (Vertical Clearance):
  Requires at least 10 feet of vertical clearance to ensure mounted equestrians can safely pass under any overhead structures or tree canopy.
- Section 4.1 (Vegetation Management):
  Directs that "native trees and significant vegetation should be preserved whenever possible," directly contradicting plans to cut 140+ mature trees integral to trail microclimates and stability.
- Section 2.2 (Cultural Resources):
  Obligates agencies to identify and avoid disturbance to Native American sacred sites and traditional use areas — obligations that have not been adequately met through consultation with the Kizh Nation.

California State Parks Trail Handbook (2007) & California DPR Trails Manual

- Trail Handbook Section 5.2:
  Recommends 10–12 foot tread widths for shared-use trails with equestrians, maintaining native vegetation and shade to ensure user-friendly and sustainable conditions. Calls for tread materials that are "firm, stable but non-slip surfaces such as compacted native soil or decomposed granite," directly threatened by this project's heavy engineered footprint.
- DPR Trails Manual Chapter 4 (Trail Construction & Maintenance):
  Emphasizes minimal disturbance of ecosystems, contour-following alignments to minimize grading and erosion, and discourages unnecessary clearing of mature canopy — all standards that would be violated by extensive basin excavation and tree removal.

Ignoring these well-established statewide best practices undermines the basic principles of safe, sustainable equestrian and multi-use access throughout California.

Additional equestrian-specific risks documented in Pasadena's own project scoping

Pasadena's own EIR Scoping documents highlight further hazards that have not been adequately mitigated:

- No firm assurances on continuous, safe equestrian passage:
  References to keeping trails "open during construction" lack binding commitments to maintaining proper width, vertical clearance, or natural tread — risking unsafe, narrow, or incomplete routes.
- Dust, noise, and heavy equipment stress:
  Horses are highly vulnerable to respiratory irritants and loud mechanical sounds. The project documents provide no dedicated dust suppression measures, noise control plans, or scheduling limits to protect equestrian users.
- Significant water diversion altering riparian trail conditions:
  With up to 175 million gallons annually diverted away, local banks and riparian soils may become dry, more erosion-prone, and harder for hooves, increasing dust and long-term trail degradation.
- No durable maintenance provisions:
  There is no funding guarantee for post-construction grading, erosion repairs, or vegetation management essential to keeping these trails safely passable for equestrian and multi-use purposes.

This is a question of cultural continuity, mobility equity, and legal stewardship

Eliminating or diminishing the Arroyo Seco's historic equestrian corridors breaks a chain of cultural continuity stretching from pre-colonial Indigenous routes, through Rancho-era horse networks, into modern protected multi-use trails. It fails our County's own land use commitments, violates recognized State trail best practices, and perpetuates environmental and mobility injustices that fall hardest on communities who have long relied on these corridors.

What we ask

We urge the City of Pasadena and Los Angeles County to halt this project in its current form and instead:

- Fully uphold County and State trail standards, protecting multi-use and equestrian corridors by maintaining appropriate widths, clearances, and natural surfaces before, during, and after construction.
- Guarantee dust control, equipment scheduling, and clear detour planning that specifically protects mounted riders and equestrian groups.
- Engage the Kizh Nation as rightful stewards in any decision involving disturbance of sacred lands.
- Ensure long-term, enforceable maintenance agreements to keep these trails safely graded, vegetated, and accessible.

- Explore alternative green infrastructure or distributed stormwater approaches that protect these historic mobility corridors while still achieving water quality goals.

San Pascual Park and the Arroyo Seco are far more than urban parkland. They are living corridors of Indigenous history, Rancho land grant planning, equestrian mobility, and cultural celebration. Compromising them for narrowly framed engineering benefits, largely benefiting external interests such as a South Pasadena golf course, is to trade away irreplaceable heritage and equitable access for short-term infrastructure gains.

Thank you for considering these critical concerns and for upholding the cultural, ecological, and mobility legacies entrusted to your stewardship.

Respectfully submitted,

Samuel Brown

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

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EIR must also include:

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Robert L. Burrescia Email Address:

Address:

Signature: Robert L. Burrescia Date: 5/24/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Old Focals
Sent: Thursday, May 22, 2025 3:32 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: South Pasadena resident in favor of watershed

Dear Christina,
I support you and your efforts.
As a resident of South Pasadena, the importance of preserving the arroyo is of upmost concern to those of us who utilize it.
Russell Campbell

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Wendy Carrillo Email Address

Address:

Signature: Wendy Carrillo Date: 06.14.25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

June 27, 2025

Christina Monde
City of Pasadena
100 N Garfield Ave
Pasadena, CA 91101
CMonde@cityofpasadena.net

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Arroyo Seco Water Reuse Project, SCH No. 2023110605, Los Angeles County, CA

Dear Christina Monde:

The California Department of Fish and Wildlife (CDFW) reviewed the Notice of Preparation (NOP) from City of Pasadena (City) for the Arroyo Seco Water Reuse Project (Project) pursuant to the California Environmental Quality Act (CEQA) and CEQA Guidelines[1].

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, CDFW appreciates the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Fish & G. Code, § 1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW may also act as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority (Fish & G. Code, § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law[2] of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.) or the Native Plant Protection Act (NPPA; Fish & G. Code, §1900 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

PROJECT DESCRIPTION SUMMARY

Proponent: City of Pasadena

Objective: According to the MND, the proposed Project would develop two regional stormwater capture and treatment facilities (man-made treatment wetlands and infiltration basins), which would be located near the Arroyo Seco Channel (Arroyo Seco). Additionally, an off-site water harvester and related infrastructure would be installed within the existing, gated maintenance yard at the public Arroyo Seco Golf Course in South Pasadena. For both sites, the Project would include native landscaping; hardscape elements, including reclaimed wood log benches, post-and-rail fencing, and concrete seat walls faced with natural stone; informational signage; and the expansion of the existing trail network.

On July 9, 2010, the Los Angeles Regional Water Quality Control Board adopted resolution No. R10-007 incorporating a total maximum daily load (TMDL) for indicator bacteria in the Los Angeles River watershed. A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody and not affect that waterbody's ability to meet and maintain water quality standards. Outfalls along the Arroyo Seco were modeled for indicator bacteria and the San Rafael Creek outfall was identified as a priority outfall; these outfalls have routine problematic discharges that drive the total bacteria load.

Runoff in San Rafael Creek would be diverted into the San Rafael site, pre-treated, and a portion of the water would be infiltrated for groundwater recharge. The portion not infiltrated would be treated, discharged into the Arroyo Seco, and then diverted downstream into the San Pascual site for infiltration and additional treatment prior to discharge back to the Arroyo Seco. The operation of these two regional stormwater management sites would result in an annual average water supply of 320 acre-feet (af). Of this, there would be approximately 258 af of groundwater recharge and approximately 30 af (or less than 10 percent of captured water) would be captured off-site for irrigation reuse at the golf course to reduce potable water demand.

[2] "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

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Location: The Project site encompasses approximately 3.7 acres on two sites in the Lower Arroyo Seco that are situated adjacent to the Arroyo Seco – the northern, San Rafael site (1.5 acres) in the City of Pasadena; and the southern, San Pascual site (2.2 acres), in the cities of South Pasadena and Los Angeles.

The San Rafael site is situated southwest of the San Rafael Avenue overpass of the Arroyo Seco, on the west side of the Arroyo Seco, and adjacent to Pasadena's southern boundary. The San Rafael site includes a linear feature that is within the limits of the San Rafael Creek easement under Los Angeles County Flood Control District jurisdiction. The San Pascual site is situated southeast of the San Pascual Avenue overpass of the Arroyo Seco and on the east side of the Arroyo Seco. The San Pascual site is bound by San Pascual Avenue on the north and Stoney Drive on the east. The sites are regionally accessible via State Route 134 (SR 134), which is located approximately 1.25 miles north of the San Rafael site; and SR 110, which is located approximately 0.10 mile south of the San Pascual site.

Runoff from this watershed drains to and runs through over 50 linear miles of the Los Angeles River and then to the Pacific Ocean. The Arroyo Seco is a major tributary to the Los Angeles River.

Biological Setting: The Project site encompasses a variety of vegetation communities, many of which are disturbed. These include coast live oak (*Quercus agrifolia*) woodland, coast live oak–western sycamore (*Platanus racemosa*) woodland, and mixed stands of Peruvian pepper tree (*Schinus molle*) with coast live oak. Additional vegetation types present are non-native ornamental woodland and disturbed blue elderberry (*Sambucus cerulea*)–laurel sumac (*Malosma laurina*) scrub. Portions of the site also contain non-native grasslands characterized by the brome–Schismus (*Bromus rubens–Schismus arabicus, Schismus barbatus*) Herbaceous Semi-Natural Alliance. Areas of bare ground and developed land are also present throughout the site.

Several species of potential concern may be present on or near the site. These include California Species of Special Concern (SSC), such as the big free-tailed bat (*Nyctinomops macrotis*), western yellow bat (*Lasiurus xanthinus*), western mastiff bat (*Eumops perotis californicus*), pallid bat (*Antrozous pallidus*), Southern California legless lizard (*Anniella stebbinsi*), and coast range newt (*Taricha torosa*).

In terms of rare plants, California black walnut (*Juglans californica*), classified as California Rare Plant Rank (CRPR) 4.2, is present on-site. In the broader Project vicinity, additional species of concern include CRPR 4.2 Coulter's matilija poppy (*Romneya coulteri*) and Nevin's barberry (*Berberis nevinii*), which is listed as endangered under the California Endangered Species Act (CESA) and ranked CRPR 1B.1.

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COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist the City in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

Specific Comments

1) **Rare Plants**. California black walnut and Coulter's matilija poppy both have a CRPR of 4.2 and Nevin's barberry is CESA-listed with a CRPR of 1B.1. Plants with a CRPR of 1B, 2A, and 2B are rare throughout their range, endemic to California, and are seriously or moderately threatened in California. All plants constituting CRPR 1A, 1B, 2A, and 2B should have impacts to these species or their habitat must be analyzed during preparation of environmental documents relating to CEQA, as they meet the definition of rare or endangered (CEQA Guidelines, § 15380). California Native Plant Society's (CNPS) Rare Plant Ranks page includes additional rank definitions (CNPS 2023).

   CDFW recommends conducting focused surveys for rare plants. The survey should be conducted on site and in the surrounding 200-foot buffer. Based on the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2021), a qualified biologist should "conduct botanical surveys in the field at the times of year when plants will be both evident and identifiable. Usually this is during flowering or fruiting." The biological assessment should provide a thorough discussion on the extent of sensitive species and identify measures to protect sensitive plant communities from Project-related direct and indirect impacts.

   a. Disclosure. The DEIR should fully disclose any impacts on rare plants, which should include, at a minimum, where impacts would occur; number of individual plants impacted; population size and density; and acres of habitat/plant communities impacted.

   b. Avoidance. If the Project will impact rare plants, CDFW recommends the DEIR provide measures to fully avoid impacts on rare plants and its habitat. This may include Project alternatives that would fully avoid impacts on rare plants.

   c. Mitigation. If take or adverse impacts to rare plants cannot be avoided during Project activities or over the life of the Project, the DEIR should provide measures to mitigate those impacts. CDFW recommends the City provide compensatory mitigation for loss of rare plants and habitat. CDFW recommends the City identify an appropriate site to preserve rare plants in perpetuity.

   d. CESA. CDFW considers adverse impacts to a species protected by CESA to be significant. Take of any endangered, threatened, candidate species, or NPPA-listed plant species that results from the Project is prohibited, except as authorized by state law (Fish & G. Code, §§ 2080, 2085; Cal. Code Regs., tit. 14,

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§786.9). Consequently, if the Project or any Project-related activity will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, CDFW recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project. Appropriate authorization from CDFW may include an Incidental Take Permit (ITP) or a consistency determination in certain circumstances, among other options (Fish & G. Code, §§ 2080.1, 2081, subds. (b) and (c)). Early consultation is encouraged, as significant modification to a Project and mitigation measures may be required to obtain a CESA Permit.

To ensure CDFW will be able to use the City's CEQA document for the issuance of an ITP, the DEIR should address all Project impacts to CESA-listed species and specify a mitigation, monitoring, and reporting program that will meet the requirements of an ITP.

2) **Bats**. Numerous bat species are known to be in the Project area, including those designated as SSC's. In urbanized areas, bats use trees and man-made structures for daytime and nighttime roosts. Accordingly, CDFW recommends the DEIR provide measures so the Project avoids potential impacts to bats.

   a. Bats are considered non-game mammals and are afforded protection by state law from take and/or harassment (Fish & G. Code, § 4150; Cal. Code of Regs., § 251.1). Project construction and activities, including (but not limited to) ground disturbance, vegetation removal, and any activities leading to increased noise levels may have direct and/or indirect impacts on bats and roosts.

   b. CDFW recommends a qualified bat specialist conduct bat specific surveys at an appropriate time of day, when bats are most active, within the Project site (plus a 100-foot buffer as access allows) in order to identify potential habitat that could provide daytime and/or nighttime roost sites, and any maternity roosts. Acoustic recognition technology shall be utilized to maximize detection of bat species and to minimize impacts to sensitive bat species. A discussion of survey results, including negative findings should be provided to the City. Depending on the survey results, a qualified bat specialist should discuss potentially significant effects of the Project on bats and include species specific mitigation measures to reduce impacts to below a level of significance (CEQA Guidelines, § 15125). Surveys, reporting, and preparation of robust mitigation measures by a qualified bat specialist should be completed and submitted to the City prior to any Project-related ground-disturbing activities or vegetation removal at or near locations of roosting habitat for bats.

3) **Reptiles and Amphibians**. The Project will require ground disturbing activities such as grading and grubbing, which may result in reptile and/or amphibian habitat destruction, causing the death or injury of adults, juveniles, eggs, or hatchlings. Southern California legless lizard and coast range newt have potential to be on the Project site. Moreover, the Project may remove habitat for these species by

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eliminating vegetation that may support essential foraging and breeding habitat.

CDFW recommends qualified biologists familiar with the reptile species behavior and life history conduct focused surveys to determine the presence/absence of SSC prior to vegetation removal and/or grading. Surveys should be conducted during active season when each reptile species are most likely to be detected.

To further avoid direct mortality, CDFW recommends that a qualified biological monitor be on site during ground and habitat disturbing activities to move out of harm's way special status species that would be injured or killed by grubbing or Project-related grading activities. It should be noted that the temporary relocation of on-site wildlife does not constitute effective mitigation for the purposes of offsetting Project impacts associated with habitat loss.

4) **Fish Habitat**. Project implementation may result in substantial adverse effect to biological function for fish species. Fish and Game Code section 5901 makes it unlawful to construct or maintain in any streams any device that prevents, impedes, or tends to prevent or impede the passing of fish up and downstream. CDFW recommends the DEIR should include a thorough and complete survey by a qualified biologist during the spawning season (spring/summer) to determine that Project activities do not prevent or impede fish passage during low flow conditions. CDFW also recommends the DEIR provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, especially fish species, with specific measures to offset such impacts.

   In addition, and as applicable, Fish and Game Code, section 5937 requires the owner of any dam to allow sufficient water at all times to pass through a fishway or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam. CDFW also recommends the DEIR provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, especially fish species, with specific measures to offset such impacts. The following should be addressed in the DEIR.

   a. A discussion of potential adverse impacts from human activity, exotic species, and drainage should also be included. The latter subject should address Project-related changes on drainage and sedimentation patterns on and downstream of the Project site; the volume, velocity, and frequency of existing and post-project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-project fate of runoff from the Project site. Impact analysis should also address any interruption of sediment transport caused by the diversion structure. Impeding sediment transport within the stream can have impacts to fish habitat both upstream and downstream of the dam structure.

   b. The discussions should also address the proximity of the extraction activities to the water table, whether dewatering would be necessary, and the potential

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resulting impacts on the habitat, if any, supported by the groundwater. Mitigation measures proposed to alleviate such impacts should be included.

5. **Lake and Streambed Alteration**. The Project would directly impact the Arroyo Seco. As a Responsible Agency under CEQA, CDFW has authority over activities in streams that will divert or obstruct the natural flow; or change the bed, channel, or bank (including associated vegetation) of a stream; or use material from a streambed. For any such activities, the project applicant must provide written notification and other information, CDFW determines whether an LSA Agreement (LSAA) with the applicant is required prior to conducting the proposed activities. CDFW's issuance of an Agreement for a project that is subject to CEQA will require related environmental compliance actions by CDFW as a Responsible Agency. As a Responsible Agency, CDFW may consider the CEQA document prepared by the City for the Project. To minimize additional requirements by CDFW pursuant to section 1600 *et seq.* and/or under CEQA, the DEIR should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSAA. A Notification package for a LSAA may be obtained by accessing CDFW's Lake and Streambed Alteration Program website.

   The notification should provide a Water Availability Analysis to determine if water can be diverted without causing substantial adverse effects on downstream wildlife resources. The Applicant should also provide an Instream Flow Study to determine the minimum bypass flows needed and maximum rates of withdrawal possible to provide adequate depths and velocities to protect habitat for all life stages of aquatic resources. At a minimum, the analysis should provide the following:

   a. Defined extent of upstream and downstream reach of Arroyo Seco that may be directly and indirectly affected by the proposed Project and assess potential project-related impacts on biological resources within this study reach. Please include and address any potential impacts on groundwater dependent ecosystems and sensitive species and habitats that occur.

   b. An analysis of potential project-related changes to river hydraulics in both concrete and soft-bottom reaches. This includes water depth (percent change), wetted perimeter (acres gained/lost), and velocity (percent change). Comparing total wetted area may be useful in quantifying the effects on groundwater dependent ecosystems, assuming that infiltration rates are proportional to wetted area.

   c. CDFW recommends using a two-dimensional hydraulic model of proposed versus existing habitat to determine whether habitat changes are expected and, if so, to what degree.

   d. A map of potential changes to channel hydraulics overlain on a map of plant communities and habitat for sensitive wildlife species and birds.

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e. A discussion of project-related impacts on biological resources in relation to changes in hydrology throughout the reach. The DEIR should provide a diversion rate analysis including a dynamic baseline analysis of flow and volume based on the existing hydrograph for flows in the Arroyo Seco and Los Angeles River. This information will provide an understanding of the current baseflow and the effects of the proposed diversion rate. This is necessary to understand how the public trust resources that depend on the current conditions will be impacted by the Project. Current conditions (before the proposed Project's diversions) are established as the baseflow that currently supports the quality and quantity of downstream aquatic resources in the Arroyo Seco and Los Angeles River.

f. CDFW recommends using Normalized Difference Vegetation Index and Normalized Difference Moisture Index to assess habitat health for the reach on an annual basis. If degradation of habitat occurring is observed, additional mitigation measures should be incorporated and enacted to offset indirect impacts.

6. **Water Right**. The DEIR should provide clear information on any water right permit(s) possessed by the Project proponent for the proposed Project. The description should include the water right's license number, diversion rate requirement, amount, and any other pertinent information. If the Project proponent does not have a water right for the Project, the DEIR should include information on whether the Project proponent will be applying for one and what coverage they would see under a water right permit.[3]

   The proposed appropriation of water may result in cumulative adverse impacts to environmental and public trust resources within the Arroyo Seco and Los Angeles River. The DEIR should provide a water budget to consider the Project's significant impacts to the downstream functions and health of the Arroyo Seco and Los Angeles River as well as the resources it supports. The water budget should also consider reasonably foreseeable restoration projects, some of which support steelhead passage to maintain sufficient flows for both juvenile and adult steelhead to migrate between the tributaries of the Los Angeles River and the Pacific Ocean (see comment #4 above). Flow reductions could have a significant impact on downstream biological resources and foreseeable restoration projects, especially during the dry season proceeding below-average water years.

[3] The use of unallocated stream flows is subject to appropriation and approval by the State Water Resources Control Board pursuant to Water Code, section 1200 et seq. CDFW, as a Trustee Agency, is consulted by the State Water Resources Control Board during the water rights process to provide terms and conditions designated to protect fish and wildlife prior to appropriation of the State's water resources. Certain fish and wildlife are reliant upon aquatic ecosystems, which in turn are reliant upon adequate flow of water. CDFW therefore has a material interest in assuming that adequate flows are present within streams for the protection, maintenance, and proper stewardship of those resources. CDFW provides, as available, biological expertise to review and comment on environmental documents and impacts arising from Project activities.

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General Comments

1) **Disclosure**. The DEIR should provide an adequate, complete, and detailed disclosure about the effects which a proposed project is likely to have on the environment (Pub. Resources Code, § 20161; CEQA Guidelines, § 15151). Such disclosure is necessary so CDFW may provide comments on the adequacy of proposed avoidance, minimization, or mitigation measures, as well as assess the significance of the specific impact relative to plant and wildlife species impacted (e.g., current range, distribution, population trends, and connectivity).

2) **Project Description and Alternatives**. To enable adequate review and comment on the proposed Project from the standpoint of the protection of fish, wildlife, and plants, CDFW recommends the following information be included in the DEIR.

   a. A complete discussion of the purpose and need for, and description of the proposed Project.

   b. A range of feasible alternatives to the Project location to avoid or otherwise minimize direct and indirect impacts on sensitive biological resources and wildlife movement areas. CDFW recommends the City select Project designs and alternatives that would avoid or otherwise minimize direct and indirect impacts on biological resources. CDFW also recommends the City consider establishing appropriate setbacks from sensitive and special status biological resources. Setbacks should not be impacted by ground disturbance or hydrological changes from any future Project-related construction, activities, maintenance, and development. As a general rule, CDFW recommends reducing or clustering a development footprint to retain unobstructed spaces for vegetation and wildlife and provide connections for wildlife between properties and minimize obstacles to open space.

   c. Project alternatives should be thoroughly evaluated, even if an alternative would impede, to some degree, the attainment of the Project objectives or would be more costly (CEQA Guidelines, § 15126.6). The DEIR shall include sufficient information about each alternative to allow meaningful evaluation, public participation, analysis, and comparison with the proposed Project (CEQA Guidelines, § 15126.6).

   d. Where the Project may impact aquatic and riparian resources, CDFW recommends the City select Project designs and alternatives that would fully avoid impacts to such resources. CDFW also recommends an alternative that would not impede, alter, or otherwise modify existing surface flow, watercourse and meander, and water-dependent ecosystems and natural communities. Project designs should consider elevated crossings to avoid channelizing or narrowing of watercourses. Any modifications to a river, creek, or stream may cause or magnify upstream bank erosion, channel incision, and drop in water level, which may cause the watercourse to alter its course of flow.

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3) **Biological Baseline Assessment**. An adequate biological resources assessment should provide a complete assessment and impact analysis of the flora and fauna within and adjacent to the Project area and where the Project may result in ground disturbance. The assessment and analysis should place emphasis on identifying endangered, threatened, rare, and sensitive species; regionally and locally unique species; and sensitive habitats. An impact analysis will aid in determining the Project's potential direct, indirect, and cumulative biological impacts, as well as specific mitigation or avoidance measures necessary to offset those impacts. CDFW also considers impacts to Species of Special Concern (SSC) a significant direct and cumulative adverse effect without implementing appropriate avoidance and/or mitigation measures. The DEIR should include the following information.

   a. Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region (CEQA Guidelines, § 15125(c)). The DEIR should include measures to fully avoid and otherwise protect Sensitive Natural Communities. CDFW considers Sensitive Natural Communities as threatened habitats having both regional and local significance. Natural communities, alliances, and associations with a State-wide rarity ranking of S1, S2, and S3 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by visiting the Vegetation Classification and Mapping Program - Natural Communities webpage[4].

   b. A thorough, recent, floristic-based assessment of special status plants and natural communities following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*[5]. Botanical field surveys should be comprehensive over the entire Project area, including areas that will be directly or indirectly impacted by the Project. Adjoining properties should also be surveyed where direct or indirect Project effects could occur, such as those from fuel modification, herbicide application, invasive species, and altered hydrology. Botanical field surveys should be conducted in the field at the times of year when plants will be both evident and identifiable. Usually, this is during flowering or fruiting. Botanical field survey visits should be spaced throughout the growing season to accurately determine what plants exist in the Project area. This usually involves multiple visits to the Project area (e.g., in early, mid, and late season) to capture the floristic diversity at a level necessary to determine if special status plants are present.

   c. Floristic alliance- and/or association-based mapping and vegetation impact assessments conducted in the Project area and within adjacent areas. The Manual of California Vegetation[6], second edition, (Sawyer, Keeler-Wolf, & Evens,

[4] https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities
[5] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline
[6] https://vegetation.cnps.org/

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2009) should also be used to inform this mapping and assessment. Adjoining habitat areas should be included in this assessment where the Project's construction and activities could lead to direct or indirect impacts offsite.

d. A complete and recent assessment of the biological resources associated with each habitat type in the Project area and within adjacent areas. A full literature review includes but is not limited to CDFW's California Natural Diversity Database[7] (CNDDB). The CNDDB should be accessed to obtain current information on any previously reported sensitive species and habitat. An assessment should include a minimum nine-quadrangle search of the CNDDB to determine a list of species potentially present in the Project area. A nine-quadrangle search should be provided in the Project's CEQA document for adequate disclosure of the Project's potential impact on biological resources.

e. A complete, recent, assessment of endangered, rare, or threatened species and other sensitive species within the Project area and adjacent areas, including SSC and California Fully Protected Species (Fish & G. Code, §§ 3511, 4700, 5050, and 5515). Species to be addressed should include all those which meet the CEQA definition of endangered, rare, or threatened species (CEQA Guidelines, § 15380). Seasonal variations in use of the Project area should also be addressed such as wintering, roosting, nesting, and foraging habitat. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, may be required if suitable habitat is present. See CDFW's Survey and Monitoring Protocols and Guidelines[8] for established survey protocol. Acceptable species-specific survey procedures may be developed in consultation with CDFW and U.S. Fish and Wildlife Service.

f. A recent wildlife and rare plant survey. A lack of records in the CNDDB does not mean that rare, threatened, or endangered plants and wildlife do not occur. Field verification for the presence or absence of sensitive species is necessary to provide a complete biological assessment for adequate CEQA review (CEQA Guidelines, § 15003(i)). CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed Project may warrant periodic updated surveys for certain sensitive taxa, particularly if Project implementation build out could occur over a protracted time frame or in phases.

4) **Direct and Indirect Impacts on Biological Resources**. The DEIR should provide a thorough discussion of direct and indirect impacts expected to affect biological

[7] https://wildlife.ca.gov/Data/CNDDB
[8] https://wildlife.ca.gov/conservation/survey-protocols

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resources with specific measures to offset such impacts. The DEIR should address the following.

a. A discussion of potential impacts from lighting, noise, temporary and permanent human activity, and exotic species, and identification of any mitigation measures. A discussion regarding Project-related indirect impacts on biological resources. These include resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands (e.g., preserve lands associated with a Natural Community Conservation Plan (Fish & G. Code, § 2800 et. seq.)).

b. A discussion of both the short-term and long-term effects of the Project on species population distribution and concentration, as well as alterations of the ecosystem supporting those species impacted (CEQA Guidelines, § 15126.2(a)).

c. Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in areas adjacent to the Project, should be fully analyzed and discussed in the DEIR.

d. A discussion of post-Project fate of drainage patterns, surface flows, and soil erosion and/or sedimentation in streams and water bodies. The discussion should also address the potential water extraction activities and the potential resulting impacts on habitat supported by the groundwater. Measures to mitigate such impacts should be included.

e. An analysis of impacts from proposed changes to land use designations and zoning, and existing land use designation and zoning located nearby or adjacent to natural areas that may inadvertently contribute to wildlife-human interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the DEIR.

5) **Cumulative Impact**. Cumulative impacts on biological resources can result from collectively significant projects which are individually insignificant. The Project, when considered collectively with prior, concurrent, and probable future projects, may have a significant cumulative effect on biological resources. The Project may have the potential to substantially reduce the number or restrict the range of endangered, rare, or threatened species. Species that may be impacted by the Project include, but are not limited to, the biological resources described in this letter.

Accordingly, CDFW recommends the DEIR evaluate the Project's potential cumulative impacts on biological resources. The Project may have a "significant effect on the environment" if the possible effects of the Project are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Pub. Resources Code, § 21083(b)). The

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City's conclusions regarding the significance of the Project's cumulative impact should be justified and supported by evidence to make those conclusions. Specifically, if the City concludes that the Project would not result in cumulative impacts on biological resources, the City, "shall identify facts and analysis supporting the Lead Agency's conclusion that the cumulative impact is less than significant" (CEQA Guidelines, § 15130(a)(2)).

6) **Nesting Birds**. To avoid impacts to nesting birds, CDFW recommends that clearing of vegetation occur outside of the peak avian breeding season, which general runs from February 1 through September 1 (as early as January 1 for some raptors). If Project construction is necessary during the bird breeding season, a qualified biologist with experience in conducting breeding bird surveys should conduct a nesting bird survey within three days prior to work in the area. If an active nest is identified, a buffer shall be established between the construction activities and the nest so that nesting activities are not interrupted. For the given Project area, CDFW generally recommends a 100-foot buffer from common avian species, 300 feet for listed or highly sensitive, and 500 feet for raptors. The buffer should be delineated by temporary fencing and remain in effect as long as construction is occurring. No Project construction shall occur within the fenced nest zone until the young have fledged, are no longer being fed by the parents, have left the nest, and will no longer be impacted by the Project. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

7) **Mitigation Measures**. Public agencies have a duty under CEQA to prevent significant, avoidable damage to the environment by requiring changes in a project through the use of feasible alternatives or mitigation measures (CEQA Guidelines, §§ 15002(a)(3), 15021). Pursuant to CEQA Guidelines section 15126.4, an environmental document shall describe feasible measures which could mitigate impacts below a significant level under CEQA. Mitigation measures must be feasible, effective, implementable, and fully enforceable/imposed by the lead agency through permit conditions, agreements, or other legally binding instruments (Pub. Resources Code, § 21081.6(b); CEQA Guidelines, § 15126.4).

   a. The DEIR should provide mitigation measures that are specific and detailed (i.e., responsible party, timing, specific actions, location) in order for a mitigation measure to be fully enforceable and implemented successfully via a mitigation monitoring and/or reporting program (Pub. Resources Code, § 21081.6; CEQA Guidelines, § 15097).

   b. If a proposed mitigation measure would cause one or more significant effects, in addition to impacts caused by the proposed Project, the DEIR should include a discussion of the effects of proposed mitigation measures (CEQA Guidelines, § 15126.4(a)(1)). In that regard, the DEIR should provide an adequate, complete, and detailed disclosure about the Project's proposed mitigation measure(s).

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Adequate disclosure is necessary so CDFW may assess the potential impacts of proposed mitigation measures.

8) **Compensatory Mitigation**. The DEIR should include compensatory mitigation measures for the Project's significant impacts (direct and/or through habitat modification) to sensitive and special status plants, animals, and habitats. Mitigation measures should emphasize avoidance and minimization of Project-related impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore inadequate to mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed. Areas proposed as mitigation lands should be protected in perpetuity with a conservation easement and financial assurance and dedicated to a qualified entity for long-term management and monitoring.

9) **Long-term Management of Mitigation Lands**. For proposed mitigation lands, the DEIR should include measures to protect the targeted habitat values in perpetuity. The mitigation should offset Project-induced qualitative and quantitative losses of biological resources. Issues that should be addressed include (but are not limited to) restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion. An appropriate endowment should be set aside to provide for long-term management of mitigation lands.

10) **Translocation/Salvage of Plants and Animal Species**. Translocation and transplantation is the process of removing plants and wildlife from one location and permanently moving it to a new location. CDFW generally does not support the use of translocation or transplantation as the primary mitigation strategy for unavoidable impacts to endangered, rare, or threatened plants and animals. These efforts are experimental, and the outcome is unreliable. CDFW has found that permanent preservation and management of habitat capable of supporting these species is often a more effective long-term strategy for conserving plants and animals and their habitats.

11) **Scientific Collecting Permit**. A Scientific Collecting Permit would be necessary if there is a plan to capture and relocate wildlife. Pursuant to the California Code of Regulations, title 14, section 650, qualified biologist(s) must obtain appropriate handling permits to capture, temporarily possess, and relocated wildlife to avoid harm or mortality in connection with Project-related activities. CDFW has the authority to issue permits for the take or possession of wildlife, including mammals; birds, nests, and eggs; reptiles, amphibians, fish, plants; and invertebrates (Fish & G. Code, §§ 1002, 1002.5, 1003). A Scientific Collecting Permit is required to monitor project impacts on wildlife resources, as required by environmental documents, permits, or other legal authorizations; and, to capture, temporarily possess, and relocate wildlife to avoid harm or mortality in connection with otherwise

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lawful activities (Cal. Code Regs., tit. 14, § 650). For more information, please see CDFW's Scientific Collecting Permit webpage[9].

12) **Wetland Resources**. CDFW, as described in Fish and Game Code section 703(a), is guided by the Fish and Game Commission's (Commission) policies[10]. Through its Wetlands Resources policy, the Commission "…seek[s] to provide for the protection, preservation, restoration, enhancement, and expansion of wetland habitat in California" (California Fish and Game Commission, 2005). It is the policy of the Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion that would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, project mitigation assures there will be 'no net loss' of either wetland habitat values or acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values."

a. The Wetlands Resources policy provides a framework for maintaining wetland resources and establishes mitigation guidance. CDFW encourages avoidance of wetland resources as a primary mitigation measure and discourages the development or type conversion of wetlands to uplands. CDFW encourages activities that would avoid the reduction of wetland acreage, function, or habitat values. Once avoidance and minimization measures have been exhausted, a project should include mitigation measures to assure a "no net loss" of either wetland habitat values, or acreage, for unavoidable impacts to wetland resources. Conversions include, but are not limited to, conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks, which preserve the riparian and aquatic values and functions benefiting local and transient wildlife populations. CDFW recommends mitigation measures to compensate for unavoidable impacts be included in the DEIR and these measures should compensate for the loss of function and value.

b. The Fish and Game Commission's Water policy guides CDFW on the quantity and quality of the waters of this State that should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife; to provide maximum protection and enhancement of fish and wildlife and their habitat; encourage and support programs to maintain or restore a high quality of the waters of this State; prevent the degradation thereof caused by pollution and contamination; and, endeavor to keep as much water as possible open and accessible to the public for the use and enjoyment of fish and wildlife. CDFW recommends avoidance of water practices and structures that use excessive

[9] https://wildlife.ca.gov/Licensing/Scientific-Collecting
[10] https://fgc.ca.gov/About/Policies/Miscellaneous

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amounts of water, and minimization of impacts that negatively affect water quality, to the extent feasible (Fish & G. Code, § 5650).

13) **Use of Native Plants and Trees**. CDFW recommends the City require the Project Applicant to provide a native plant palette for the Project. The Project's landscaping plan should be disclosed and evaluated in the DEIR for potential impacts on biological resources such as natural communities adjacent to the Project area (e.g., introducing non-native, invasive species). CDFW supports the use of native plants for the Project especially considering the Project's location adjacent to the Arroyo Seco. CDFW strongly recommends avoiding non-native, invasive species for landscaping and restoration, particularly any species listed as 'Moderate' or 'High' by the California Invasive Plant Council[11] CDFW supports the use of native species found in naturally occurring plant communities within or adjacent to the Project area. In addition, CDFW supports planting species of trees, such as oaks (Quercus genus), and understory vegetation (e.g., ground cover, subshrubs, and shrubs) that create habitat and provide a food source for birds. CDFW recommends retaining any standing, dead, or dying tree (snags) where possible because snags provide perching and nesting habitat for birds and raptors. Finally, CDFW supports planting species of vegetation with high insect and pollinator value.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNDDB website[12] provides direction regarding the types of information that should be reported and allows on-line submittal of field survey forms.

In addition, information on special status native plant populations and sensitive natural communities, should be submitted to CDFW's Vegetation Classification and Mapping Program using the Combined Rapid Assessment and Relevé Form[13].

The City should ensure data collected for the preparation of the DEIR is properly submitted.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be

[11] https://www.cal-ipc.org/plants/inventory/
[12] https://wildlife.ca.gov/Data/CNDDB
[13] https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities/Submit

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operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP to assist the City in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to Felicia Silva[14], Senior Environmental Scientist (Specialist).

Sincerely,

DocuSigned by:
Baron Barrera
57FC783AB67942E...

Baron Barrera, Senior Environmental Scientist (Supervisory)
Signing for Heather A. Pert
Environmental Program Manager
South Coast Region

ec: California Department of Fish and Wildlife
Heather A. Pert; EPM
Baron Barrera; Senior Environmental Scientist (Supervisory)
Cindy Hailey; Staff Services Analyst

Office of Planning and Research
State.Clearinghouse@opr.ca.gov

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[14] Phone: (5620 292-8105; Email: Felicia.Silva@wildlife.ca.gov

From: Monica Charles
Sent: Wednesday, June 25, 2025 11:29 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project

Dear Ms. Monde,

I respectfully submit these scoping comments for the Environmental Impact Report (EIR) for the proposed Arroyo Seco Water Reuse Project. Given the project's potential for significant environmental impacts, I request that the EIR provide comprehensive analysis of the following critical issues to ensure full compliance with CEQA.

Key Areas Requiring Thorough Environmental Analysis

1. Project Alternatives Analysis: The EIR must evaluate nature-based solutions (bioswales, infiltration basins, and the like), upstream pollution control measures, phased restoration approaches, and a comprehensive no-project alternative that could achieve water quality goals with reduced environmental impacts.

2. Biological Resources Impact Analysis: The EIR must include complete biological surveys documenting existing riparian ecosystem functions, wildlife usage patterns, and cumulative habitat loss analysis. Specific assessment of impacts of removing 142 trees (including 42 protected trees) out of a total of 195 counted trees for both sites, and realistic timelines for replacement habitat functionality are essential. (Draft MND, Table 3). Include alternative projects that maintain the existing native trees and shrubs.

3. Hydrology, Water Quality and Water Rights: The EIR must provide current water quality data, detailed TMDL compliance modeling, downstream flow impact assessment, and analysis of the legal authority to divert 535 acre-feet of water, with 62 acre-feet guaranteed to the City of South Pasadena to irrigate its golf course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Climate change resilience analysis is also required.

4. Long-term Operations and Maintenance: Given the complexity of proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity, life-cycle costs, and performance monitoring protocols. 5. Construction Impacts: The estimated 17-month construction period requires detailed analysis of air quality, noise, traffic, and recreational impacts affecting multiple jurisdictions and park users. Consider projects that will accomplish the water quality goals with less construction-generated pollution. 6. Regional Coordination and Cumulative Impacts: Include projects that fit with 20+ years of Arroyo restoration plans and other watershed projects. The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. 7. Tribal Consultation: Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage

Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation. Essential Requirements The EIR must establish comprehensive baseline conditions through current biological surveys, recent water quality data, and existing recreational usage patterns. All significant impacts require specific, enforceable mitigation measures with performance standards and long-term funding mechanisms. This project will eliminate an entire functioning riparian ecosystem and requires thorough environmental analysis to ensure decision-makers and the public have complete information about environmental consequences and alternatives that could meet project objectives with reduced impacts. Thank you for considering these comments in the EIR scope of work.

Contact Information
Monica Charles

From: Chichester, Teddi
Sent: Sunday, June 29, 2025 6:59 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: San Pascual Park

Dear Mr./Ms. Monde:

I am writing to urge you to modify your master plan for new design features at San Pascual Park. As someone who enjoys riding her horse along the trails in the Arroyo, I'm concerned that not only is the design excluding and perhaps endangering equestrians, but also degrading the experience of many of the hikers with whom we share these trails.

I am most alarmed, however, about the intent to remove trees and other native plants. In an era of climate crisis and unprecedented species extinction, it's actually criminal to destroy the very vegetation that acts as carbon sinks and habitat for native wildlife. And we all need the shade, beauty, and vitality that plants and especially trees provide.

Please keep these concerns in mind as you adopt what I hope will be a smarter, more eco- (and horse- and hiker-) friendly design.

Thank you,
Teddi

Teddi Lynn Chichester, Ph.D.
Senior Continuing Lecturer
UCLA Writing Programs
105 Kaplan Hall

From: Sue Choi
Sent: Sunday, June 15, 2025 1:29 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Save San Pascuel Park

Hi Christina,

As a resident and property owner in this area, I strongly disagree with taking away a park that all the residents enjoy, escape to in the heat, and celebrate joyous occasions in. All this to water a golf course? What an outrageous suggestion to cut down these beautiful historic trees in a time of environmental disaster and political unrest. You're proposing to taking away a park from a working class neighborhood to fund a golf course in a completely different neighborhood? How shameful and unnecessary. I believe Pasadena can think of other solutions without taking land that is connected to a native indigenous area.

Sincerely,
Sue Choi

From: John Collinson
Sent: Monday, May 26, 2025 11:18 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Cc: Elise Ludwig
Subject: Support for Pasadena/South Pasadena Arroyo Water Reclamation Project

Dear Christina,

I am a resident of Highland Park (Poppy Peak) and a frequent user of the Lower Arroyo trail. I strongly support the Arroyo Water Reclamation project that will remediate toxic flows down the Arroyo Seco culvert to the LA River and reclaim water to support the aquifer and reduce use of potable water for watering the golf course.

Thank you for your hard work on this project that benefits so many people and wildlife.

Sincerely,

John Collinson

From: Steve Crouch
Sent: Monday, June 30, 2025 4:26 PM
To: Monde, Christina <cmonde@cityofpasadena.net>; Maue, Brent <bmaue@cityofpasadena.net>
Cc: Steve Crouch
Subject: Arroyo Seco Water Reuse Project EIR Scoping

The EIR for this project must take into account the following aspects...

First of all, it seems like an obvious conflict of interest that the lead contractor of the project should do the EIR as well. They have every incentive to skew the findings to their benefit.

This project as planned will take away the only remaining wetland wildlife refuge for many miles around. Johnston Lake may be a wetland but it is certainly not a refuge as there are almost no secure and secluded areas for wildlife around its shore. The area behind Devil's Gate Dam is currently dry and is no longer a wetland.

In a time of global warming it makes no sense to remove mature trees which provide substantial shade and replace them with fewer trees which will take many years to reach maturity.

I would personally be impacted by the elimination of the mature tree forest and subjected to sharply increased light and noise intrusion.

San Pascual Park has had vastly fewer gophers since the Blue Herons have taken up residence in the proposed project area. This is important since the City of Los Angeles does not have money for gopher control.

It would essentially be the destruction of a unique wildlife habitat to construct a reservoir for a golf course.

It does not make sense in these times of water shortages and drought to have a driving range which requires 20% of the water for the entire golf course and where no one walks. Alternative surfaces need to be found for the driving range.

I am not anti-golf, I used to go there frequently until an injury forced me off the links several years ago.

Directly across the Arroyo Seco channel from the golf course is an undeveloped tract of approximately 5 acres whose only use for the past several years has been as a homeless encampment. This site, known as Bridewell Island, should be studied as an alternative location for the water reuse project

This is wildlifes' last stand, we have taken everything from them, this small area is all they have left. Can't we leave anything for them?

Thank You,
Steve Crouch

Friends of
SOUTH PASADENA
NATURE PARK

June 29, 2025

Christina Monde, P.E.
City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101

Re: Scoping Comments for Arroyo Seco Water Reuse Project EIR

Dear Ms. Monde,

Friends of South Pasadena Nature Park has been working for the past 20 years to restore four acres of parkland along the Arroyo Seco. Our organization has contributed thousands of hours of volunteer time, including over 3,000 person-hours in the past two years alone. We have collaborated extensively with more than 40 partners, including South Pasadena city departments, local Scout groups, Bank of America's My Environment program, the Pasadena Audubon Society and numerous other community organizations. For the past three years, we partnered with the City of South Pasadena and South Pasadena Beautiful to organize annual Sustainability Fairs that reached approximately 300 community members each year.

Through our extensive restoration work in the Arroyo Seco Woodland and Wildlife Park, we have gained valuable insights that directly relate to the environmental challenges facing the proposed Arroyo Seco Water Reuse Project sites. Our experience has demonstrated two critical lessons: first, that any site disturbance creates conditions favoring non-native invasive species, making subsequent restoration efforts exponentially more difficult; and second, that successful ecological restoration requires sustained, long-term commitment and continuous management by individuals with specialized restoration expertise.

Given our organization's deep experience with Arroyo Seco ecosystem restoration and the project's location within this sensitive watershed, I respectfully submit these scoping comments for the Environmental Impact Report (EIR) for the proposed Arroyo Seco Water Reuse Project. While we recognize the project's potential water supply benefits, we are concerned about significant environmental impacts, particularly those affecting habitat

restoration and the broader goal of Arroyo Seco Watershed restoration. Therefore, I request that the EIR provide comprehensive analysis of the following critical issues to ensure full compliance with CEQA requirements.

Key Areas Requiring Thorough Environmental Analysis

Project Alternatives Analysis The EIR must evaluate nature-based solutions, including bioswales, infiltration basins, and similar green infrastructure approaches. The analysis should examine upstream pollution control measures, phased restoration approaches, and a comprehensive no-project alternative that could achieve water quality goals with reduced environmental impacts. Projects that minimize site disturbance should be prioritized, as they offer the best opportunity for successful habitat restoration.

1. **Biological Resources Impact Analysis** The EIR must include comprehensive biological surveys documenting existing riparian ecosystem functions, wildlife usage patterns, and cumulative habitat loss analysis. Critical assessment is required for the impacts of removing 142 trees (including 42 protected trees) out of a total of 195 counted trees across both sites, with realistic timelines for replacement habitat functionality. The analysis must include alternative projects that preserve existing native trees and shrubs and minimizing soil disturbance.

2. **Arroyo Seco Stream Restoration Compatibility** The EIR must evaluate projects that align with over 20 years of established Arroyo restoration plans and other watershed initiatives. This includes the Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024, which will identify essential improvements to the channel, maximize ecosystem restoration, and ensure flood protection for surrounding communities. The proposed addition of pipes, pumps, artificial filters, and lined wetlands contradicts these long-standing and ongoing plans to restore natural hydrologic function and improve habitat along the Arroyo Seco. The analysis should include an alternative that removes the concrete lining in San Rafael Creek just above its confluence with the Arroyo Seco, allowing natural stream flow to create wetland habitat and establish a natural connection to the Arroyo Seco.

3. **Consultant Expertise in Nature-based Solutions** Rather than continuing with engineering-oriented consultants, the project should engage consultants experienced in nature-based stream restoration and water quality mitigation. This approach would align

with Safe Clean Water program goals and modern stream management practices appropriate for the climate change era.

4. **Hydrology, Water Quality and Water Rights** The EIR must provide current water quality data, detailed TMDL compliance modeling, downstream flow impact assessment, and comprehensive analysis of legal authority to divert water, including the 62 acre-feet guaranteed to the City of South Pasadena for golf course irrigation as stated in the Community Outreach Meeting on April 27, 2023. The analysis should present alternatives that improve water quality by addressing pollution at its source, including mitigation for polluted runoff from San Pascual Stables and the Arroyo Seco Golf Course. Climate change resilience analysis is also required.

5. **Restoration Plans and Long-term Stewardship** The EIR must detail specific plans and identify dedicated resources for the ongoing work required for successful habitat restoration. This includes specifying how the cities of South Pasadena and Pasadena will fund qualified staff or experienced contractors to restore and maintain native plant habitat in perpetuity. Project proposals requiring significant site disturbance—including vegetation removal, land grading, and installation of grey infrastructure—must demonstrate commitment of the substantial resources necessary to restore and maintain healthy habitat conditions.

6. **Long-term Operations and Maintenance** Given the complexity of proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity for ongoing management, life-cycle costs, and performance monitoring protocols. The analysis must demonstrate that the cities have committed and will maintain the resources necessary for infrastructure maintenance. This must include regular removal of accumulated silt and debris from artificial pools, ponds, or basins, if such structures are built.

7. **Construction Impacts** The estimated 17-month construction period noted in the MND requires detailed analysis of air quality, noise, traffic, and recreational impacts affecting multiple jurisdictions and park users. The EIR should prioritize alternatives that accomplish water quality goals while minimizing construction-generated pollution and community disruption.

8. **Tribal Consultation** Consistent with AB 52 requirements, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation, who were identified by the Native American Heritage Commission as having sacred land within the project vicinity. This consultation must acknowledge the Gabrieleno Kizh Nation as experts on land use, biological resources, historical resources, and cultural resources, with protection measures prescribed by the Tribal Nation.

9. **Community Engagement** The EIR should establish a comprehensive community engagement program involving stakeholder groups including Friends of South Pasadena Nature Park, Stewards of the Arroyo Seco, the Council of Arroyo Seco Organizations, Save San Pascual Park, and local agencies including the City of Los Angeles. Meaningful participation throughout the planning process is essential—simply announcing results when the draft EIR is issued is insufficient.

Essential Requirements

The EIR must establish comprehensive baseline conditions through current biological surveys, recent water quality data, and existing recreational usage patterns. All significant impacts require specific, enforceable mitigation measures with performance standards and long-term funding mechanisms.

This project as proposed in the MND will eliminate an entire functioning riparian ecosystem and requires thorough environmental analysis to ensure decision-makers and the public have complete information about environmental consequences. Alternatives that preserve this valuable riparian ecosystem while meeting project objectives should be given serious consideration and detailed analysis in the EIR.

Thank you for considering these comments in the EIR scope of work.

Yours,



Barbara Eisenstein
Founder and Head
Friends of South Pasadena Nature Park

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Mark Estrada Email Address: _

Address: _

Signature: [signature] Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

June 30, 2025

Christina Monde
Project Manager
Arroyo Seco Water Reuse Project
100 N. Garfield Ave., Suite N306
Pasadena, CA 91101

CMonde@cityofpasadena.net

Dear Ms. Monde:

We have touched base at several community meetings regarding equestrian concerns being addressed with the Arroyo Seco Water Reuse Project. You have been most supportive, and I'd like to reaffirm some of your previous statements from our prior conversations.

Some individuals have recently interpreted the Master Plan in the following manner

1) No replacement of equestrian fencing along the trails. **Please confirm that the equestrian fencing will be replaced along the roadway.**
2) There are shared walkways and benches along the equestrian trail**. Please confirm that the benches will be set apart from the equestrian trails.**

If the above statements are not correct, please reconfigure the Master plan to separate equestrian and pedestrian trail to allow for safe passage of all trail stakeholders, be they two footed or four footed.

Thanking you in advance for all your hard work and dedicated consideration,

Dianne Domingo-Foraste M.D.
Aka Dianne Lockhart
Equestrian Trails Inc. Corral 2 Board Member

June 30, 2025

Christina Monde, P.E.
City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

To: Christina Monde
Re: Arroyo Seco Water Reuse Project Environmental Impact Scoping Document
From: Mark Forbes

This letter is in response for public input on the Environmental Impact Report being prepared for the Arroyo Seco Water Reuse Project.

As the Environmental Impact Report (EIR) is required to include alternatives to the currently planned project, the following should be considered:

Water Filtration and Cleaning

1. **Detail a project alternative that does not include sending any water to the South Pasadena Golf Course.** As the South Pasadena Golf Course is planning a $25 Million dollar retrofit, their plans should include water capture that does not include taking water from the Arroyo Seco. There are a number of other golf courses throughout the western United States that include native landscaping and water retention alternatives that take no water from local tributaries.

2. **The EIR must detail the potential of re-contamination due to the outfall from the South Pasadena Golf Course.** The project proposes to filter the water at the San Pascual site and divert it to the South Pasadena Golf Course before being returned to the Arroyo, which potentially re-pollutes the "clean water" with chemicals, fertilizers, and soil contaminants that exist at the golf course, negating the efforts in "cleaning the water".

Pollutants and Contaminant Elimination at the Source.
It has been well documented by local residents that overflow from the horse stables during heavy rainstorms produce an inordinate amount of runoff matter in the Arroyo, which clearly contain urine and fecal material.

The EIR must detail an alternative that **eliminates contaminants at the source.**
This alternative needs to:

- **Determine where the source contamination is coming from** including testing for coliform bacteria during and after heavy rains above and below the multiple horse stables along the Arroyo Seco in Pasadena and

South Pasadena (especially along the San Rafael and San Pascual project sites).

- **Include a plan for its pollution mitigation**, the expected reduction in pollutant load from this mitigation, and the necessity of Arroyo Seco Water Reuse project once the pollutant and contaminant reduction and mitigation program is in place.
- **Implement further mitigation** if above mitigation plan does not significantly reduce the contaminant load sufficiently. Additionally, it should be noted where these additional contaminants are originating from and in those areas as well, how are they being mitigated - prior to the project being implemented.

No Build Alternative

It must be considered in the EIR:

- **If pollutants in the Arroyo Seco have decreased significantly enough as stated about in such mitigation, such that "Clean, Safe" water has been established based on Los Angeles and CA State requirements.**
- **If mitigation is successful, it must be reassessed if a project the size of the Arroyo Seco Water Reuse Project is necessary** by using less costly alternatives – such as a working and ongoing contamination mitigation program and despite the needs of South Pasadena's request to use water from the Arroyo Seco for the South Pasadena Golf Course.

Ground infiltration

Depending on the public documents that have been presented, it's difficult to tell if any water will actually be infiltrating the local aquifers, and if any water that is infiltrated into the ground will be taken out at a later time. This must be clearly and specifically outlined and detailed clearly in the Environmental Impact Report:

- **How will the fresh water Garfias Spring be diverted in this project?**
- **If and how much water is expected to infiltrate the local aquifers?**
- **If any water in infiltrated into the ground, will this water be taken out by either Pasadena or South Pasadena and if so, how much annually?**
- **If water is be removed by wither Pasadena or South Pasadena from these aquifers, do these cities have California Water Rights to do so?**
- **How much water will be collected at both the San Rafael and San Pascual sites annually?**
- **How it will be determined that the stated water collection numbers will be the maximum at any time?**
- **How will water be taken from the Arroyo Seco at different times of the year?**
- **If the same amounts of water will be taken during heavy rainfall years as well as during drought years?**

How will the volume of water being taken from the Arroyo Seco be reported to the public annually?

- **State the volume of water that is expected to evaporate annually as a result of creating large pools of water with a large surface areas and waterfalls at each site.**

Water to the Golf Course

It must be clear in the EIR:

- **How much water will be diverted to the South Pasadena Golf Course from the Arroyo Seco at the San Pascual project site**,
- **How much water will be diverted to the South Pasadena Golf Course from the proposed "Water Harvester",** which is planned to be built and implemented further down the Arroyo Seco next to the South Pasadena Golf Course.
- **The proposed "Water Harvester" must be well documented in the proposed plans and its impact of potential natural restoration to the Arroyo Seco.**
- **Describe and detail how this Water Harvester at the South Pasadena Golf Course complies with the requirements of the California Clean Safe Water Act, and the intended use of Measure W funds of a "nature-based solution" to clean water.**
- **Detail why the "water harvester", which will be used for the South Pasadena Golf Course should be included in this project to clean the Arroyo Seco tributary.**

Water Rights

It has been stated in a number of instance, both in the Mitigation Negative Declaration, as well as in public comments by representatives from Pasadena, that South Pasadena has diversionary water rights from the Arroyo Seco to the South Pasadena Golf Course because (in summary) "we have been doing this for years." Additionally, Pasadena has said publically that they have these rights and have been pulling water from the Arroyo Seco to the South Pasadena Golf Course but have stopped doing this because, "the water was too polluted". Based on California law, if a jurisdiction has been granted water rights but has stopped using them, the rights become forfeit.

In California, a diversionary water right from any body of water is required to have a water rights granted to a city only by the California State Water Board. These rights are publically available for review.

The EIR must include:

- **Public documentation from the State of California of South Pasadena's current, valid, and publically available documentation of Water Rights to divert water from the Arroyo Seco for recreational use.**

From:
Sent: Saturday, June 28, 2025 12:52 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: EIR Arroyo Seco Water Reuse Project

About a year ago, I was alarmed to read about the proposed destruction of the Lower Arroyo Seco in order to provide water for a South Pasadena golf course. Residents from affected neighborhoods in the City of Los Angeles challenged this ill-conceived plan and forced the cities of Pasadena and South Pasadena to prepare an Environmental Impact Report which is now in its early stages.
At this time, the City of Pasadena has an opportunity to rethink and revise their misguided "Arroyo Seco Water Reuse Project" which ignored the official Lower Arroyo Master Plan approved in 2003. The so-called Water Reuse project would degrade the Lower Arroyo with industrial equipment and deprive the three adjoining cities of precious green space and recreational facilities, all for private benefit of a golf course that is not even located in the City of Pasadena. (It is bad enough that Brookside Golf Course is irrigated with potable water.)

The three cities (Pasadena, South Pasadena and Los Angeles) and Los Angeles County must work together collaboratively to restore the Arroyo Seco. Rainfall and the natural flow of the creek and the canyon will create real wetlands and habitat. Replace the current exploitive plan with a nature-based watershed that encompasses the Arroyo Restoration Corridor (ARC) extending from San Rafael Bridge in Pasadena through South Pasadena to York Boulevard Bridge in Los Angeles.

The nature-based approach will eliminate pollution naturally and be far less costly than the $14 million plan to degrade the lower arroyo with pipes, plumbing and artificial pools. It will also significantly reduce the need for ongoing maintenance of artificial habitat and industrial equipment and be much more meaningful for pedestrians who love the area's natural treasures.

Restoring the natural character of the Arroyo Seco, as much as possible, has great urgency in the era of climate change. Today, it is necessary to deal with two great environmental challenges of our time: 1) developing a resilient water program and 2) promoting biodiversity.

The City of Pasadena should withdraw from the discredited "Arroyo Seco Water Reuse Project" and collaborate on a nature-based plan that will benefit our community, our watershed, our air-quality, and the existing riparian corridor.

Genette Foster

Council District 2

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.
(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(✓) An alternative that seeks input from community members and takes this information into consideration.
(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Grisel Villalobos Email Address: _

Address:

Signature: _____ Date: 10-14-2024

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
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(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(✓) Additional comments:
The meeting assumes the project is beneficial. I don't agree

Name: John Gallagher Email Address

Address:

Signature: John Gallagher Date: 5/28/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

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( ) Additional comments:

Name: John Galloway Email Address:

Address:

Signature: Date: 323-251-7030

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: [illegible] Email Addres[illegible]

Address:

Signature: [illegible] Date: 8/14/24

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

Christina Monde,

These comments pertain to the San Pascual (South Pasadena / Los Angeles) side of the project.

This project seeks to replace a unique old growth oak/sycamore/palm/toyon/sumac/ willow/elderberry riparian forest with an infiltration basin for polluted water when the state requirement has nothing to do with infiltration.

Truly historic aesthetic beauty lies behind a wall of invasives and deadwood. Fire-friendly natives are resprouting and regrowing all throughout the burn area.

It should be acknowledged that this site currently contains a thicket of cattails and I was told that cattails are the only part of the proposed system that will reduce the bacteria levels. This site *already* contains a thriving bioremediation system serving to reduce the Arroyo's TMDLs.

Trees & Plants

Tree 335 is a perfect specimen oak with perfect spacing and visual prominence and the plans call for it to be used for heavy machinery staging.

Heavy machinery will seriously impact the root systems of all protected trees in the vicinity.

Tree 326 – tree survey says remove – visual plans say otherwise.

There is no tree replacement plan. Where is the tree protection diagram as it pertains to the grading for the infiltration basin?

Cutouts for the infiltration basin remove massive amounts of native foliage across the entire site, disturb the geology and hydrology of the trees that remain and ultimately leave a boring pond in the winter and a barren gravel pit in the summer.

There is no landscape/planting plan. The entirety of our obligation to the state is to bioremediate and I was told by a representative at the EIR meeting in the South Pasadena community room that this is done exclusively by the cattails. There's no acknowledgement of the existing cattails nor an analysis of how many will be replanted and where.

Palms & Bats

The sweeping majority of the palms listed as Mexican Fan Palms (Washingtonia Robusta) are actually California Fan Palms (Washingtonia Filifera). The California Fan Palm is a native species. They keep their skirts, as is on display. Native bats live in their skirts. I witnessed bats flying over the channel. This is perfect bat habitat–palm skirts above a stream. I witnessed few to no night insects, definitely no mosquitos at the site at any point during the day, during dusk or into the late evening. Compare to me experiencing heavy mosquitos in my residential area one mile away at the same time of year (June).

Thanks to the native palms there are native bats and they are controlling the mosquito population and humans are sweating well into the evening immediately across the street seven days a week. Mosquitos carry deadly vectors. The current utility of those palms cannot be overstated.

Shrubs & Adolescent Trees

Not all native shrubs are listed. Any native shrub over 14' in height and with a single trunk greater than 4" DBH is protected according to SPMC Chapter 34. There are massive Laurel Sumacs that cover expansive square footage being completely left off any and all plans.

There are also hollyleaf cherry plants and other adolescent oaks and other natives trickled throughout the diverse ecosystem. There are many young palms to replace the few lost in the fire. Young california palms should be encouraged.

Fire

Fire damage should be accounted for, conservatively. Fire damaged natives should be protected wherever possible.

Water

The site's geology isn't conducive to infiltration as per the soils report. Existing alluvial soils are native soils and ideal for native trees. I've seen at least one geology overlay that showed the entire remainder of the South Pasadena arroyo basin being a good candidate for infiltration. The infiltration should be done literally anywhere else. The best place for it to go is at the end of a long series of remediation sites before infiltrating as clean as possible at the treeless driving range. As it stands right now the infiltration basin doesn't appear to benefit from the jellyfish filter.

Dirty water shouldn't be used for irrigation or infiltration.

How does dry weather flow get to a golf course sprinkler head? It also doesn't appear to touch the jellyfish.

What is the flow of the current system? What is the flow of the proposed system? Include:

- "tile tunnel"
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- overflow plumbing to the nature park as this project site is a non-trivial component of the overall interconnected system spanning the minimal extent of South Pasadena's channel adjacency
- water pipe on the East side of the site just on the South Pasadena side of the city

boundary (where does it originate? possibly the grate across the baseball field? where does that originate? natural stream or dry weather runoff?)

- series of weep holes on channel side?

Then and only then can you gauge the net TMDL reduction this project will account for.

Is the input clogged? What is the aperture of the exit at the damn to the tile tunnel? How can plumbing be repaired or manipulated in place to restore damn spillover to facilitate the riddance of swampy anaroebic decomposition?

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Describe the different states – dry and wet weather – with diagrams showing water elevations, water management practices at play and protected and proposed replacement trees and plants.

Animals

Animals are present, thriving and reproducing. Besides bats and their important role, I've personally witnessed a Black-crowned Night Heron hunting in the stream, a family of Red-Eared Sliders (turtles) living in the primary outlet, a catfish-esque fish at least a foot in length, a 6" crawfish, fence lizards galore, cottontail rabbits, a coyote, a family of mallards, dragonflies, oak galls (implying wasps), ravens, hawks, kestrels, owls, parrots of all varieties. There is a notably consistent as is diverse selection of parrot species. Many more miscellaneous bird species thriving off the berries of the shrubs in the vast understory set to be removed in its entirety. Birds love poison oak berries.

It looks like there was or possibly still is a large nest in the burnt brazilian pepper tree adjacent to the sycamore near the center of the site. The Heron is a protected species.

Unnatural

The 12' access road is entirely unnecessary and unnatural. It perfectly exemplifies the lack of attention to environmental impact. The straight exterior channel-side path is entirely unnatural and non-immersive, windy, exposed, never to be used by anyone, ever.

My estimate is that the site's ecosystem would be a **total loss** given the current plans

with the final replacement plantings being as poorly designed as the project has been designed thus far.

This site needs to be given the respect that it deserves, cleaned up as it is, tested and put back to work with as minimal an impact as is possible for all living things involved. Tacking on infiltration to fulfill grant criteria is wrong–scope creep at its worst. Manually bucket out polluted soil in sections, fix the flow, plant more cattails and more tightly integrate with the remaining plans for water treatment in the South Pasadena arroyo basin.

Thank you,
Angelo Gladding
South Pasadena resident

From: Angelo Gladding
Sent: Monday, June 30, 2025 4:53 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project EIR Comment

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(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments: Put an infiltration pond under driving range & use to fight fires

Name: Angelo Gladding Email Address:

Address:

Signature: Angel Gladdy Date: 5/29/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Monica Gonzalez
Sent: Sunday, June 29, 2025 9:04 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Comments for Arroyo secco water project

Good evening Christina,

I am a horse boarder at arroyo secco and was given this email for comments on this matter.

I was not completely given information on the comment or email to write to you.
So I only hope below is enough.

I am writing to express my concern regarding the current plans for city Water Reuse Project, which seems to include the removal of our community's horse trails by some of the photos that were shown.

While I understand and support the need for progress and infrastructure improvements, I strongly believe that eliminating these trails undermines a vital part of our local heritage and lifestyle. The horse trails provide not only recreational and therapeutic value but also a unique connection to our area's rural roots—something increasingly rare and deeply valued by many residents.

I urge the city to reconsider this aspect of the plan and explore options that allow for growth while preserving these important spaces. Development should not come at the cost of erasing what makes our community special.

Thank you for your time and consideration.

V/R,
Monica Gonzalez

From: Barbara Guerra-Torres
Sent: Monday, June 30, 2025 12:53 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project, Comment Letter

Dear Ms. Monde,

I'm writing about the environmental study for the proposed Arroyo Seco Water Reuse Project. This project could seriously harm the local environment, so the study needs to look closely at the following important issues:

Better Alternatives Study
natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site to allow for less destructive ways to stop pollution upstream. Also, look at doing nothing and still meeting clean water goals by stopping pollution at the source.

Wildlife and Trees
This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually work. We would like to see alternatives that maintain the existing native trees and shrubs.

Water Rights and Quality
Show current water pollution levels, prove the cleanup will work, study how taking 535 acre-feet of water affects downstream areas, and confirm the cities have legal rights to take this water. Show that the City of South Pasadena has the legal water rights to take 62 acre-feet of Arroyo Seco water for irrigation of the Arroyo Seco Golf Course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Also study how climate change affects everything.

Long-term Costs and Care
This is complex infrastructure. Study who will maintain it, how much it will cost over time, and how we'll know if it's working.

Construction Problems
The estimated 17 months of construction, as noted in the MND, will create air pollution, noise, and disrupt park users. Look for projects that will accomplish the water quality goals with less construction-generated pollution.

Regional Planning
The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. Include projects that fit with over 20 years of Arroyo restoration plans and other watershed projects, as well as the recent Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024.

Why This Matters
This project will destroy a natural stream ecosystem that, while impacted by weeds, still provides important habitat right now. The environmental study must show exactly what exists today and require specific, enforceable fixes with clear standards and guaranteed long-term funding.

The public and decision-makers need complete, honest information about what this project will destroy and whether there are better ways to clean the water that don't cause so much environmental damage.

Thank you for considering these comments in the EIR scope of work.

Barbara Guerra-Torres

From: Bob Gutzman
Sent: Saturday, June 28, 2025 2:07 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Cc: marcie chan
Subject: Keep The Arroyo Seco Natural

Dear Christina,

Please include these comments in the official scoping comments for the Environmental Impact Report (EIR) related to the controversial Arroyo Seco Water Reuse Project. Also please forward them to any folks who are involved in this process. Thanks very much.

My wife, Marcie Chan (cc'd here) and I love the natural Arroyo. We walk or run in it multiple times a week, and have done so for decades. It is always inspiring to see Mother Nature at her best.

We are so pleased that, over the years, the City has taken positive steps to put in native plants, remove non-natives, and to study ways to potentially remove the concrete flood control channel.

It is our understanding that the controversial Arroyo Seco Water Reuse Project requires an EIR. Please be sure to correct the deficiencies of the now-revoked plan, and to recraft one that will promote biodiversity, nature-based solutions and community engagement.

The three cities and the County need to work together collaboratively to restore the Arroyo Seco. Let the rainfall and the natural flow of the San Rafael Creek and the canyon create real wetlands and habitat. Develop a nature-based watershed alternative that encompasses the Arroyo Restoration Corridor (ARC) extending from San Rafael Bridge in Pasadena through South Pasadena to York Boulevard Bridge in Los Angeles.

The nature-based approach will eliminate pollution naturally and be far less costly. It will also significantly reduce the need for ongoing maintenance of artificial habitat and industrial equipment and be much more enjoyable for pedestrians who love the area's natural treasures.

Restoring the natural character of the Arroyo Seco, as much as possible, has far greater urgency in the era of climate change. In the past it was visionary. Today, it is necessary to deal with two great environmental challenges of our time: (1) developing a resilient water program, and (2) promoting biodiversity.

We can work with Mother Nature or against her, but Mother Nature always wins so let's work with her!

Thanks for reading this and for correcting the deficiencies of the now-revoked plan.

Sincerely,

Bob Gutzman and Marcie Chan

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(✓) An alternative that seeks input from community members and takes this information into consideration.
(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(✓) Additional comments:

Lack of green spaces in percentile comparison to population & mental health

Name: Robyn Haley Email Address:

Address:

Signature: Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

(✓) The loss of a local cherished community parkland including the loss of access to the water.

(✓) Removal of a water source that is currently supporting local wildlife.

(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.

(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

(✓) An alternative that seeks input from community members and takes this information into consideration.

(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

(✓) Additional comments:

Assess the annual expenditures for maintenance of the park area

Name: Jeffrey Hernandez Email Address: ____

Address:

Signature: _____ Date: 6/22/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: Robi Inserra
Sent: Wednesday, May 28, 2025 7:16 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: I support you

Hello Christina
I fully support your project of filtration and reclamation.
Robi Inserra
Sent from my iPhone

June 29, 2025

Christina Monde, P.E.
City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

Re: Arroyo Seco Water Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

I am writing to both express my opposition to the proposed *Arroyo Seco Water Reuse Project* and to comment on aspects of the proposed project that should be addressed in the required Environmental Impact Report (EIR).

That a project of this magnitude can reach the point of having already created detailed plans and obtained the necessary funding to go forward without any prior environmental review is quite disheartening. It is hard to avoid the conclusion that the promoters of the project were purposely trying to avoid close public scrutiny.

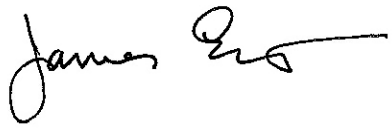
Among the points the EIR must address are:

1. **What alternative plans have been considered**? Are there ways to achieve the intended goals without the very negative environmental impact the proposed heavy construction will certainly have?
2. The plan calls for the effective **destruction of an existing natural habitat** (including wetland and dozens of protected trees). Is this really necessary? The plan claims that a new "natural" habitat will be established as part of the project. What exactly does this mean? Such claims are often made by developers. The results are generally very disappointing.
3. Big projects like this one imply the need for long term maintenance. In contrast to the initial enthusiasm for construction, long term maintenance is often ignored. A detailed and **obligatory commitment for maintenance** needs to be clearly spelled out by the cities of Pasadena and South Pasadena.
4. South Pasadena hopes to divert water from the Arroyo Seco in order to water its nearby golf course. **Do they have the legal rights to this water**? Does the desire for green golfing fairways outweigh the destruction of one of the very few remaining natural habitats in our area?
5. We are all aware of **climate change**. How will climate change affect the function of the proposed project?

6. Finally, the concrete channelization of the Arroyo Seco for flood control was done many decades ago. It (and its many siblings throughout the LA basin) remains a terrible blot on our landscape. **Alternative plans for the Arroyo Seco, which preserve the flood control function but vastly reduce its negative environmental impact, have been made and ignored for many years.** These plans should be revisited. To simply bull ahead with an unreviewed, deeply invasive construction project would risk repeating the same mistakes made in the past.

Thank you for considering these comments.

Sincerely,



James P. Eisenstein

29-year resident of South Pasadena

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(M) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

(K) The loss of a local cherished community parkland including the loss of access to the water.

(J) Removal of a water source that is currently supporting local wildlife.

(O) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

(Y) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

(T) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

(J) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

(I) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

(P) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

(R) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

(D) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

(C) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

(A) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

(E) Exploration of alternative areas that do not require the destruction of the current ecosystem.

(H) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

(F) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

(B) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

(L) An alternative that seeks input from community members and takes this information into consideration.

(G) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

(N) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: John Smith Email Address:

Address:

Signature: 6/14/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: Jens Jonason
Sent: Sunday, May 25, 2025 2:35 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Incoming from "Save San Pascual"

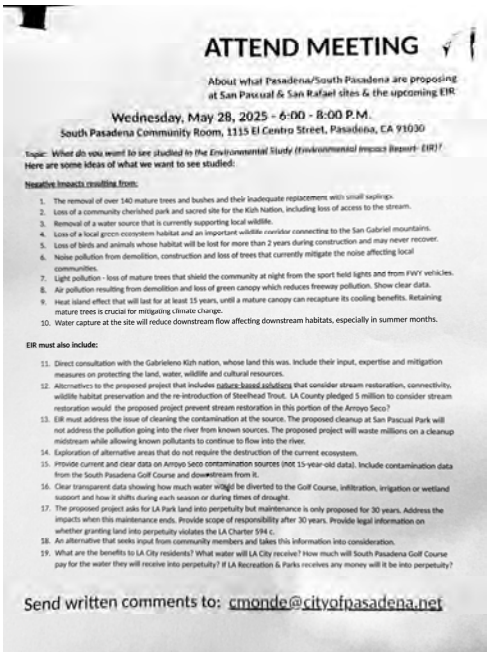
Hi Christina,

I'm a friend of Pilar Reynaldo's.

Like her, I'm very much in support of the Arroyo Seco Water Reuse Project, and quite concerned about the baseless, reckless opposition and their use of disinformation to achieve their goals.

The reason I'm emailing you today is threefold:

1. This comment template is posted at the ASWRP San Pascual site. It was added after yesterday's cleanup. I'm sure it's been circulated digitally as well.



ATTEND MEETING

About what Pasadena/South Pasadena are proposing at San Pascual & San Rafael sites & the upcoming EIR

Wednesday, May 28, 2025 - 6:00 - 8:00 P.M.
South Pasadena Community Room, 1115 El Centro Street, Pasadena, CA 91030

Topic: What do you want to see studied in the Environmental Study (Environmental Impact Report- EIR)?
Here are some ideas of what we want to see studied:

Negative Impacts resulting from:

1. The removal of over 140 mature trees and bushes and their inadequate replacement with small saplings.
2. Loss of a community cherished park and sacred site for the Kizh Nation, including loss of access to the stream.
3. Removal of a water source that is currently supporting local wildlife.
4. Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
5. Loss of birds and animals whose habitat will be lost for more than 2 years during construction and may never recover.
6. Noise pollution from demolition, construction and loss of trees that currently mitigate the noise affecting local communities.
7. Light pollution - loss of mature trees that shield the community at night from the sport field lights and from FWY vehicles.
8. Air pollution resulting from demolition and loss of green canopy which reduces freeway pollution. Show clear data.
9. Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
10. Water capture at the site will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

11. Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
12. Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout. LA County pledged 5 million to consider stream restoration would the proposed project prevent stream restoration in this portion of the Arroyo Seco?
13. EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river.
14. Exploration of alternative areas that do not require the destruction of the current ecosystem.
15. Provide current and clear data on Arroyo Seco contamination sources (NOT 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
16. Clear transparent data showing how much water would be diverted to the Golf Course, infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
17. The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
18. An alternative that seeks input from community members and takes this information into consideration.
19. What are the benefits to LA City residents? What water will LA City receive? How much will South Pasadena Golf Course pay for the water they will receive into perpetuity? If LA Recreation & Parks receives any money will it be into perpetuity?

Send written comments to: cmonde@cityofpasadena.net

2. The clean-up definitely entered into City of South Pasadena side of the site, because trash at the encampment site that was present one hour prior to the clean-up is now gone.

I documented existing trash on the South Pasadena side one hour prior to clean-up start (7AM 5/24/2025).

Notably, so did Save San Pascual affiliate Save the LA River (https://www.instagram.com/savethelariver), aka Alejandro Palamino, in a public Instagram reel (https://www.instagram.com/reel/DKCucGtxVOw/)

Side note: The commentary by Mr Palamino is enlightening as to the motivations and fundamental perspectives of this group of individuals. Mr Palamino is a frequent and vocal critic of efforts to rehabilitate the Los Angeles River and adjacent land through the above account and his other Instagram account https://www.instagram.com/savethevireo. I'm sure that the State of CA's fish and wildlife

I confirmed at 1:50 PM today (5/25/2025) that the trash has been removed. While I appreciate their service of removing the trash, it is concerning that they used City of Los Angeles resources to do so.

3. The following Instagram posts by clean-up attendee Sam Brown Vasquez (https://www.instagram.com/brown4bassett) give additional insight into the "thinking" and perspectives of the opposition, and gives a preview of arguments they are likely to bring to meetings and public comments directly and indirectly by instructing others to repeat the talking points.

It is — in my opinion — a confused mishmash of grievances with no meaningful connection or relevance to ASWRP. But one thing is clear, this kind of rhetoric obviously resonates and animates a significant group of people enough to cause problems for worthwhile projects.

https://www.instagram.com/p/DKDGzC5hHU/



Sam Brown Vazquez - #SomosBassett on Instagram: "Short statement I provided earlier today at the Save San Pascual River clean up about the work of the Vaquerxs coalition in the East San

Gabriel Valley to address environmental justice issues facing our communities and the privatization of public land by developers. From #Bassett to the #ArroyoSeco, we fight developers. Special thanks to Clara Solis, lifelong family friend for inviting me to the River clean up and for inspiring me to take on the wealthiest developers that are displacing our communities with zero accountability from our regulatory or enforcement mechanism bodies."
instagram.com

From:
Sent: Monday, June 30, 2025 9:29 PM
To: Monde, Christina <cmonde@cityofpasadena.net>; Gordo, Victor; Madison, Steve; Rivas, Jessica; Masuda, Gene; Lyon, Jason; Jones, Justin; PublicComment-AutoResponse <correspondence@cityofpasadena.net>
Subject: Please vote for a full EIR — Save San Pascual Park - Restore the Arroyo Seco

Hello Everyone,

As an Eaton Fire survivor (displaced since January 7th) ecological health and the existential threat of urban and wildfire interface toxicity is front and center of my everyday life. Fighting the "deny, delay, and dismiss" tactics of a corrupt insurance industry has become a full-time job (on top of everything else) for thousands of folks in Altadena and Pasadena so, I want to apologize, for my late comments here—making it just in time for the June 30th cut off. The below is for your consideration—in relation to your Environmental Impact Report (EIR) concerning Pasqual Treatment "Watershed" Project.

Pasadena and South Pasadena are proposing a short-sighted and irresponsible $14 million program - the Arroyo Seco "Water Reuse" Program (San Pasqual Treatment Project) — that will permanently degrade the Arroyo Seco and set back efforts to restore its natural health and beauty. The "reuse" program will clutter the Arroyo stream zone in Pasadena, South Pasadena, and Los Angeles with pipes, plumbing, underground tanks, mechanical treatment facilities, fake "wetlands," and industrial equipment to irrigate a park and golf course.

Considering the toxic load from the Eaton-Fire upon neighboring soil and local water municipalities— the optics of San Pasqual (artificial) "Wetland" Treatment Project is quite a greedy hustle—the city is currently battling some real toxicity from the urban and wildfire interface. Soil, water, human, plant animal, and insect HEALTH and SAFTEY should be top priority in your updated EIR environmental impact report—*all things considered.* *Mini golf being is the last thing you should be spending tax payers dollars on.*

I dare you to be Promethean in your thinking. I urge Pasadena and South Pasadena reconsider effective, sustaining nature-based rehabilitation in the existing riparian biodiversity of San Pasqual Park. Healthy, science-based and evidence-based approaches are inherent to restoring native wetlands and healthy waterways both seasonally and for the long term for future inhabitants. Nature-based systems work—and have been done all over the US and the world.

As a resident of Pasadena and San Pascual Park user, I am asking that the EIR for the Arroyo Seco Water Reuse Project include the following:

Negative Impacts Include:

1. The removal of over 140 mature trees and bushes, and their replacement with small saplings.
2. Removing 175 Million gallons of water from the Arroyo Seco annually, with only 40% of it being returned to the river.
3. The loss of Los Angeles parkland to local residents currently used and enjoyed by all.
4. Removal of water source supporting local wildlife —which has been taxed by the Eaton Fire.
5. Loss of a local riparian ecosystem habitat, and an important wildlife corridor connecting to the San Gabriel Mountains.
6. Loss of birds and animals whose habitat will be lost for more than 2 years.
7. Dust and noise pollution from demolition and construction due to the loss of trees that currently act as a barrier for the noise.
8. Light pollution - Mature trees shield the community at night from the sports field lights and from vehicle headlights.

9. Air quality due to loss of green canopy purifying from freeway toxicity. Show clear data.
10. Heat islands that will last for at least 15 years, A mature canopy can recapture its cooling benefits. Detail the water loss in the wetlands due to evaporate on throughout the year.
11. Water capture at the site will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:
12. Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, traditional insights, knowledge, tools, technology and mitigation.
measures on protecting the land, water, wildlife and cultural resources.
13. Alternatives to the proposed project that includes nature-based methods that consider stream restoration.
and wildlife habitat preservation and the re-introduction of Steelhead Trout.

14. EIR must address the issue of cleaning the pollution at the source. The proposed cleanup at San Pascual will not address the pollution going into the river from known sources. Project proposed will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river.
15. Exploration of alternative areas that do not require the destruction of the current ecosystem.
16. Provide current and clear data on Arroyo Seco contamination sources (not 15-years-old data). Include current contamination (on data from above the San Rafael project area to the South Pasadena Golf Course, and downstream from it.
17. Clear and transparent data showing how much water is diverted to the Golf Course, infiltration and irrigation, or wetland. Show support, and how it shfits during each season or during times of drought.
18. Details on how the area will be maintained by Pasadena/South Pasadena in perpetuity. Address the impacts during the 30-year proposed maintenance schedule. Provide scope of responsibility after 30 years. Provide legal information whether granting land in perpetuity violates the LA Charter 594c.
19. Seeks input from community members and takes this information on into active solutions.
20. Include a "no-build" option that assesses the impact of that option.
21. What are the benefits to LA City residents? What water will LA City receive? How much will the South Pasadena Golf Course pay for the water they will receive in perpetuity? If LA Recreation and Parks receive any money will it be in perpetuity?
22. A detailed biological survey that observes all wildlife using the area, done during multiple visits, assessing the impact this project will have on them.
23. A detailed study of the archeological impact that this project could have, both of tribal artifacts, human burials, and fossilized species. Will construction continue if archeological items are found? Who will be monitoring this?
24. Provide proof of State Water Rights to divert water from the Arroyo Seco tributary to South Pasadena land.
25. **Soil Testing and Water Testing in San Pasqual Park for JPL related toxicity before toxic "dusty digs" (what happened for years within the Hahamongna Watershed Project) Read JPL's Project Backgrounder:**
https://jplwater.nasa.gov/?id=1.projectbkg
26. Additional public comments are needed as the city needs transparency and public accountably.
27. **Toxicity data and how the project is in relationship to the Eaton Fire — Pasadena and South Pasadena's New Toxic Reality.** What is essential now? Is this project essential to preparing for the next climate disaster? Essential for community healing? rebuilding? How can it be more effective, healthier? Superfund Sites may be providing "wider margins" for cleanup: CalMatters: AB 1243: Polluters Pay Climate Superfund Act of 2025 https://calmatters.digitaldemocracy.org/bills/ca_202520260ab1243

More regarding Stressed Water Systems: https://innovation.luskin.ucla.edu/wp-content/uploads/2021/12/Wildfire-and-Water-Supply-in-California.pdf

> "These fires tested the physical and financial limits of our water infrastructure," said Gregory Pierce, co-director of the Luskin Center for Innovation. **"We need to think not just about fixing pipes, but about re-designing systems and supporting populations that are more integrated, more equitable, and resilient to the next crisis."**

- Mutual water systems like Las Flores and Lincoln Avenue have limited access to public recovery funds and are exploring legal and governance pathways to secure support.
- Estimates of damage vary widely, from minor to near-total infrastructure loss. For example, Las Flores Water Company lost 75% of its revenue base.
- San Pasqual project should take into consideration the LARGER PICTURE of water health and usage along the Arroyo Seco.

JPL Superfund = "Pollution at the source"

As a neighbor living near Hahamonga watershed (groundwater Raymond basins) – I'm quite non-plussed at Pasadena's handling of groundwater systems there. The BIG DIG was toxic and dusty and I'm sure, San Pasqual Park would have similar adverse health affects due to digging. Air Quality in the LA Basin is already insanely unhealthy. As an EPA Superfund site, JPL **was dangerously close to being engulfed in flames—placing locals and cities around Los Angeles in danger of Chernobyl-like devastation.** Pasadena needs to put in place a PUBLIC emergency system/protocol should JPL be in the line of fire again.

Hahamongna Watershed as of July 2, 2025:
KNOW about JPL's Project Backgrounder: https://jplwater.nasa.gov/?id=1.projectbkg

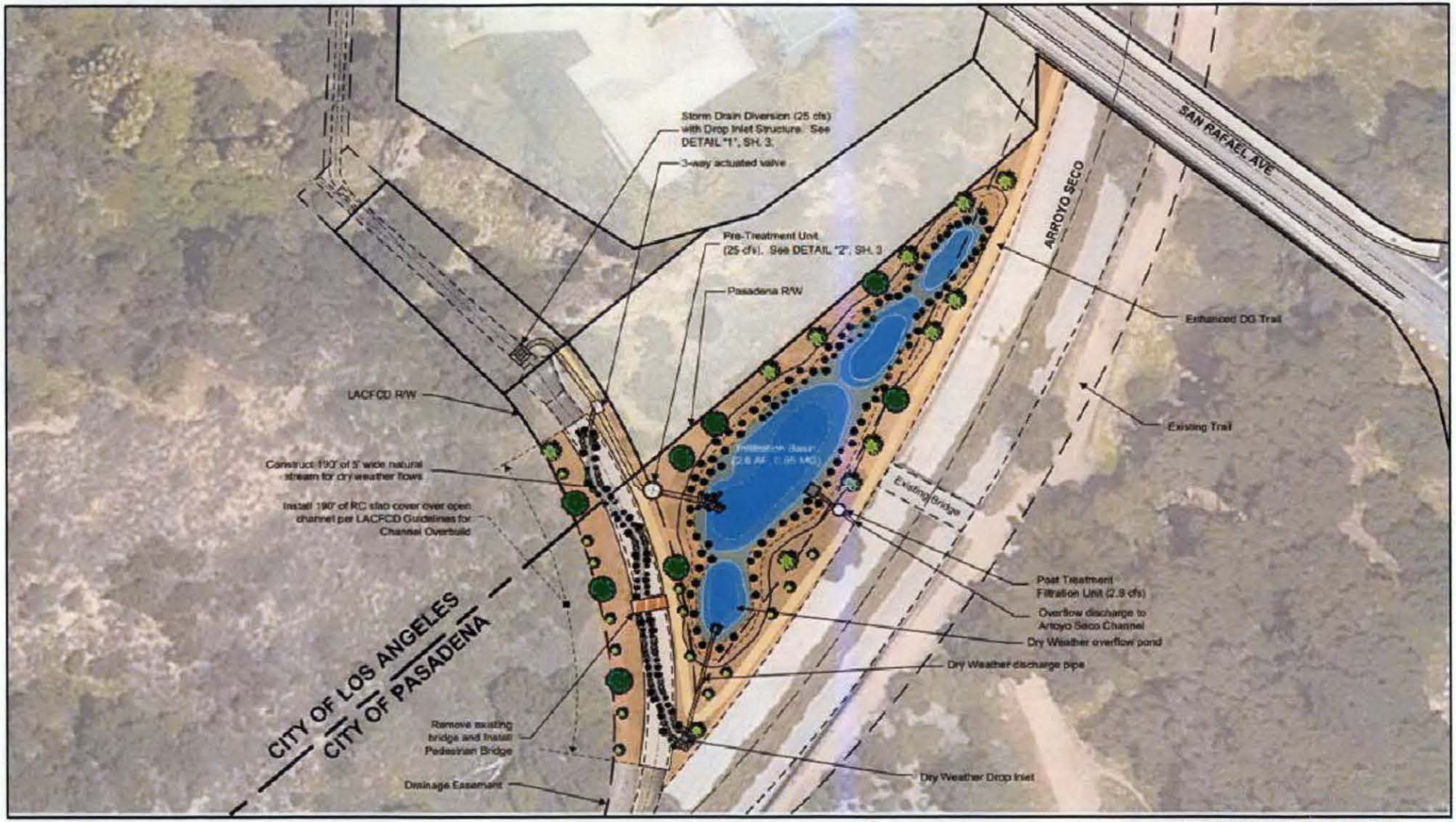
Thank you for your time.

Pasadena is in desperate need of "good optics" on ecological initiatives to ensure better, healthier days ahead for future generations. Your choices have powerful consequences. Your position—your actions, words, and deeds—affect all in this community. Holding onto our humanity—*our living nature*—is tantamount for the survival of ALL in this chaotic, climate change. Given the trauma this community is going through, every dollar, every choice, Pasadena and South Pasadena spends — I pray—helps to alleviate further suffering and puts an end to destruction by corruption and greed.

Thank you for considering my comments.
Please confirm you have received this.

In community,
Cate River
Pasadena Homeowner
Lover of the Arroyo Seco

Attachment A - Project Concept Plan
(Pasadena Location)



PLAN
Scale: 1" = 40'-0"

craft water engineering, inc.

PROJ. NO.	20012-ULARSRFS
DESIGNER	O. GALANG
DRAFTER	O. GALANG
CHECKER	C. HELMLE

DATE	MK	DESCRIPTION
REVISIONS		

PRELIMINARY CONCEPTUAL DESIGN

CITY OF PASADENA PUBLIC WORKS DEPARTMENT

ARROYO SECO - SAN RAFAEL TREATMENT WETLANDS PROJECT

REGIONAL STORMWATER CAPTURE PROJECT

SAN RAFAEL GENERAL SITE PLAN
NATURAL STREAM RESTORATION AND WETLAND BASINS

SHEET 1 OF 2

Attachment A - Project Concept Plan
(South Pasadena Location)



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EDUCATION

Soil samples from Pasadena schools show lead, other heavy metals. What does that mean?

By Mariana Dale, Ross Brenneman and Fiona Ng

Updated May 20, 2025 1:26 PM
Published May 16, 2025 8:51 PM



Pasadena Unified School District has released soil test results of all its campuses, including Octavia E. Butler Magnet pictured here, showing trace amounts of heavy metals at several schools.

(Julie Leopo / LAist)

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WHAT YOU NEED TO KNOW

Pasadena Unified School District released the results of soil tests this week, showing elevated levels of toxic metals at 13 campuses five months after the Eaton Fire.

Soil samples from Pasadena schools show lead, other heavy metals. What does that mean?

0:45

Pasadena schools that shut down during the peak of the Eaton Fire reopened by February, and parents have been concerned since then about the possible presence of harmful metals like lead and arsenic. The schools are among many sites in the Eaton Fire area that have recently found to have elevated levels of harmful materials.

Pasadena Unified contracted with Verdantas, a "state-licensed environmental consulting firm" to conduct the testing after the Los Angeles County Department of Public Health found properties downwind of the Eaton Fire were more likely to have elevated lead levels.

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Read more about fire recovery


Testing finds high lead levels in Eaton and Palisades fire burn zones


Daunted by the idea of rebuilding? LA County's new guide helps you make smart (and firewise) decisions


This Altadena restaurant's neighborhood is gone after the Eaton Fire. It's reopening anyway

What levels of lead are safe?

State and federal agencies set “screening levels” to help determine what areas may need further remediation.

“Generally, at properties where contaminant concentrations fall below soil screening levels, there is no health-related concern and no further action or study is warranted,” said the state’s Office of Environmental Health Hazard Assessment in a factsheet about lead contamination.

California’s threshold for acceptable levels of lead in the soil (80 milligrams per kilogram or less) is stricter than the federal Environmental Protection Agency’s (100-200 mg/kg).

AirTalk: What's next for Pasadena schools after soil tests show elevated levels of heavy metals in the soil?

17:59

What did the results show?

The company took soil samples from multiple sites at each school.

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The most common contaminant was lead, which occurs naturally in the environment, but is dangerous at elevated levels, particularly to young children. Exposure can cause behavior and learning problems and slowed growth among other problems.

The single highest concentration of lead found was at Blair High School (253mg/kg) near the tennis courts east of the Arroyo Seco

Parkway. For almost all the other sites where lead was detected, the highest concentration was in the 100-200 mg/kg range.

Where elevated levels of lead were found:

- Allendale Elementary
- Altadena Elementary
- Blair High School
- District Service Center
- Education Center
- Field Elementary
- Jefferson Childcare Center
- John Muir High School
- Longfellow Elementary
- Madison Elementary
- Marshall Secondary
- Octavia E. Butler Magnet
- San Rafael Elementary
- Washington Elementary

Where chromium, arsenic, or other heavy metals were found:

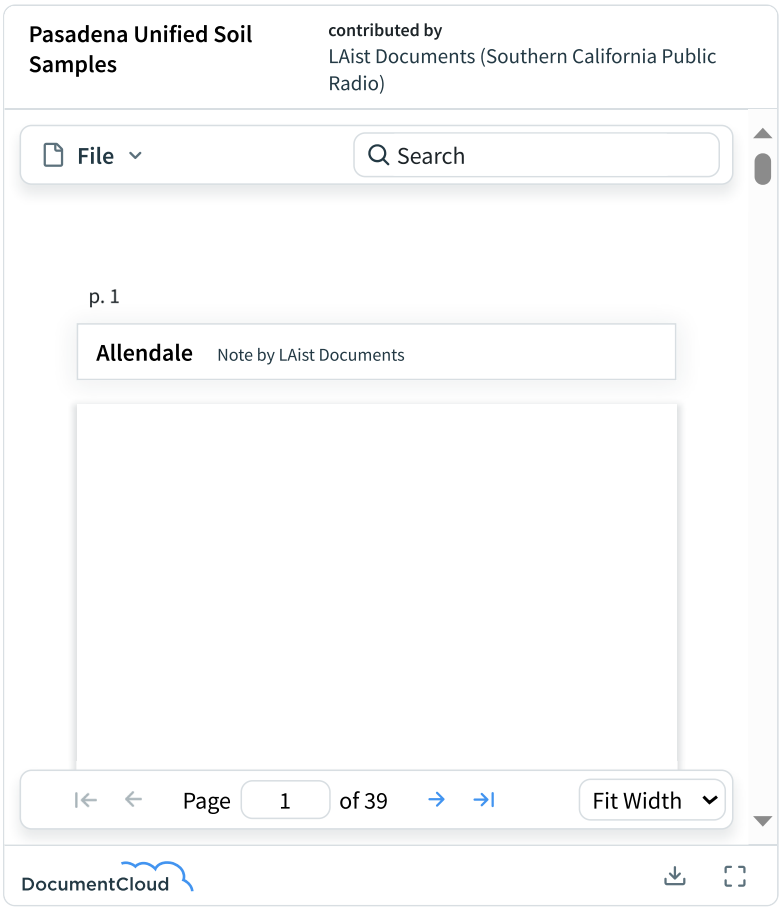
- Allendale Elementary
- Blair High School
- Field Elementary
- John Muir High School
- San Rafael Elementary
- Webster Elementary
- Cleveland Campus (Aveson and Alma Fuerte Charter)

Soil samples from Pasadena Unified

Pasadena Unified School District released the results of soil tests this week, showing elevated levels of toxic metals at 13 campuses five months after the Eaton Fire.

State and federal agencies set “screening levels” to help determine what areas may need further remediation. California’s threshold for acceptable levels of lead in the soil (80 milligrams per kilogram [mg/kg] or less) is stricter than the federal Environmental Protection Agency’s (100-200 mg/kg).

See all the samples



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Reaction from one parent

Mayka Mei is an Altadena resident and a PUSD parent. Her family has been temporarily displaced from the Eaton Fire and is planning to return to their home in weeks.

After the reopening of all the schools in the district, Mei waited to take her daughter back to Field Elementary — to her original classroom, no less — until cleaning of the HVAC system was complete.

"I am very frustrated at the district. A lot of parents feel the same way, and here we are. All these parents and families, we hope to trust the district in doing thorough testing," Mei said about the soil test results. "So right now there's a lot of distrust."

Things Mei and the parents she's talked to want to see are continued testing, ongoing remediation and full transparency from the district going forward.

Mei said an area close to her daughter's classroom garden is one of the sites found with the highest levels of harmful substances. "Which is kind of heart wrenching because it was really important for me and for her to return to that specific classroom. So I don't want to uproot that," she said.

But if trust can't be reestablished, Mei said she might have to exercise the option.

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"People are incensed. And what we've got to do then, for a district that's already suffering financially and emotionally, is really stabilize the community that exists. Because otherwise, why would those families come back?" Mei said.

What's next?

The district said that schools have restricted access to outdoor areas with elevated levels of harmful substances. The district plans to consult with Pasadena and L.A. County Department of Public Health to review the results and create a plan to remediate affected areas. The district also indicates that more test results may be coming.

“We want to be abundantly clear: Safety is not negotiable,” PUSD Superintendent Elizabeth Blanco said in a statement. “That’s why we’re moving forward with both urgency and care. We are grateful to our school communities for their patience as we work to ensure that every student and employee has a safe environment to learn and grow.”

In a statement Monday, PUSD said its cleanup efforts will be done before the start of the next school year and include additional testing.

Superintendent Blanco also issued a message to district families Sunday that included a statement from Pasadena’s acting health officer, Parveen Kaur.

"While some PUSD soil test samples exceeded California state lead screening levels, most were at levels where the risk to human health is minimal, especially when public health safety precautions are followed," Kaur wrote. "In areas that exceeded the screening level, common sense measures such as restricting access and adding ground cover will reduce potential risk of exposure."

How to attend a board meeting

The Pasadena Unified Board of Education next meets on Thursday, May 22 at 4:30 p.m.
The district said in a statement that the soil test results will not be on the agenda.

Location: Elbie J. Hickambottom Board Room #236
351 S. Hudson Ave., Pasadena

Virtual viewing: Regular meetings are broadcast live on Charter Cable Channel 95 and at http://live.boardmeetings.info.

CORRECTED MAY 17, 2025 AT 4:09 PM PDT

A previous version of this story mistakenly listed chromium as one of the metals found at Altadena Arts.

UPDATED MAY 17, 2025 AT 9:51 AM PDT

We updated the story with an interview with a Pasadena Unified parent.

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Project Backgrounder - Overview of NASA's Comprehensive Groundwater Cleanup Plan at and in the Vicinity of the Jet Propulsion Laboratory (JPL)

For Media Contacts and Credentialing info, click here

A Commitment to Safeguard Area Drinking Water and Restore Water Resources

NASA is committed to cleaning up groundwater affected by chemicals associated with historic and long-discontinued waste disposal practices at the Jet Propulsion Laboratory (JPL). NASA is cleaning up the site under the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund. The groundwater chemicals being addressed by NASA are volatile organic compounds (VOCs), perchlorate, and Per- and Polyfluoroalkyl Substances (PFAS) that were recently added by EPA to be investigated under CERCLA. While NASA takes the lead for environmental investigations and cleanup activities associated with JPL, federal and California regulatory agencies provide oversight, including the:

- U.S. Environmental Protection Agency (EPA),
- California Department of Toxic Substances Control (DTSC), and
- Regional Water Quality Control Board (RWQCB), Los Angeles Region

A Signed Final Cleanup Plan

The groundwater cleanup program achieved a major milestone early in 2018. NASA and the regulatory agencies approved and signed a final cleanup plan referred to as the final Record of Decision (**ROD**). The parties agreed that continuing the operation of the three groundwater treatment plants [see below] at and near JPL is "the best approach to reaching the cleanup goals and maintain protection of human health and the environment." NASA prepared a **fact sheet** summarizing the investigations and remedial actions that led to approval of the ROD.

Three NASA-Funded Groundwater Treatment Plants Will Continue Under the Final Plan

- One of the NASA-funded groundwater treatment plants is located on JPL property and has been successfully removing groundwater chemicals from the source area since January 2005.
- Another plant is removing groundwater chemicals from the farthest reaches of the area affected by the chemicals – at wells operated in Altadena by the Lincoln Avenue Water Company (LAWC).
- A third plant on City of Pasadena-owned property adjacent to the Windsor Reservoir— the Monk Hill Treatment System (MHTS)—is providing groundwater cleanup in the area between the source of the chemicals and the farthest reaches. Pasadena Water & Power (PWP) has been able to re-open previously closed water production wells located in the Arroyo Seco and serve treated water from those wells to its customers.

The combination of these three treatment plants working together will complete the cleanup over the next 10-15 years.

JPL Site Cleanup Activities: A Brief History

Soil Cleanup

Even before the groundwater treatment plants were operating, NASA used a technology called soil vapor extraction (SVE) to remove 230 pounds of carbon tetrachloride and 30 pounds of trichloroethylene (TCE) from the dry soil directly beneath JPL. By removing this source of chemicals, NASA eliminated further chemical movement from the soil into the aquifer hundreds of feet below the ground surface. This SVE was completed in 2007.

Groundwater Treatment at the Source Area

NASA's source area groundwater treatment system, located in the north-central section of the 150-acre JPL complex, focuses on an eight-acre by 100-foot-thick portion of the aquifer deep beneath the ground surface.

- A liquid-phase granular activated carbon (LGAC) technology is being used at the JPL source area to trap dissolved VOCs for subsequent disposal at licensed off-site facilities.
- To break down and eliminate perchlorate from groundwater beneath JPL – from system startup in January 2005 to late 2019 – the system originally used a fluidized-bed reactor system with naturally-occurring organisms. With considerably lower levels of perchlorate in the source area groundwater by 2019, a new ion exchange perchlorate-removal technology and a new groundwater extraction well were installed and became operational in 2020. The new ion exchange technology is proven to be more effective than the previous technology at treating low levels of perchlorate.

be more effective than the previous technology at treating low levels of perchlorate

By the middle of 2022, the total amount of unwanted chemicals in groundwater beneath JPL has been reduced by more than 98 percent. The system has removed more than 2,137 lbs. of perchlorate and more than 49 lbs. of VOCs since startup.

While chemical removal has been significant, cleanup needs to continue. Reduced groundwater chemical levels are still above the stringent cleanup goals set forth in the final cleanup plan outlined in the 2018 Record of Decision. Continued operation of the systems to achieve those cleanup goals is expected to take another five to ten years. This is typical in groundwater remediation because chemical removal becomes more difficult as concentrations decrease. It takes a long time to flush enough water through the aquifer to achieve the cleanup goals in the ROD.

NASA's strategy to target chemicals at the source area is helping to:

- Remove chemicals from groundwater at the source area, where the highest levels of the chemicals are found, and
- Reduce migration of chemicals to offsite groundwater beneath areas near JPL.

Groundwater Treatment with Lincoln Avenue Water Company

Since 1992, the Lincoln Avenue Water Company (LAWC) has operated a NASA-funded treatment plant, removing VOCs from LAWC's water production wells in Altadena. In 2004, NASA funded the expansion of that plant to remove perchlorate from the groundwater, enabling LAWC to provide its customers with a continuous supply of drinking water that meets all state and federal clean drinking water standards. NASA also funded construction of a third drinking water well for LAWC, which was put into operation in late 2017.

Groundwater is treated by the LAWC plant at a rate of up to 2,000 gallons per minute (gpm). The system uses an ion exchange perchlorate-removal technology, while VOCs are removed from the groundwater with a liquid-phase granular activated carbon (LGAC) technology. By the middle of 2022, the system had removed more than 1,427 lbs. of perchlorate and more than 343 lbs. of VOCs. In all, since 2004, the three wells and associated groundwater treatment have reduced total chemical concentrations in the LAWC groundwater by nearly 85 percent.

Groundwater Treatment with City of Pasadena

In the spring of 2011, the City of Pasadena began operating the NASA-funded Monk Hill Treatment System, or MHTS, near four previously closed water production wells located in the Arroyo Seco. The plant, with an operating capacity of 7,000 gallons per minute, is removing perchlorate from groundwater using ion exchange technology and VOCs using LGAC technology. By mid-2022 and since startup, the system had removed more than 1,405 lbs. of perchlorate and more than 227 lbs. of VOCs. Total chemical levels in groundwater extracted by the MHTS have been reduced by more than 90 percent.

New Well Construction Planned for MHTS

With NASA funding and technical support, Pasadena Water and Power (PWP) is planning to construct a new drinking water well located in the northern portion of the Arroyo Seco. The new well would help increase removal of targeted chemicals by an estimated 40 percent and would significantly reduce the time needed to clean up the aquifer. Groundwater from the new well would be piped to and treated at the Windsor Avenue plant along with water from the four existing wells. This new well would be strategically located to capture chemicals originating from the JPL site.

Groundwater Treatment Technologies' Effectiveness

Liquid granular activated carbon (LGAC) and ion exchange (IX) are two treatment technologies that have been shown to be effective in removing chemicals from groundwater. Both technologies are in place at three NASA-funded groundwater treatment plants – one located on JPL property; another in Altadena operated by the Lincoln Avenue Water Company (LAWC); and a third plant operated by the City of Pasadena. These technologies have been effectively removing perchlorate and VOCs from groundwater as part of NASA's CERCLA groundwater cleanup program at JPL.They have also proven to be effective in removing emerging chemicals including PFAS. The treatment systems enable LAWC and the City of Pasadena to provide their customers with a continuous supply of drinking water that meets all state and federal clean drinking water standards.

Groundwater Monitoring – Well Water Sampling

Scientific research is central to NASA's objective to implement a sound and comprehensive cleanup. Using various methods, NASA continually seeks to evaluate conditions and the extent and movement of chemicals in groundwater. Quarterly groundwater samples are taken from the 25 NASA monitoring wells located throughout the area. Results are placed on the NASA water cleanup website

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+ Contact NASA

at ***https://jplwater.nasa.gov***.

Annual Institutional Control Reports

The approved final cleanup plan (i.e., ROD), signed in February 2018, included requirements for an annual Institutional Control (IC) report to ensure the effectiveness of ongoing groundwater treatment and prevent exposure to impacted groundwater at JPL. Those IC reports have been filed in each year and placed on the NASA water cleanup website at ***https://jplwater.nasa.gov***.

Regulatory Oversight Continues

Version 3.0_2013.10.01

Cleanup at and in the vicinity of JPL continues under CERCLA requirements, which include a required review of cleanup efforts every five years. An initial Five-Year Review was completed in February 2012; a second was completed in January 2017; and a third Five-Year Review, covering the calendar years from 2017 to 2021, has now been completed, approved by federal and state regulators, and filed. All three Five-Year Reviews determined that – with EPA concurrence in each case – the three NASA-funded groundwater treatment systems currently in place, combined with NASA's comprehensive groundwater monitoring system, continue to be "protective of human health and the environment."

Factsheets on each of the Five-Year Reviews have been placed on the NASA water cleanup website at ***https://jplwater.nasa.gov***.

AB 1243: Polluters Pay Climate Superfund Act of 2025.

Session Year: 2025-2026

House: Assembly

Current Status:

IN PROGRESS

(2025-04-29: In committee: Set, first hearing. Hearing canceled at the request of author.)

- [x] Introduced
- [ ] First Committee Review
- [ ] First Chamber
- [ ] Second Committee Review
- [ ] Second Chamber
- [ ] Enacted

Summary | Bill Text | Status | Votes | Supporters & Opponents | Analysis

Version:

Amended Assembly (4/10/2025)

The California Global Warming Solutions Act of 2006, until January 1, 2031, authorizes the State Air Resources Board to adopt a regulation establishing a system of market-based declining aggregate emissions limits for sources or categories of sources that emit greenhouse gases (market-based compliance mechanism) that meets

certain requirements. Existing law establishes the Greenhouse Gas Reduction Fund and requires all moneys, except for fines and penalties, collected by the state board from the auction or sales of allowances as a part of a market-based compliance mechanism to be deposited into the fund and requires the Legislature to appropriate moneys in the fund for the purpose of reducing greenhouse gas emissions in the state, as provided.

Existing law, the California Climate Crisis Act, declares that it is the policy of the state both to achieve net-zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net-negative greenhouse gas emissions thereafter, and to ensure that by 2045, statewide anthropogenic greenhouse gas emissions are reduced to at least 85% below the 1990 levels.

This bill would enact the Polluters Pay Climate Superfund Act of 2025 and would establish the Polluters Pay Climate Superfund Program to be administered by the California Environmental Protection Agency to require fossil fuel polluters to pay their fair share of the damage caused by greenhouse gases released into the atmosphere during the covered period, which the bill would define as the time period between the 1990 and 2024 calendar years, inclusive, resulting from the extraction, production, refining, sale, or combustion of fossil fuels or petroleum products, to relieve a portion of the burden to address cost borne by current and future California taxpayers. The bill would require the agency, within 90 days of the effective date of the act, to determine and publish a list of responsible parties, which the bill would define as an entity with a majority ownership interest in a business engaged in extracting or refining fossil fuels that, during the covered period, did business in the state or otherwise had sufficient contact with the state, and is determined by the agency to be responsible for more than 1,000,000,000 metric tons of covered fossil fuel emissions, as defined, in aggregate globally, during the covered period.

This bill would require the agency, within one year of the effective date of the act, to conduct and complete a climate cost study to, among other things, quantify the total damage amount, which the bill would define as all past and future climate harms and damages to the state from January 1, 1990, through December 31, 2045, inclusive. The bill would require the agency to update the climate cost study, not less frequently than every 5 years, through January 1, 2045, as provided. The bill would require the agency, within 60 days of the completion of the climate cost study, to determine and assess, as provided, a cost recovery demand for each responsible party listed, which represents the responsible partys proportionate share of the total damage amount. The bill would require responsible parties to pay their cost recovery demand, as provided. The bill would require the collected cost recovery demands to be deposited in the Polluters Pay Climate Superfund, which the bill would create in the State Treasury. The bill would, upon appropriation by the Legislature, require moneys in the ~~Polluters Pay Climate Superfund~~ fund be expended for, among other things, qualifying expenditures, which the bill would define to include expenditures for projects and programs to mitigate, adapt, or respond to the damages and costs caused to the state from climate change. The bill would require all interest earned on moneys that have been deposited into the fund to be retained in the fund for use in implementing the program. The bill would require the agency to determine the initial implementation costs for the act, as provided, and would require the agency to assess an amount allocated equitably among responsible parties to cover those costs.

This bill would require the Director of Finance, within 45 days of the effective date of the act, to perform an initial assessment of the reasonable and appropriate initial implementation costs that will be incurred by the agency.

This bill would declare that it is to take effect immediately as an urgency statute.



BRIEFING PAPER • DECEMBER 2021

WILDFIRE & WATER SUPPLY IN CALIFORNIA

ADVANCING A RESEARCH & POLICY AGENDA

Gregory Pierce, Peter Roquemore, and Faith Kearns

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
California Institute for Water Resources

UCLA Luskin Center for Innovation

AUTHORSHIP

This report was produced by University of California Agriculture and Natural Resources (UC ANR), California Institute for Water Resources and the Luskin Center for Innovation (LCI) at the University of California, Los Angeles (UCLA). It was authored by the following researchers:

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» Peter Roquemore, project manager, LCI

» Dr. Faith Kearns, academic coordinator, California Institute for Water Resources

The report is based on input from 23 workshop participants as listed on page 15.

ACKNOWLEDGEMENTS

Funding for this research was provided by the U.S. Geological Survey through the California Institute for Water Resources. We also thank Lauren Dunlap for editing and designing this report.

We acknowledge the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), ‘Ahiihirom (Elders) and ‘eyoohiinkem (our relatives/relations) past, present and emerging.

FOR MORE INFORMATION

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Cover photo: VladTeodor / iStock.
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OVERVIEW

The linkages between wildfire and water are numerous, and many of them are relatively well researched, such as the effects of wildfire on riparian areas. However, in recent years, a newer issue has emerged: the relationship between wildfire and water supply. Some aspects of this topic are relatively well understood, such as how higher elevation wildfires might impact water storage reservoirs through siltation. Other aspects are less understood, such as how wildfires lead to drinking water contamination.

During the Tubbs (2017), Camp and Woolsey (2018), and CZU Complex (2020) Fires, in particular, community water systems were affected in various ways, presenting a new set of issues. The Tubbs and Camp fires "are the first known wildfires where widespread drinking water chemical contamination was discovered in the water distribution network and not in the source water after the fire" (Proctor et al. 2020).

To address the recent emergence of wildfire-caused drinking water contamination, we asked a group of interdisciplinary and cross-sector participants to provide input and review on a research and policy agenda for how California can more proactively address the ways in which wildfire is increasingly putting water supply systems at risk. Workshop sessions were focused on four different research and policy issues and related questions at the intersection of wildfire events and water supply provision:

1. Upstream Wildfire Effects on Water Supply

- How can forest and other ecosystem management help mitigate fire's effect on downstream water flows?
- Should we expect upstream post-fire water quality impacts to evolve qualitatively or just quantitatively?
- How can disaster management efforts in the state better address post-fire water supply impacts upstream?
- How can research efforts better support Indigenous leadership, knowledge, and practice to help manage healthy ecosystems?
- What are the most effective methods to support long-term forest and other ecosystem management to adapt to upstream effects?

2. Water Supplier Planning

- What can be done to proactively mitigate and reactively address damage to water reservoirs?
- How can water systems be supported to maintain power and continuous supply during a fire?
- How should water systems be expected to finance fire-fighting efforts?

3. Water Supply, Fire, and Housing

- What are the impacts of new fire-sensitive building codes and regulations on long-term residents?
- How can displaced communities (re)gain access to affordable housing and essential services?
- How do we rebuild damaged plumbing infrastructure that is resilient to fire/reduces the contamination impacts experienced in communities?

4. End-use Water Quality and Public Health Impacts After Fire

- Are new or enhanced drinking water regulations for testing and treatment needed to better address near or at point-of-use drinking water quality impacts from wildfire?

- Who should provide emergency water supply, and what scale is feasible given the cost?
- How can we improve post-fire response guidance and testing support to improve communities' trust in water quality?

This document contains a high-level summary of initial research and policy gaps, as well as key questions to be answered, identified by UC ANR and UCLA and refined by workshop participants. The organization of and dividing lines between topics as presented here are necessarily overlapping. This report serves as an agenda for conversation, but does not contain final answers.

1. UPSTREAM WILDFIRE EFFECTS ON WATER SUPPLY

California's drinking water supply has relied on the health of upstream alpine forests, chaparral, and grasslands to collect, filter, and deliver rainfall and snowmelt to groundwater, rivers, streams, and reservoirs. However, the unprecedented frequency, scale, and intensity of wildfires in recent years—as well as a return to extreme drought conditions—can damage the health of these critical environments, with high associated economic costs (Headwater Economics 2018).

Headwater ecosystems in particular play a critical, initial role in the water supply which is ultimately delivered to communities through piped infrastructure. In California, 60 percent of potable water is sourced from forested watersheds, the majority of which flows from the forests of the Sierra Nevada mountain range (Uzun et al. 2020; McCann et al. 2020). These flows are also variable, leaving aside the altering effects of fire and the increasing variability that comes with climate change, so it is important to incorporate variability in the models to show where we will likely see change due to fire (Maina and Siirila-Woodburn 2019).

The rapid onset of climate change impacts such as drought, severe heat, and wildfire are disrupting the health and stability of upstream ecosystems. These landscape-scale disturbances can cause downstream impacts (including changes in water quantity and quality as well as hazardous debris flows) that can be costly for water suppliers to manage and recover from. The slow and costly implementation processes for CEQA and NEPA can potentially complicate quick and proactive land management projects to mitigate the occurrence or severity of wildfire events. Mitigating future impacts of wildfires on downstream community water supplies thus invites new strategies which can be supported

by answering research and policy questions in the following key areas.

▶ How can forest and other ecosystem management help mitigate fire's effect on downstream water flows?

The quantity and predictability of water flow delivered downstream is affected by changes in upstream environments. High intensity fires, like those California has experienced in recent years, can create long-term ecosystem changes, such as a decrease in transpiration from removing vegetation. They may also create a hydrophobic pyrogenic organic matter (POM) layer that increases runoff volume. Additionally, Maina & Siirila-Woodburn (2019) found that burned landscapes in the Sierra Nevada may accumulate more snowpack, increasing the runoff during a summer melt and altering timing of runoff due to the amount of water stored in snowpack. The timing of a return to "normal" flow regimes varies. Flint et al. (2019) found a return to pre-fire stream flows in two to four years in burned landscapes studied.

Large burn areas from intense fires also produce high risk conditions for erosion, debris flows, and landslides, imperiling local communities and downstream water infrastructure. A recent study suggests that water supply improvements of up to 14 percent can be found through prescribed burns, cultural burns, and mechanical thinning (McCann et al. 2020). However, more evidence is needed on this front, both in terms of predictability of estimates of interventions and to restore flow at more meaningful levels as we see increased fire activity.

▶ Should we expect upstream post-fire water quality impacts to evolve qualitatively or just quantitatively?

Hotter, faster, and bigger fires have altered upstream ecological processes and affect downstream water supply operations, motivating new ways of thinking about managing and remediating upstream environments. Historical research on burned areas in California provides insight into predicting and planning for post-fire water quality impacts downstream (Hohner et al. 2019).

High intensity fires turn biomass into pyrogenic organic matter (POM) on the surface of the forest floor. During post-fire rains, severely burned areas deliver higher levels of precursors to disinfectant byproducts, dissolved organic nitrogen, and dissolved organic matter with higher turbidity, color, and suspended particles downstream.

These constituents all require intensive treatment to meet potable water standards and thus higher cost. High concentrations of contaminants can be detectable for up to two years, depending on the scale of the fire and precipitation patterns the following years (Uzun et al. 2020).

▶ How can disaster management efforts in the state better address post-fire water supply impacts upstream?

Natural disasters occurring in California can cascade like a set of dominos, passing the effect of each disaster to the next, compounding impacts on frontline communities. Drought increases risk of fire in forests and wild lands leading to larger, faster, and hotter fires that burn at higher elevations, destabilizing snowpack and snowmelt cycles, and leave large burn scars with damaged soils that leads to increased and unpredictable runoff (AghaKouchak et al. 2018).

The increase in runoff from burned landscapes increases the risk of erosion, debris flows, and flooding in steep, mountainous watersheds during California's heavy rainy season. A study of Southern California burned slopes indicates landslide risk remains up to three years after a fire (Rengers et al. 2020).

Debris flows threaten infrastructure near and far. Communities in the wildland urban interface face immediate risk, while water supply infrastructure further downstream may be damaged by debris carried over long distances if upstream debris catchment solutions are not adequately deployed.

Research on catchment basins in Los Angeles County in areas burned by the Colby and Fish fires suggests that as vegetation returns to burned landscapes, sediment flows reduce. Continued research into the relationship between burned landscapes and catchment basins can aid policymakers in preparing for future impacts (Gray 2019).

A number of state and federal agencies respond to natural disasters in California today including the California Office of Environmental Services (Cal OES), local OES offices, the Federal Emergency Management Agency, California Department of Forestry and Fire Protection (CAL FIRE), California Highway Patrol, and nonprofit volunteer organizations like the Red Cross respond to disasters in California (UCANR 2020). It is also critical to support local organizations, including Fire Safe Councils, to do this work and create jobs locally. Currently, the patchwork system of grant-funded opportunities for local efforts means that organizations are applying for and managing funding, which takes away from the on-the-ground work.

The deadly mudslides in Montecito in 2018 after the Thomas fire are a grim call for researchers and policymakers to conduct further research to understand the impacts of, and how best to prepare and respond to, the cascading natural disasters in California today. A *Los Angeles Times* investigation details decades of tensions between the U.S. Forest Service, Army Corps of Engineers, Santa Barbara County officials, and the public over the appropriate deployment and maintenance of debris catchment basins and disaster preparedness interventions, none of these groups had thought the devastation Montecito experienced was possible (Mozingo 2018).

▸ How can research efforts better support Indigenous leadership, knowledge, and practice to help manage healthy ecosystems?

Indigenous nations and communities have long practiced ecosystem management strategies that include diverse applications of low-intensity fire. The use of fire created landscapes of widely spaced trees and low levels of forest floor flora. With successive waves of Spanish, Mexican, and American colonialism in California, Indigenous cultural fire practices were outlawed and replaced with a forest management strategy of fire suppression, which in turn resulted in forest densification and left forests vulnerable to fire, diseases, and pests (Hankins 2015; Goode et al. 2018).

Today, many tribal communities retain little autonomy over the stewardship of their ancestral lands. This lack of practical management authority severely limits their ability to apply traditional land stewardship mechanisms, including cultural burning. The inability to apply fire in turn decreases the health and resilience of culturally important plants. The overall lack of Indigenous stewardship creates conditions of increased vulnerability for both people and ecosystems faced with catastrophic fire.

There is also a need to incorporate the effects of cultural burning into fire modeling efforts. It is currently difficult to understand the full benefit of cultural burning in larger landscape management efforts. Much of the current research on cultural burns focuses on single burns in a specific context. There is a need for further study into how contemporary forest management and cultural burning can produce mutually beneficial

outcomes over larger geographic areas and long periods of time (Long et al 2021).

Progress has been made to engage cultural practitioners in ecosystem restoration in some contexts. For instance, the Karuk Tribe has developed a framework for a return to traditional management (Norgaard 2014). The Karuk Tribe now co-leads the Western Klamath Restoration Partnership, restoring a 1.2 million acre area, in partnership with the U.S. Forest Service (Durglo 2018). Moreover, the Yurok tribes are leading the Cultural Fire Management Council, which is a nonprofit with a mission to increase cultural burning on the Yurok Reservation and ancestral lands.

These efforts offer examples of how the State might be able to expand work with tribal leaders dramatically to achieve its aggressive forest sustainability goals (Buono 2020). There is great opportunity to expand partnerships with Indigenous peoples and Tribal communities, and potential collaborators should approach these partnerships with inclusivity and openness as knowledge and practice of various types of cultural burning are held across different Tribal community members (Lake 2021). The recently passed bills AB 642 and SB 332 will help to further support prescribed and cultural burning in the state (Larson 2021).

▶ What are the most effective methods to support long-term forest and other ecosystem management to adapt to upstream effects?

To limit the growth of large wildfires, an estimated 20–30 percent of California's 33 million acres of forested wildland must be managed and actively maintained through a mix of prescribed fire, managed wildfire, and mechanical thinning (McCann et al. 2020). Achieving the state's goals for managed forest requires intergovernmental and cross-sector cooperation. State and local governments only own three percent of forested lands in California with the majority owned by the federal government and private landowners. Forest management tactics like controlled burns must also align with regional air quality regulations, and policymakers must consider the equity implications for small landowners and tribal communities.

In 2020, California and the federal government signed a stewardship agreement that set a goal of treating one million acres of wildland in California each year. However, the state burned only 32,000 acres of wildland in 2020—well below that goal. An obstacle moving forward is matching funding and resources. California's final 2021 budget includes a recently-approved $1.5 billion for fire prevention (Beam 2021). Increasing wildland management means a long-term investment in personnel, training, and knowledge. However, the total amount of funding needed to implement long-term mitigation strategies is unknown (Feo et al. 2020).

To overcome the high cost of forest and other ecosystem management, agencies, nonprofit organizations, and private companies are coming together to pool resources. More of these kinds of new, inclusive, collaborative efforts are needed, including incentivizing private landowners to participate. There are examples of promising local and regional capacity building, such as the involvement of the Yurok Tribe with the Cultural Fire Management Council, and the formation of the Sierra Nevada Conservancy Watershed Improvement Program. Collaborative projects like the French Meadows Partnership managed by the Sierra Nevada Conservancy and the Forest Resilience Bond by Blue Forest are additional creative mechanisms for potentially scaling up the raising and targeted spending of forest management funds (Olick 2021).

To scale upstream management and restoration efforts, there is a need to increase engagement

of downstream users to raise their buy-in as stakeholders and emphasize the multiple benefits of fire hazard reductions and landscape management. As downstream impacts of wildfire are far reaching, downstream communities and leaders across sectors are potentially under-utilized and supported as financial, political, and logistical actors to effect upstream solutions.

Finally, in some cases, local community groups, both upstream (including fire safe councils) and downstream, will need financial support to participate robustly in decisionmaking processes. Supporting local participation, however, is essential to ensure sustainable management as well as equitable decisionmaking.

▶ Recommendations

- » Invest in local capacity and expertise, and communicate the multiple benefits of landscape management efforts in reducing fire risk and increasing water security.
- » Invest in debris management basins, particularly in rocky and mountainous areas close to highly urbanized areas, like those found in many Southern California communities.
- » Support Indigenous leadership, knowledge, and practice to help manage healthy ecosystems.
- » Develop sustainable funding streams to support local organizations, landowners, and stakeholders in inclusive and equitable headwater land management and restoration.
- » Conduct more research to determine with more precision how headwater forest and other ecosystem management, including cultural burning, affects the quantity and quality of downstream water supplies.

2. WATER SUPPLIER PLANNING

Wildfires bring new challenges to water system planners. The challenges include protecting infrastructure, treating increased contamination loads post-fire, cleaning water reservoirs, rebuilding destroyed infrastructure, and maintaining power and water access during a fire to, among other things, provide critical support to fire fighters. Water systems may also need to support their customers with interim drinking water during fire recovery and must ensure that the community can trust that tap water is safe as families and businesses return home. We need to identify policy and funding solutions to mitigate the impact of future fires on water systems and their ability to recover water quality quickly, provide water to displaced families, and restore trust in the tap.

California's current and expected intensity in future fire regimes presents new challenges for community water supply planners in many parts of the state. Wildfire is one of several climate threats that water utility planners are expected to account for, and the approximately 2,800 community water systems in the state have vastly different planning and operational capacities. Wildfire may threaten the processes to secure, store, treat, and deliver reliable water supplies to first responders and communities. The scale of the problem is evident in a recent Department of Water Resources estimate that "over half of the top at-risk [water] suppliers are in high or very high-risk zones for wildfire, as defined by CalFire" (2020 Water Resilience Portfolio). This is a water equity issue that leaves (often already vulnerable) communities to deal with compounding disasters.

The ability of water systems to maintain power during wildfires is critical for supporting firefighting efforts and minimizing damage to infrastructure. As systems divert water supply to help fight wildfire, and as fires contaminate

water sources, water suppliers face impairments to both water quantity and quality in their mandate to maintain reliable water delivery to communities. As noted above, the runoff and debris flows after a fire also deliver sediment and contaminant loads downstream that can critically impair water reservoirs.

Moreover, policy does not support water suppliers' direct and indirect financing of fire fighting activities, although it often represents an outsized portion of water supplier budgets which fireflow sometimes represents. The Governor's Office of Planning and Research, the Department of Water Resources, and the State Water Board have begun working on monitoring and support for this issue, but more attention and resources may be needed.

▶ What can be done to proactively mitigate and reactively address damage to water reservoirs?

Large water suppliers often rely on reservoirs to store surface water for delivery to end-users. Rainfall on expansive wildfire burn scars washes excess contaminants and sediment downstream into reservoirs, which can clog water system filters or fuel algal blooms in reservoirs (Chow 2021). Erosion and debris flows can also carry sediment into reservoirs, thus accelerating the decline of reservoir capacity. This is an especially troubling trend considering California's reliance on stored water during droughts (Sankey et al. 2017). Research by Becker et al. (2018) provides recommendations to water systems for treatment technologies and techniques needed for varied wildfire impact and contamination scenarios, a useful resource for water systems in wildfire prone areas.

Moreover, reactively cleaning impaired reservoirs is costly, with a common price tag of $5–10 million per reservoir cleaning (SNC 2021). Proactive investments can help to avoid accumulation of reservoir cleanup costs. For instance, the French Meadows Project—a $10.6 million collaborative effort between The Sierra Nevada Conservancy, Placer County Water Authority (PWCA), The Nature Conservancy, the American River Conservancy, and the Tahoe National Forest to restore 28,000 acres of headwater forest—is cost effective and proves that proactive management and investment can prevent future wildfire damage to PCWA reservoirs (USFS).

▶ How can water systems be supported to maintain power and continuous supply during a fire?

Water supply failures have several negative impacts during a wildfire. Emergency firefighting teams rely in part on operable water pumps, and have to take more ad hoc measures to secure water supply if pumps fail, as occurred in the Woolsey Fire of 2018 (Griffith 2018). Loss of water service to local hospitals and other vital facilities can compound the impacts of wildfire on a community. Additionally, loss of pressure in water service lines can allow soil and contaminants to enter the distribution system. Keeping water systems operable during a wildfire emergency can be difficult, as fire may damage water system infrastructure, spreading fire can leave key parts of water system infrastructure inaccessible, and backup power generators may fail.

Water systems need to invest in backup power supply to maintain operation of treatment facilities and pump stations during an emergency. Yet publicly-regulated water systems have expressed concern with complying with California Air Resources Control Board Rule 1470, which, due to emissions concerns, limits the allowable hours of testing the diesel-powered backup generators many systems rely on during fires. Water managers are advocating for the ability to test backup systems regularly to ensure they operate effectively while under stress

during a wildfire emergency (Carlson 2019). Compliant, lower-emission generators can cost $100,000 each (and are often ineligible for public subsidy funds from the State Board), take time to deliver and install, and require additional costs for regular maintenance, which water systems say constrains their ability to upgrade.

Additionally, asking water supplier staff to access water infrastructure as wildfires encroach place their health and safety of staff at risk from the fire and associated air quality. Innovations in remote operation of water system infrastructure and backup power systems like solar and battery technology, paired with building and site design to reduce fire damage, allow for some degree of offsite operation of water systems located in active fires that reduces risk to water system employees and maintains water operations for emergency use (Heaney et al. 2020). However, access to technology, the cost of these upgrades, and the managerial knowledge for implementation may be a limiting factor in water systems deploying these tactics, as these factors are more broadly constraining especially for small water system operation (Water Boards 2021). To protect the health and safety of their workforce, investments in air filtration and PPE are also recommended but may need centralized support.

More broadly, Tran recommends that, as part of their required emergency response plans (ERPs), water systems develop specific wildfire mitigation plans that include local or regional partnerships with surrounding water systems or water wholesalers with intertying supply connections (Tran et al. 2021). Developing these mutual aid relationships can lead to sharing of resource and critical staff and expertise support during an emergency. While ERPs are now required for systems serving 1,000 connections or more under SB 552, smaller systems may still lack the same ability to respond to and recover from disasters. A targeted toolkit that supports small water systems to address wildfire events, create and act on ERPs may be necessary. Finding ways to extend emergency planning support and expectations. to small water systems in wildfire prone areas is critical to ensuring water supply to the communities they serve.

▸ How should water systems be expected to finance fire-fighting efforts?

A large part of the way in which water systems are designed engineering-wise is to meet day-to-day fire-flow requirements. This compliance is necessary, but the associated cost can represent a large percentage of a water system's budgets and is not always called out as a specific expense in utility budgets (Tiger 2012). To the extent that water utilities face differential costs, they are usually obligated to pass on these costs to customers (see AWWA M1 Manual, 2017), especially among publicly-owned utilities in California due to Proposition 218.

The idea that the price of a good or service should reflect the cost of delivering that service to the user is referred to as cost causation or the benefit principle. This principle has been enshrined in internal drinking water utility practice to determine how to charge different users with different impacts on water supply production within a utility pricing structure (García-Valiñas et al. 2010-b). However, the connection between the cost of providing water supply for firefighting and specific charges on customers is lacking (Beecher 2020) and may undermine awareness of the need for additional revenue for water systems, especially in light of increased expectations that they serve on the front lines of supporting wildfire fighting efforts. Supporting small systems' ability to finance firefighting and broader emergency response efforts may require designated funding or regulatory guidance.

▶ Recommendations

» Provide recommendations to water systems for current and expected treatment technologies and techniques needed to treat runoff contamination.

» Better understand the challenges for big vs. small and private vs. public water systems, and consider the effects of water system consolidations on water system equity and security.

» Further invest in targeted support for water systems' continuous service in wildfire events. What kinds of funds are available for emergency drinking water provision?

» Clarify at the state level the financing authorities and constraints of fire-fighting efforts by water systems.

» Develop further support for small water systems to aid in their response to and recovery from wildfire, including a small water system toolkit and supporting and further developing existing mutual aid systems like CalWarn.

3. WATER SUPPLY, FIRE, AND HOUSING

With a year-long fire "season" and increasing fire frequency, size, and intensity, communities are facing challenging planning decisions required to keep people safe. They must consider the risk to housing from fire, as well as potential for development to contribute to fire ignition. They must also prepare for the risks of flooding and debris flows after the flames have been extinguished. Questions remain around the strategies and costs of providing adequate temporary housing for displaced families and rebuilding equitability.

Addressing the housing affordability crisis while actively planning for housing supply that takes sufficient account of water availability and wildfire risk is a tall order in California. In the past several decades, housing has grown dramatically in the "wildland urban interface," where fire risk is high. This is in part due to housing affordability in these areas and has also been facilitated by local decisions regarding the designation of fire severity zones (Miller et al. 2020). These zones parallel local variation in implementation of "show me the water" laws (Hanak 2010) in California. Additionally, there are strategies including buffers and other land use and urban design features to protect communities in high-risk zones (Moritz and Bustic 2020).

More specifically, post-fire housing recovery efforts in California have revealed major gaps in comprehensive short-term and long-term support for affected households, especially those that are socioeconomically vulnerable and mobility-constrained (Gabbe et al. 2020). People who have lost homes and have been displaced by wildfire struggle to access immediate housing and livelihood relief programs, including bottled water, and secure affordable housing options that include access to clean drinking water infrastructure. Moreover, as communities rebuild new and more expensive housing to meet new

fire safe housing codes, long-term residents face the impacts either of gentrification or experience long-term homelessness as interim assistance funds run low and housing is unattainable.

Communities who want to rebuild in fire-prone areas face feasibility challenges when trying to satisfy updated building codes which take account of both drought and fire risks. Agencies from the federal (FEMA), state (Housing and Community Development Department/HCD), and local levels (Local Agency Formation Commission/LAFCO, county and city housing authorities and planning departments, water systems) all have a role to play in this process. The HCD has developed a number of new, relevant programs but reports that many of them are under-utilized.

▶ What are the impacts of new fire-sensitive building codes and regulations on long-term residents?

During and after fires that displace entire communities and destroy or damage large numbers of housing units, many people face challenges in searching for or rebuilding new, long-term affordable housing. Burned homes leave behind toxic materials that pose a threat to the environment and local drinking water. Before homeowners are allowed to rebuild or reside on their property, the federal Environmental Protection Agency must complete a survey and removal of hazardous materials. Some types of housing, such as mobile home parks, must also show that in a rebuild they have come up to current state Housing and Community Development code to be officially habitable.

Additional local mandates, such as those imposed by the Santa Cruz County Board of Supervisors following the CZU Complex fire, require property owners to either hire a contractor or enroll in a government sponsored program to clean their property following the EPA inspection. However, owners who enrolled in the government program were subject to long wait times and had to find temporary housing in the meantime (Hagemann 2020a).

Other, broader regulations that are intended to make communities safer during a fire also make it harder for long-term residents to rebuild. For instance, in Santa Cruz County, proposed State Minimum Fire Safe Regulations impose new standards for road width for rebuilding to ensure emergency vehicle access, water supply, and defensible space. Property owners wishing to return to remote parcels to rebuild would be faced with the additional costs of funding road widening (Hagemann 2021).

▶ How can displaced communities (re) gain access to affordable housing and essential services?

Temporary housing is a direct lifeline to water access for many displaced by fire. In Santa Cruz County, Federal Emergency Management Agency funds provided hotel stays for 300 survivors of the CZU complex fire, with roughly one third of the enrollees extending their stay because they otherwise lacked access to clean water (Hagemann 2020b).

There is also increased concern around how wildfire-displaced populations affect surrounding communities and their infrastructure, including drinking water systems (Spearing and Faust 2020). An associated, open question is who should bear the cost of this impact on infrastructure, especially if displaced populations are served via temporary connections.

Some households that are uninsured and unable to afford rebuilding or relocating to new housing have turned to camping or living in mobile homes with no running water or electricity connection as they wait for relief from state or federal agencies—options that are technically illegal in some counties. Those with fire insurance still struggle to find housing as displaced families

across the region compete for housing and haggle with insurance providers over housing options and payments (Mozingo 2021). Others are legally or functionally left without access to assistance options due to their immigration status or language barriers (Mendez et al 2020; Mendez et al 2021).

The state legislature and Governor's office have taken steps to boost insurance relief for affected families; however, a study in 2017 found two thirds of fire victims were underinsured, leaving them without sufficient resources to rebuild or rehome (Swindell 2020). Mobile home park residents are particularly hard hit and can see housing costs more than triple when having to relocate or find temporary housing (Rode 2019).

▶ How do we rebuild damaged plumbing infrastructure that is resilient to fire/ reduces the contamination impacts experienced in communities?

One of the major obstacles to displaced populations returning to their property long-term is the cost of repairing water infrastructure. Following the Camp Fire of 2018, the town of Paradise faced a $300 million bill to repair its drinking water system alone, for a pre-fire population of 27,000 (Associated Press 2019). A cost of $10 million was estimated to replace all utility infrastructure damaged by the Woolsey Fire, which also occured in 2018, burning through Seminole Springs Mobile Home Park in the Santa Monica Mountains (Sharp 2019).

As noted above, the costs of repairing water and broader utility infrastructure are high, and so are the costs of repairing or replacing private water infrastructure up to code. Homes with damaged or destroyed septic systems face high costs of permits and construction and inspections. For households not attached to sewer lines, the cost of restoring a septic system can reach $8,000 (Hanson 2020).

▶ Recommendations

» Continue to refine (re)building and infrastructure regulations to allow for three-fold objectives of fire protection, affordability and flexibility in compliance.

» Ensure that efforts to support displaced households to find emergency and temporary housing are coordinated with efforts to provide sufficient water supply.

» Consider ways to make existing funding mechanisms more accessible to displaced households, including specificity of targeting of different types of housing assistance to different displaced populations.

» Conduct more research on reducing infrastructure costs of buildback.

» Ensure water safety communications and alerts are proactively translated into locally accessible languages beyond English and Spanish.

» Develop a suite of "Code+" housing code recommendations to support housing density while ensuring future fire safety for communities.

4. END-USE WATER QUALITY AND PUBLIC HEALTH IMPACTS AFTER FIRE

Restoring the quality of and public trust in tap water after a fire is a critical step in community recovery. Wildfire can damage water quality at the source and within the water system (Solomon et al. 2021). Burned areas deliver higher levels of sediment and contaminant loads to water sources and reservoirs. Fires can damage or destroy water system, private well, and household plumbing infrastructure, introduce contaminants or aesthetic impairments to the water supply, and each has differently responsible parties. Moreover, displaced families need interim water and attention must be paid to ensuring they can trust the water in their homes when they are able to return.

As noted above, water quality impacts from wildfire occur at multiple points along the water delivery system. A wildfire can damage water quality at the source. Burned areas deliver higher levels of sediment and contaminant loads to water sources and reservoirs, which then require extensive treatment to meet potability standards. Of increasing concern is the damage or destruction of near or at point-of-use, publicly-regulated water system infrastructure, as well as private well and household plumbing infrastructure. In non-emergency situations, the maintenance of private well and household plumbing infrastructure is the responsibility of property owners, not water systems or regulators (for instance, see Pierce et al. 2019), but that model has proved wholly inadequate in emergency situations such as fire damage to plumbing systems. These point-of-use impacts range from emerging, volatile contaminants of immediate health concern to aesthetic impairments. Moreover, households displaced by fires or who have contaminated in-home supplies need high quality interim water and attention to ensuring they can trust and use the water in their homes when they are able to return or have their contamination issue remediated.

▶ Are new or enhanced drinking water regulations for testing and treatment needed to better address near or at point-of-use drinking water quality impacts from wildfire?

Water runoff from areas burned by wildfires carries elevated levels of contaminants, precursors to disinfectant byproducts, and sediments into drinking water systems and private well supplies. These upstream contaminants may require additional treatment technologies to meet federal and state safe drinking water standards (Uzun et al. 2020). Wildfires can also introduce dangerous levels of contaminants throughout the water distribution system or from impacts to premise plumbing.

Burned or melted water infrastructure—particularly those components made from cross-linked polyethylene (PEX) or polyvinyl chloride (PVC), including some storage tanks, distribution pipes, meters, and domestic well infrastructure—can release dangerous levels of volatile organic compounds, like benzene, into drinking water supplies. Moreover, this damaged infrastructure can cause water pipes to depressurize and introduce bacteria or spread volatile organic compounds (VOCs) from damaged parts of the network to undamaged areas. These VOCs may linger in the distribution and premise infrastructure for extended periods of time (Proctor et al. 2020). The question of where water suppliers and households can effectively use point-of-use treatment technologies in post-fire contexts, among other emergency situations requires extensive clarification from regulators (Hacker and Binz 2021).

▶ Who should provide emergency water supply, and what scale is feasible given the cost?

After a wildfire, residents may need emergency drinking water supplies for a period of days to months following displacement from their homes in an evacuation, if fire damage has contaminated the water supply or the distribution system, or if a water system is damaged and inoperable. The primary interim emergency water provided by state and federal agencies to families in need in California is bottled water.

State and Federal emergency planning guidelines list bottled water as an emergency water source when traditional supplies are unsafe (US EPA 2011). The California Office of Emergency Services Emergency Drinking Water Procurement & Distribution Planning Guidance contains a standing contract that local governments may use to purchase emergency bottled water supplies (Cal OES 2014). Further, authorized by water code section 13442, the California State Water Resources Control Board may use the California Cleanup and Abatement (CAA) account to address drinking water needs in emergency situations. During the 2012–2016 drought, the majority of funding distributed by the CAA for emergency interim water supplies was spent on providing bottled water to county and local governments or water systems for distribution to households (UDWN).

Despite the widespread use of bottled water as an emergency drinking water source, the State government has not been able to take advantage of any economies of scale to reduce the cost of bottled water, purchasing bottled water at market rates from local retail establishments. Bottled water retail costs are up to 156 times the cost of tap water and leave local governments and residents vulnerable to local retail supply. The State Water System Needs Assessment found the cost of providing only 60 gallons per month per connection (far below the State goal of 55 gallons per person per day) in systems on the State's Human Right to Water List would reach $1 billion annually (Water Boards 2021).

An alternative emergency water supply delivery mechanism for communities and water systems affected by wildfire is hauled water to communal supply points. Based on internal UCLA Luskin Center for Innovation research of projects authorized by CAA funds, hauled water might be less expensive to provide than bottled water, with a cost of $0.10–$0.25 per gallon at the allocation of 60 gallons per month. Further cost reductions are possible if a community filling station model, that reduces the cost and frequency of deliveries, is used. However, there has been no analysis of the water hauling industry's timing, capacity and reach in the context of emergencies.

Even more promisingly in terms of sustainable or diversified on-call water supply, water systems with sources that are reliable and safe from fire could be designated regionally as emergency water providers on call to disperse water to be hauled outside of their boundaries in emergency situations. This would require further coordination between LAFCOs, some of which believe they have jurisdiction to grant access for water to move across place of use boundaries in emergency situations, and the State Water Board.

▶ How can we improve post-fire response guidance and testing support to improve communities' trust in water quality?

As households in California recover from wildfire events, return home, and come together to rebuild communities, their trust in the safety of their drinking water often wanes (Odimayoni et al. 2021). As the presence of benzene and other VOCs in drinking water becomes apparent, and as water systems work to determine how

widespread the contamination was, residents have at times received changing warnings and boil advisories and shifting recommendations on point-of-use or point-of-entry filtration from local officials.

Unclear communication from state and local officials on what type of at-home filter is appropriate in each circumstance have been made worse by insurance policies that reportedly cover the costs of filters that may not adequately address VOCs found in drinking water (Olsen 2020). Mixed messaging from local or state officials can decrease trust in the safety of drinking water and increased reliance on more expensive bottled water for drinking, cooking, bathing, and brushing teeth, which in turn greatly impairs the quantity of water consumed and imposes its own environmental impact (Wang et al. 2019). One resident, frustrated after the CZU Complex Fire, was quoted saying, "If the water is messed up, we understand. We had a catastrophic fire up here, we understand that. But just let us know why" (Becker 2020). There is also a question of whether employing better public communication or science outreach can solve the issue (Roy and Edwards 2019), or if broader distrust must be addressed. In response to VOC post-fire contamination, the US EPA has released guidance for water systems to use when identifying and treating VOC in water supply, including guidance on communication with the public (US EPA 2021).

Some residents interviewed turned to private testing labs after purchasing at-home water quality test kits out of pocket. It is unclear whether the state or counties can muster sufficient responses to resident concerns and information gaps in these contexts, or whether new resources need to be made available to public agencies. Given widespread distrust in the government, especially in rural areas often affected by wildfire, a more effective alternative may be supporting the expansion of the capacity of researchers, non-profit organizations and community-based organizations to provide information, technical assistance with testing, and an appropriate return to trust in a disaster recovery context. Resources and sustained assistance efforts to fire-affected communities, such as those carried out by the Purdue Center for Plumbing Safety, can serve as a model for future non-governmental efforts (PCPS 2021). For instance, in some other emergency contexts, public officials have only admitted water safety concerns related to tap water once external experts were engaged (Lambrinidou 2018).

▶ Recommendations

- Bring regulations and technology for point-of-use treatment more pointedly to be informative and deployable in post-wildfire contexts.
- Proactively fund and deploy emergency water supplies pre-wildfire event.
- Determine which stakeholders are best suited to communicate and what communication style and content helps different communities appropriately trust their water supply post-fire.
- Ensure water safety communications and alerts are translated into locally accessible languages.

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Citizen Water Quality Monitoring



Water quality monitoring is crucial to maintaining the health of habitat and water resources. This program identifies contaminant levels in the Arroyo Seco and sets the stage for corrective measures.

Arroyo Seco Foundation volunteers collect water samples from the stream and test the levels of a set of parameters, such as pH, dissolved oxygen, and bacteria. Anyone can participate! If you are interested, please let us know at info@arroyoseco.org.

The water quality data collected will:

- be used in the planning and evaluation of stream enhancement activities;
- promote understanding of the overall function of the Arroyo Seco stream;
- measure upstream-downstream, seasonal, year-to-year, and long-term changes in water quality and watershed conditions;
- detect point sources and non-point sources of pollution;
- educate the public about the stream and its riparian corridor; and
- develop a sense of community stewardship for the Arroyo Seco and its rich aquatic resources.

Seasonal monitoring is essential for an accurate assessment of the water quality of the Arroyo Seco because the ecological life of the watershed varies with the seasons. Changes in weather conditions have a great influence on water quality. Heavy rainstorms in the winter and early spring introduce large amounts of pollutants due to runoff. In the summer, reduced flows and higher temperatures caused by dry weather alter the conditions. Baseline monitoring data (chemical, physical, and biological) are necessary to identify vulnerable areas to be targeted for improvement.

Water quality in the Arroyo Seco Watershed is degraded in several significant ways. The Hahamongna Basin is a Superfund site due to the presence of volatile organic chemicals and perchlorate. Nitrates from past agricultural practices and septic tank systems are a significant factor in some parts of the watershed. Street runoff from throughout the watershed pollutes the Arroyo Seco stream with trash and contaminants, and the Los Angeles Regional Water Quality Control Board has detected unacceptable levels of coliform from animal waste.

For more information, see *Developing a Citizen Water Quality Monitoring Program in the Arroyo Seco*, a complete guidebook for water quality testing and improvement in the Arroyo Seco.

The Test Sites

Samples are collected from 11 locations along the main stem of the Arroyo Seco. These sites were established by the Los Angeles County Department of Public Works as being important for determining the condition of the stream in general. You can view a map of them here.

- **Confluence** — The site where the Arroyo Seco joins the Los Angeles River, near Downtown Los Angeles.
- **North Branch** — A major tributary that flows through Sycamore Grove Park in Northeast Los Angeles.

Documents for Volunteers

Site Conditions Form

Sample Bottle Labels

Arroyo Seco Water Quality Monitoring Handbook

Test Results

March 2013
ASF Report | PWP Report

- **Arroyo Seco Golf Course** — The base of the northern end of the Arroyo Seco bike trail.
- **San Rafael Creek** — The creek coming from Johnson Lake in Pasadena that enters the Arroyo just north of the South Pasadena city line.
- **BFI Lower Arroyo Park** — The low flow streams in Pasadena's Lower Arroyo.
- **Slime Slide** — The area under the Colorado Street Bridge where the concrete channel meet the natural soft bottom.
- **Seco Street** — The storm drain system that drains much of Northwest Pasadena and enters the Arroyo near Brookside Park, just south of the Rose Bowl.
- **Flint Canyon** — The Arroyo tributary that drains La Cañada Flintridge and meets the Arroyo northwest of Devil's Gate Dam in Hahamongna Watershed Park.
- **Altadena Drain** — The storm drain outlet from Altadena near the top of the Hahamongna Basin.
- **Millard Canyon** — The first major interface between natural and urbanized parts of the watershed.
- **El Prieto** — The canyon near the Forest Service's homes above the Hahamongna Basin. This is the most natural site we test at.

Water Quality Paramenters

The presence of certain substances in water indicate conditions that are harmful to individual organisms and a balanced ecosystem. The parameters ASF tests include:

- total coliform bacteria
- E. coli
- dissolved oxygen
- total dissolved solids
- nitrogen
- pH
- temperature
- turbidity

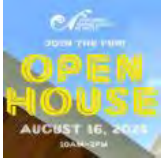
For more information on these parameters and why they are important, see our water quality parameters page.

Arroyo Seco Foundation, 570 W. Avenue 26 #450, Los Angeles, CA 90065-1011
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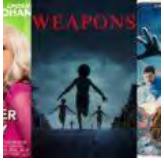

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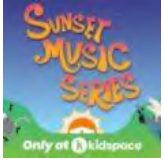


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Debris removal not yet complete?



Altadena Residents Express Concerns Over Noise, Air Quality Amid Eaton Fire Cleanup Efforts

BY ANDRÈ COLEMAN, MANAGING EDITOR

Published on Thursday, March 27, 2025 | 3:57 pm



Residents of Altadena near the Altadena Golf Course are raising concerns over noise and air quality as crews work to clean up properties damaged by the Eaton Fire.

The U.S. Army Corps of Engineers is set to begin crushing concrete and recycling metal on the golf course starting next week.

The fire, which started in Eaton Canyon on Jan. 7 led to 17 deaths, destroyed 9,000 structures and scorched 14,000 acres, left tons of debris in Altadena and forced the Corps to find a location to move the devastation as it clears local properties.



[https://foundationdentalspecialists.com/]

Homeowners whose properties are still standing are worried, and have expressed concerns over the potential hazards posed by the cleanup operations.

The Army Corps maintains that the operation will be safe, despite its proximity to residential areas. Officials say air quality will be closely monitored, and the noise level will be kept to a minimum, comparable to the sound of “loud traffic” or around 80-90 decibels.

“Our air monitors are actually equipped with a special silica monitor so that we’ll be able to track that very closely,” said Col. Sonny Avichal with the Army Corps of Engineers. The results



[https://simplydivine1.com/]

from these air monitors will be shared with the state's air resources board and the South Coast Air Quality Management District (AQMD), which will make the findings public.

In an effort to reduce dust, misting stations will also be deployed at the site. Avichal emphasized that the cleanup process is designed to be efficient, fast, and safe for the surrounding community.

The golf course, which is leased to the Army Corps from the County for the next 10 months, will operate from 7 a.m. to 7 p.m.



[https://www.pfcu.org/loans/home-equity-loans-and-lines]

One of the main concerns is the presence of silica, a toxic compound released during the cutting and drilling of concrete.

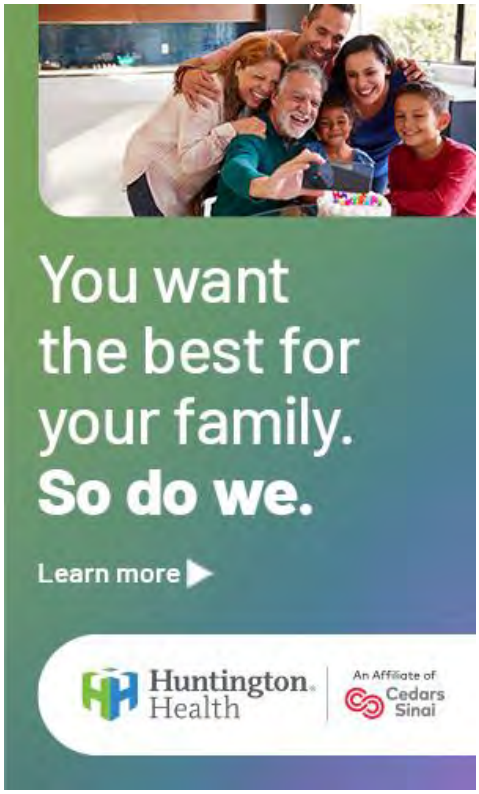
"It's about math, efficiency, and speed," Avichal told NBC news. "And, of course, we're going to do everything safely."

Army Corps officials say that relocating the operation is not feasible.



[https://www.lafirejustice.com/?utm_source=google&utm_medium=search&utm_campaign=012125_PTV_LAFJ&gad_source=1&gclid=Cj0KCQiAhvK8BhDfARIsABsPy4g5cfjMV5WLCN9Pv6p_5RK9wtXRV5NDt-_FqUvQP10AAHw5EC-PkaEaAlZeEALw_wcB]

“Right now, it takes a dump truck about an hour to go to a permanent landfill each way, and that doesn’t even include LA traffic,” said Avichal. “What this will do is increase turnaround times, so we don’t have to add more trucks into the system.”



[https://www.huntingtonhealth.org/huntington-health-physicians/]

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YSABEL JURADO
L.A. CITY COUNCIL MEMBER
DISTRICT 14

Dear Christina Monde:

Thank you for the opportunity to comment on the Arroyo Seco Water Reuse Project. While the City of Pasadena is the lead agency, the project spans parcels across three cities: Pasadena, South Pasadena, and Los Angeles. As currently designed, the project proposes changes to a parcel owned by the City of Los Angeles, an area deeply valued by the Highland Park community. I write to ensure Los Angeles residents have a seat at the table as this project moves forward.

We have identified several key concerns related to the project's environmental impact. Given the interconnected nature of our communities at this location, we urge that our comments be considered in relation to the entire project area, not just the portion within Los Angeles city limits.

Biological Resources
According to the 2023 Mitigated Negative Declaration (MND), the project would result in the removal of 136 mature trees, 36 of which are protected by municipal ordinances. Removing these mature trees should be documented, and appropriate mitigation measures identified and applied according to the City of Los Angeles Protected Tree Ordinance and other regulatory requirements. Additionally, according to the *Response to Comments, Clarifications, and Mitigation Monitoring and Reporting Program* published in 2024, the trees on the Los Angeles Parcel of Land will be replaced by 15-gallon specimens. Therefore, this section of the report should accurately reflect the impact over time, as the new trees will take decades to grow a comparable canopy to the existing ones.

The report should also analyze the full range of impacts associated with the loss of mature tree canopy, including increased temperatures, reduced air quality, elevated noise levels, and heightened light pollution. These effects will significantly affect the quality of life in surrounding communities, regardless of jurisdiction.

In addition, must examine potential habitat loss for wildlife during both the construction phase and the long period it will take for vegetation to regrow. Any presence of endangered or protected species should be identified, with corresponding mitigation strategies implemented per the California Environmental Quality Act (CEQA).

Water Use
According to the previously submitted MND, South Pasadena's Arroyo Seco Golf Course has rights to the dry-weather flows from the Arroyo Seco for irrigation, though these rights have not been exercised in recent decades, contributing to infrastructure deterioration that this project aims to address. Upon completion, the project proposes to capture both dry and wet weather flows for irrigation use.

Since these flows have not been historically utilized, the EIR must assess the potential impacts this change may have on the broader Arroyo Seco watershed. The report should also evaluate how changes to hydrology could affect the area, especially during drought conditions, and consider how climate change may exacerbate these impacts.

Importantly, this project should align with Los Angeles Green New Deal goals, which include sourcing 70% of the city's water locally to improve climate resilience. This alignment is essential.

Communication
The Arroyo Seco Water Reuse encompasses land across three jurisdictions, including a parcel owned and managed by the City of Los Angeles Department of Recreation and Parks. Los Angeles must be treated as a full partner, not a junior stakeholder.

Multiple City of Los Angeles departments have an interest in any changes to this site, including the Department of Water and Power (LADWP), the Bureau of Sanitation (LASAN), the Fire Department, the Bureau of Engineering, and the Department of City Planning. Pasadena and South Pasadena must coordinate directly with all relevant departments, as well as with Council District 14.

Meaningful communication with Los Angeles residents, particularly those in Highland Park, is also critical. Outreach efforts should include community meetings, presentations, and flyers, provided in both English and Spanish to ensure equitable access to information.

Alternatives
This project was initially planned with little to no input from the City of Los Angeles. The Department of Recreation and Parks was only approached after much of the design had already been completed. As alternatives are evaluated in the EIR, Los Angeles stakeholders must be involved from the beginning.

Our city departments and community members are eager to collaborate on a project that delivers shared benefits. As planning continues, it is imperative that all three cities work together to ensure stakeholders are informed and given a genuine opportunity to provide input.

Sincerely,



Councilmember Ysabel Jurado
Los Angeles City Council District 14

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
( ) The loss of a local cherished community parkland including the loss of access to the water.
( ) Removal of a water source that is currently supporting local wildlife.
( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.
( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
( ) An alternative that seeks input from community members and takes this information into consideration.
( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(X) Additional comments:

Name: Katie Herrera Email Address:

Address:

Signature: Date: 06/11/23

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Monica Kelly
Sent: Sunday, June 29, 2025 1:44 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project (Water Reuse Project)

I am urging the EIR for the Water Reuse Project not be focused on only the plan that has been proposed. The EIR for the Water Reuse Project should also consider ways in which more natural methods of water filtration and native habitat development can be incorporated. From my volunteer work in the Arroyo I see the excitement of children discovering life (plants, bugs, ect.) that they never see in manicured parks. Access to wild space (with existing native plants and trees preserved) is needed to expand an appreciation of nature. A wild water element is sorely absent and would not be addressed by the current plan. I urge you to consider how to remedy this within the scope of the project EIR.

Monica Kelly
South Pasadena

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Kenneth A Fong Email Address: _____

Address: _____

Signature: _____ Date: _____

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Wendy Kerfoot
Sent: Monday, June 30, 2025 3:10 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Cc:
Subject: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project

Dear Ms. Monde,

I respectfully submit these scoping comments for the Environmental Impact Report (EIR) for the proposed Arroyo Seco Water Reuse Project. Given the project's potential for significant environmental impacts, I request that the EIR provide comprehensive analysis of the following critical issues to ensure full compliance with CEQA.

Key Areas Requiring Thorough Environmental Analysis

1. **Project Alternatives Analysis**: The EIR must evaluate nature-based solutions (bioswales, infiltration basins, and the like), upstream pollution control measures, phased restoration approaches, and a comprehensive no-project alternative that could achieve water quality goals with reduced environmental impacts.

2. **Biological Resources Impact Analysis**: The EIR must include complete biological surveys documenting existing riparian ecosystem functions, wildlife usage patterns, and cumulative habitat loss analysis. Specific assessment of impacts of removing 142 trees (including 42 protected trees) out of a total of 195 counted trees for both sites, and realistic timelines for replacement habitat functionality are essential. (Draft MND, Table 3). Include alternative projects that maintain the existing native trees and shrubs.

3. Hydrology, Water Quality and Water Rights: The EIR must provide current water quality data, detailed TMDL compliance modeling, downstream flow impact assessment, and analysis of the legal authority to divert 535 acre-feet of water, with 62 acre-feet guaranteed to the City of South Pasadena to irrigate its golf course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Climate change resilience analysis is also required.

4. Long-term Operations and Maintenance: Given the complexity of proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity, life-cycle costs, and performance monitoring protocols.

5. Construction Impacts: The estimated 17-month construction period requires detailed analysis of air quality, noise, traffic, and recreational impacts affecting multiple jurisdictions and park users. Consider projects that will accomplish the water quality goals with less construction-generated pollution.

6. Regional Coordination and Cumulative Impacts: Include projects that fit with 20+ years of Arroyo restoration plans and other watershed projects. The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco.

7. Tribal Consultation: Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

Essential Requirements

The EIR must establish comprehensive baseline conditions through current biological surveys, recent water quality data, and existing recreational usage patterns. All significant impacts require specific, enforceable mitigation measures with performance standards and long-term funding mechanisms.

This project will eliminate an entire functioning riparian ecosystem and requires thorough environmental analysis to ensure decision-makers and the public have complete information about environmental consequences and alternatives that could meet project objectives with reduced impacts.

Thank you for considering these comments in the EIR scope of work.

Contact Information:
Wendy Kerfoot

From: Sam Kirkeby
Sent: Monday, June 30, 2025 1:03 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Urgent: Oppose Arroyo Seco Water Reuse Project - Please help save our precious riding & walking corridors & trees

Subject: Urgent: Oppose Arroyo Seco Water Reuse Project – Protect Historic Equestrian & Multi-Use Corridors

Dear Ms. Monde and Members of the City of Pasadena Department of Public Works,

On behalf of the Los Angeles Equestrian Coalition, I submit this comment urging the City of Pasadena to halt the Arroyo Seco Water Reuse Project in its current form.

This project poses an unacceptable threat to one of Southern California's last historic multi-use and equestrian corridors — a route with deep roots stretching from Indigenous stewardship by the Kizh Nation to Rancho land grant horse transit and explicitly recognized in Los Angeles County's General Plans as protected equestrian infrastructure.

The proposal would remove over 140 mature trees, destabilize soils, increase dust and erosion, and narrow or obstruct trail alignments that have served riders, hikers, and the broader community for generations. Critically, it fails to uphold the Los Angeles County Trails Manual (2003) and the California State Parks Trail Handbook (2007), which require:

- *8–12 foot tread widths and 10 foot vertical clearances for safe multi-use and equestrian passage,*
- *Preservation of native canopy and natural surfaces essential for horse hoof safety,*
- *And avoidance of impacts to culturally significant lands and corridors.*

Furthermore, the plan diverts approximately 175 million gallons annually from the Arroyo Seco — largely to irrigate a South Pasadena golf course — fundamentally altering riparian conditions and further threatening trail stability and safety.

These corridors are not just recreational amenities. They are vital, historic pathways of cultural mobility and multi-generational equestrian tradition, sustaining working-class and Latino communities who maintain charro and vaquero practices. Disrupting them violates principles of mobility justice and erases irreplaceable cultural infrastructure.

We strongly urge the City of Pasadena to:

- *Reject or substantially redesign this project to protect these trails,*
- *Guarantee compliance with County and State trail standards,*
- *Implement binding protections for safe equestrian access before, during, and after any work,*

Engage the Kizh Nation as rightful stewards in any decision-making impacting their ancestral lands,

And pursue alternative stormwater strategies that preserve these irreplaceable corridors.

Thank you for considering this critical matter and for upholding the cultural, environmental, and mobility legacies entrusted to your stewardship.

Sincerely,

Samantha C Kirkeby

Local Equestrian - Los Angeles native

June 30, 2025

Christina Monde
City of Pasadena
Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101

Dear Ms. Monde:

On May 15, 2025, the City of Pasadena, as designated lead agency, issued the Notice of Preparation of an Environmental Impact Report (EIR) for the Arroyo Seco Water Reuse Project (Project). The Project will involve the discharge of dredge and fill materials and thus will require a Clean Water Act section 401 Water Quality Certification. Our comments are submitted in compliance with California Environmental Quality Act (CEQA) Guidelines §15096(b), which, in relevant part, requires CEQA responsible agencies to specify the scope and content of the environmental information germane to their statutory responsibilities that the lead agency must include in the Environmental Impact Report (EIR).

The Cities of Pasadena and South Pasadena (collectively, "Cities") previously submitted an application for a Clean Water Act section 401 Water Quality Certification (File No. 24-138) for the Project. The application, and associated initial study/Mitigated Negative Declaration, was withdrawn by the Cities. The EIR will supersede the previously prepared Mitigated Negative Declaration.

The following are comments on the Notice of Preparation of the EIR by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board.)

Scope and Level of Needed Analyses

The EIR for this project should characterize all project-specific, cumulative, direct, and indirect impacts of this project on the quality of waters of the state and identify alternatives and other mitigation measures to reduce and eliminate such impacts. Analyses should include:

1. Identification of Affected Waters

A clear understanding of the location and nature of the waters potentially affected by this project is fundamental to fulfillment of our regulatory responsibilities. Please:

a. Provide regional-scale and 1:24,000-scale maps and a description of all waters, e.g., wetlands, riparian areas, streams, other surface waters, and groundwater basins.

b. For waterbodies expected to be directly affected, identify the acreage and, for drainage or shoreline features, the number of linear feet potentially impacted, and sum the total affected acres and linear feet by waterbody type.

2. Avoidance and Minimization Analysis

The Los Angles Water Board strongly encourages avoidance as the primary strategy to address water quality concerns. Please include in the EIR:

a. Measures to avoid or minimize each potential cause of water quality degradation.

b. An analysis of why any remaining impacts cannot be avoided or further minimized.

3. Analysis of Diversion of Flows

Please evaluate the impact of reduced flows on beneficial uses of the Arroyo Seco and San Rafael Creek downstream of the diversion when evaluating the Project.

Please coordinate with the State Water Resources Control Board, Division of Water Rights on any evaluation of the need for a Water Right pursuant to Water Code section 5101 for the diversion of surface waters contemplated under this project.

Outreach

Based on the project description in the Notice of Preparation, the project scope has not changed from the previously submitted application (File No. 24-138) and will encompass 2.2 acres in the City of South Pasadena and the City of Los Angeles at the San Pascual site. It is our understanding that the City of Los Angeles staff was not previously aware of the Project nor did they provide comment on the prior Mitigated Negative Declaration. Please ensure that the City of Los Angeles is engaged in the development of the EIR for the Project. In addition, nearby residents within the City of Los Angeles also previously voiced concerns that they were not appropriately notified of the project or received outreach to provide comment regarding the prior CEQA documents. Please provide adequate outreach to the community and tribes within the vicinity of the Project.

Thank you for considering our comments on the scope and content of the EIR for the Project. If you have any questions, please contact Man Voong at man.voong@waterboards.ca.gov.

Sincerely,

for Susana Arredondo
Executive Officer
Los Angeles Regional Water Quality Control Board

From: Casey Law
Sent: Saturday, May 24, 2025 2:49 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Comment on Arroyo Seco Canyon Project

To Christina Monde, City of Pasadena Department of Public Works,
I am a resident of South Pasadena and a commissioner on the Natural Resources and Environment Commission. Our commission has been updated on the plans for the Arroyo Seco Water Reuse Project.
I wanted to write to declare my support to the project as presented. The challenge of managing urban runoff and water usage is big, so it motivates a big project. This will pay huge dividends for the region if implemented and maintained well.
The Arroyo Seco Water Reuse Project represents a vital investment in long-term water sustainability. By constructing two infiltration basins and implementing advanced storm drain runoff cleaning before it reaches the ocean, the project directly addresses critical water quality concerns. Furthermore, the reuse of cleaned and captured water to irrigate the South Pasadena golf course will significantly reduce the demand for potable water, freeing up valuable resources for other essential uses.

The creation of two native gardens with educational signage will serve as valuable learning resources, deepening public understanding of watershed ecology. It will be important to maintain this new landscape well and I hope that South Pasadena will commit to doing so in a way that matches the vision presented in the current plan.

The Arroyo Seco Water Reuse Project is a testament to our community's commitment to a sustainable future and the vision of Measure W. The Arroyo Seco Water Reuse Project stands as a model for inter-agency cooperation and responsible resource management, promising a healthier, more beautiful, and water-secure future for the region.

Some residents of Los Angeles have led a misinformation campaign that has cast South Pasadena as a sort of villain that is taking a public resource for its golf course (among other falsehoods). I hope that leaders in Pasadena and South Pasadena can listen and respond to substantive comments from the community, not misinformation and fear.

Respectfully,

Casey Law

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
( ) The loss of a local cherished community parkland including the loss of access to the water.
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( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.
( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
( ) An alternative that seeks input from community members and takes this information into consideration.
( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: THOMAS LEE Email Address: _____

Address: _____

Signature: _____ Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Laura Montoya Email Address:

Address:

Signature: Date: 6/14/24

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: J L
Sent: Wednesday, May 28, 2025 10:13 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Support email for Arroyo Seco Water Reuse Project

Hi Christina,
I am writing to express my strong support for the Arroyo Seco Water Reuse Project. This forward-thinking initiative represents exactly the kind of innovative water management and habitat restoration our region desperately needs.

We've destroyed enough of our environment; this project shows what can be done to restore it. Only a lawyer looking to profit would oppose such project.

Thank you for doing such a valuable project for California.

Thanks,
Jeff Leon
from South Pasadena

From: Elaine Fassel
Sent: Sunday, June 29, 2025 11:12 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Reuse Project

June 29, 2025

Christina Monde, P.E.

City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

Re: Arroyo Seco Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

I'm writing about the environmental study for the proposed *Arroyo Seco Water Reuse Project*. This project could seriously harm the environment, so the study needs to look closely at the following important issues.

Better Alternatives Study natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site to allow for less destructive ways to stop pollution upstream. Also, look at doing nothing and still meeting clean water goals by stopping pollution at the source.

Wildlife and Trees This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually work. We would like to see alternatives that maintain the existing native trees and shrubs.

Water Rights and Quality Show current water pollution levels, prove the cleanup will work, study how taking 535 acre-feet of water affects downstream areas, and confirm the cities have legal rights to take this water. Show that the City of South Pasadena has the legal water rights to take 62 acre-feet of Arroyo Seco water for irrigation of the Arroyo Seco Golf Course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Also study how climate change affects everything.

Long-term Costs and Care This is complex infrastructure. Study who will maintain it, how much it will cost over time, and how we'll know if it's working.

Construction Problems The estimated 17 months of construction, as noted in the MND, will create air pollution, noise, and disrupt park users. Look for projects that will accomplish the water quality goals with less construction-generated pollution.

Regional Planning The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. Include projects that fit with over 20 years of Arroyo restoration plans and other watershed projects, as well as the recent Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024.

Why This Matters

This project will destroy a natural stream ecosystem that, while impacted by weeds, still provides important habitat right now. The environmental study must show exactly what exists today and require specific, enforceable fixes with clear standards and guaranteed long-term funding.

The public and decision-makers need complete, honest information about what this project will destroy and whether there are better ways to clean the water that don't cause so much environmental damage.

Thank you for considering these comments in the EIR scope of work.

Yours, Elaine Livesey-Fassel , L.A.California

From: < @earthlink.com>
Sent: Wednesday, June 25, 2025 11:14 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: ENVIRONMENTAL STUDY OF WATER RESTORATION PROJECT

We, the Lomas family, live at : a couple of blocks from the Arroyo near the San Rafael Bridge. The Lomas family has owned this home for close to seventy-five years. We have a strong interest in any improvements that will lead to an even more natural and beautiful Arroyo. We remain forever hopeful that any serious project will include removal of the concrete.

We just learned about the Water Restoration Project. We request that the Project be fully presented to the public and include various perspectives. Although we agree with the obviousness need to address water shortages, we also want any work to improve the natural health and beauty of the Arroyo.

We are requesting that the Environment Impact Study address the impact of the Project as currently designed on: the natural appearance of the Arroyo, the trees and other vegetation, the birds and fish, and the animals and the flow of the "river" through the Arroyo.

Please confirm receipt. Thank you.

June 29, 2025

Christina Monde, P.E.

City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

Re: Arroyo Seco Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

I'm writing about the environmental study for the proposed *Arroyo Seco Water Reuse Project*.

As a field Biologist and Administrator, I managed the Los Angeles County Natural Areas and Nature Centers, for 39 years with the County Department of Parks and Recreation. The Arroyo Seco has been my hiking area and natural history outdoor laboratory for over five decades and I feel a close attachment to the wild portions of the Arroyo. I still contribute photographs and identifications of birds, plants, insects, reptiles and amphibians in the Arroyo to citizen science projects, including iNaturalist and eBird.

The project proposed could seriously harm the environment, so the study needs to look closely at the following important issues.

***Wildlife and Trees*:** This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually become established. I would like to see alternatives that maintain the existing native trees and shrubs.

Natural Alternatives: Many cities and counties are now implementing water projects that restore natural flows, above ground, returning native vegetation and the hydrology that supports wildlife. The early days of pipes and concrete are fading away. Study natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site to allow for less destructive ways to stop pollution upstream. Also, look at doing nothing and still meeting clean water goals by stopping pollution at the source.

Long-term Costs and Care: This is complex infrastructure. We need to know who will maintain it, how much it will cost over time, and how we'll know if it's working

Regional Planning The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. Include projects that fit with over 20 years of Arroyo restoration plans and other watershed projects, as well as the recent Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024.

***To emphasize*:** This project will *destroy a **natural** stream ecosystem* that, while impacted by weeds, still provides important habitat right now. The environmental study must show exactly what exists today and requires specific, enforceable fixes with clear standards and guaranteed long-term funding.

The public and decision-makers need complete, honest information about what this project will destroy and whether there are better ways to clean the water that don't cause so much environmental damage.

Thank you for seriously considering these comments in the EIR scope of work.

Sincerely,

Michael Long

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Rob Lucero Email Address: _

Address:

Signature: [signature] Date: 5-24-25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Ka Hootu Muula
Sent: Monday, June 30, 2025 1:34 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

Dear Ms. Monde and Members of the City of Pasadena Department of Public Works,

On behalf of the Los Angeles Equestrian Coalition, I submit this comment urging the City of Pasadena to halt the Arroyo Seco Water Reuse Project in its current form.

This project poses an unacceptable threat to one of Southern California's last historic multi-use and equestrian corridors — a route with deep roots stretching from Indigenous stewardship by the Kizh Nation to Rancho land grant horse transit and explicitly recognized in Los Angeles County's General Plans as protected equestrian infrastructure.

The proposal would remove over 140 mature trees, destabilize soils, increase dust and erosion, and narrow or obstruct trail alignments that have served riders, hikers, and the broader community for generations. Critically, it fails to uphold the Los Angeles County Trails Manual (2003) and the California State Parks Trail Handbook (2007), which require:

8–12 foot tread widths and 10 foot vertical clearances for safe multi-use and equestrian passage,

Preservation of native canopy and natural surfaces essential for horse hoof safety,

And avoidance of impacts to culturally significant lands and corridors.

Furthermore, the plan diverts approximately 175 million gallons annually from the Arroyo Seco — largely to irrigate a South Pasadena golf course — fundamentally altering riparian conditions and further threatening trail stability and safety.

These corridors are not just recreational amenities. They are vital, historic pathways of cultural mobility and multi-generational equestrian tradition, sustaining working-class and Latino communities who maintain charro and vaquero practices. Disrupting them violates principles of mobility justice and erases irreplaceable cultural infrastructure.

We strongly urge the City of Pasadena to:

Reject or substantially redesign this project to protect these trails,

Guarantee compliance with County and State trail standards,

Implement binding protections for safe equestrian access before, during, and after any work,

Engage the Kizh Nation as rightful stewards in any decision-making impacting their ancestral lands, And pursue alternative stormwater strategies that preserve these irreplaceable corridors.

Thank you for considering this critical matter and for upholding the cultural, environmental, and mobility legacies entrusted to your stewardship.

--
Blessings,

Julian Angel Ibanez Mandujano - **(***Yoeme**/**Yaqui***)**

City of Pomona Parks and Recreation Commission - *Chairman*
Community Partners 4 Innovation (***Lopez Urban Farm***) - *Board Member/Farmer*
Indigeknowledge - *Executive Director*

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from: all

(√) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(√) The loss of a local cherished community parkland including the loss of access to the water.
(√) Removal of a water source that is currently supporting local wildlife.
(√) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(√) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(√) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(√) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(√) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(√) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(√) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.
(√) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(√) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(√) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(√) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(√) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(√) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(√) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(√) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
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(√) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(√) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(√) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(√) Additional comments:

Name: RICHARD MACIAS Email Address:

Address:

Signature: [signature] Date: 06/14/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: Laura Mason
Sent: Saturday, June 21, 2025 5:42 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Save San Pascual Park

Hello, Christina Monde,

I am writing as a resident of as a resident of Garvanza and Los Angeles, as well as a San Pascual Park user. I am asking that the Environmental Impact Report for the Arroyo Seco Water Reuse Project include the following:

Negative impacts resulting from....
1. The removal of over 140 mature trees and bushes, and their replacement with small saplings.
2. Removing 175 Million gallons of water from the Arroyo Seco annually, with only 40% of it being returned to the river.
3. The loss of Los Angeles parkland to local residents currently used and enjoyed by all. How can you think of taking this away from us, in a car-dominated society?
4. Removal of water source-supporting local wildlife.
5. Loss of a local riparian ecosystem habitat, and an important wildlife corridor connecting to the San Gabriel Mountains
6. Loss of birds and animals whose habitat will be lost for more than 2 years, the sounds of birds chirping in this area is lovely, and there are so many animals over here.
7. Noise pollution from loss of all the trees
8. Light pollution - Mature trees shield the community at night from the sports field lights and from vehicle headlights, and there is already SO much light pollution from the golf course/surrounding areas to Garvanza at night.
9. Air pollution. The air over here is already pretty bad, and the loss of trees will make it worse. **Show clear data.**
10. Heat islands that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Additionally, detail the water loss in the wetlands due to evaporation throughout the year. We are already in a drought and can't afford more heat and water loss.
11. Water capture at the site will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:
12. Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
13. Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity and wildlife habitat preservation and the re-introduction of Steelhead Trout. LA County pledged 5 million to consider stream restoration. Would the proposed project prevent stream

restoration in this portion of the Arroyo?
14. EIR must address the issue of cleaning the pollution at the source. The proposed cleanup at San Pascual will not address the pollution going into the river from known sources. Project proposed will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river.
15. Exploration of alternative areas that do not require the destruction of the current ecosystem.
16. Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include current contamination data from above the San Rafael project area to the South Pasadena Golf Course, and downstream from it.
17. Clear and transparent data showing how much water is diverted to the Golf Course, infiltration, irrigation, or wetland support, and how it shifts during each season or during times of drought.
18. Details on how the area will be maintained by Pasadena/South Pasadena in perpetuity. Address the impacts during the 30-year proposed maintenance schedule. Provide scope of responsibility after 30 years. Provide legal information on whether granting land in perpetuity violates the LA Charter 594c.
19. An alternative that seeks input from community members and takes this information into consideration.
20. Alternatives to the project, including a “no-build” option that assesses the impact of that option.
21. What are the benefits to LA City residents? What water will LA City receive? How much will the South Pasadena Golf Course pay for the water they will receive in perpetuity? Why does the golf course have more rights than local residents do? If LA Recreation and Parks receive any money will it be in perpetuity?
22. A detailed biological survey that observes all wildlife using the area, done during multiple visits, assessing the impact this project will have on them.
23. A detailed study of the archeological impact that this project could have, both of tribal artifacts, human burials, and fossilized species. Will construction continue if archeological items are found? Who will be monitoring this?
24. Provide proof of State Water Rights to divert water from the Arroyo Seco tributary to South Pasadena land.

Thank you,

Laura Mason

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
( ) The loss of a local cherished community parkland including the loss of access to the water.
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( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
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( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

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( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Paul McDermott Email Address:

Address:

Signature: Paul McDermott Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: T Louise
Sent: Thursday, June 19, 2025 3:48 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: EIR - Arroyo Seco Water Reuse Project

Hello,

As a resident of South Pasadena, I submit the following areas I would like to see studied in the EIR for the Arroyo Seco Water Reuse Project:

1. Bird Habitat and Nesting Site Impacts: The EIR should include a detailed avial survey with special attention to migratory and nesting species. Potential disruptions from vegetation removal, lighting, and construction activity should be analyzed.

2. Contaminants from Golf Course Runoff: Please analyze chemical runoff from the golf course - in particular pesticides, fertilizers and herbicides. What risk do they pose to wildlife and downstream groundwater?

3. Vegetation Removal, Scraping Away the Top Layer of Soil and Biodiversity Effects:
What impact will this have on the attempt to reestablish native species in a healthy habitat and ecosystem? What impact will this have on wildlife?

4. Impact on Neighboring Residents (Noise, Dust and Light Pollution): The EIR should study short and long term effects on nearby neighborhoods, including air quality degradation from construction dust, increased noise levels, and nighttime lighting that may disrupt both residents and wildlife.

5. Long Term Maintenance: Who will be responsible for maintenance, including water quality monitoring, maintaining the new plantings being proposed, maintaining the trails, weeding, pruning, trimming etc. I am a volunteer for Friends of the SP Nature Park and I know how much work is involved. Who will be responsible to do this? How much will it cost?

6. What are natural NO BUILD alternatives to this proposal?

7. What is the primary source of the pollution/ bacterial contamination in the Arroyo Seco? HOw can that be addressed at the source?

Sincerely,

Tarrie Mercer

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
( ) The loss of a local cherished community parkland including the loss of access to the water.
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( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
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( ) Additional comments:

Name: Annmarie Monroe Email Address:

Address:

Signature: Annmarie Monroe Date: 5-23-25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

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(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(✓) Additional comments:

Name: Vincent Montalvo Email Address

Address:

Signature: [signature] Date: 6/14/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Formal Comment Letter Regarding Natural Resources Concerns

Monday, June 30, 2025

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101

Subject: Formal Comment on the Proposed Arroyo Seco Water Reuse Project

Dear Ms. Monde,

On behalf of the Gabrieleño Band of Mission Indians – Kizh Nation, this letter serves as a formal opposition to the Arroyo Seco Water Reuse Project as currently proposed. We are particularly concerned about the potential impacts to protected Tribal natural resources within and adjacent to the project sites in the Lower Arroyo Seco.

While the project is presented as delivering environmental and water quality benefits, we understand that approximately 12% of the captured water will be diverted to irrigate the Arroyo Seco Golf Course. This allocation undermines the project's stated goals of groundwater recharge and habitat restoration. The protection and preservation of Tribal natural resources must remain central to this project's implementation.

Recommendations for Draft EIR Review

1. Impacts on Protected Natural Resources

Biological and Habitat Concerns
The Arroyo Seco supports a variety of sensitive and protected species, including the southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), coast horned lizard (*Phrynosoma blainvillii*), and western mastiff bat (*Eumops perotis californicus*). These species are listed or considered for listing by the California Department of Fish and Wildlife and are key indicators of ecosystem health.

Additionally, the area contains culturally significant plant species such as mugwort (*Artemisia douglasiana*) and western sycamore (*Platanus racemosa*), which hold sacred value to the Kizh Nation. The construction of stormwater capture and treatment facilities risks disrupting these habitats.

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, Secretary
Mike Jesus Lemos, Treasurer I | Samantha Lemos, Treasurer II | Richard Gradias, Chairman of the council of Elders
PO Box 393 Covina, CA 91723 www.gabrielenoindians.org
admin@gabrielenoindians.org

While native landscaping is proposed, its compatibility with existing in-stream resources must be carefully assessed. Pre-construction biological surveys, habitat restoration planning, and adaptive management practices should be implemented to mitigate these impacts and inform the environmental review process.

Hydrological and Water Quality Impacts

We support the goal of improving water quality and enhancing groundwater recharge. However, diverting and treating stormwater has the potential to alter natural hydrological patterns, disrupt sediment transport, and impact groundwater connectivity—especially during seasonal fluctuations. These alterations must be thoroughly studied and mitigated to avoid long-term ecological damage.

The Draft EIR should address the cumulative impacts of habitat fragmentation, noise, and hydrological changes in this already urbanized and ecologically fragile corridor.

Recommendations for the EIR

- Conduct comprehensive biological surveys to identify sensitive species and culturally significant plants and implement corresponding mitigation measures.
- Design stormwater facilities that mimic natural hydrology and minimize disruption to existing sediment dynamics.
- Ensure trail and hardscape features reflect the natural character of the Arroyo Seco and are ecologically sensitive.
- Establish a robust public engagement process to educate stakeholders and foster transparency.
- Monitor ecological and hydrological conditions throughout construction and post-construction to detect and address any emerging impacts.

The Arroyo Seco Water Reuse Project has the potential to set a precedent for sustainable development in the Upper Los Angeles River Watershed. However, such progress must not come at the cost of Tribal cultural and ecological integrity. We urge the City of Pasadena to implement the above recommendations and center the protection of natural and cultural resources in all planning and mitigation efforts.

Thank you for your time and consideration. I remain available for continued consultation and to provide further clarification as needed.

Respectfully,

Ricardo Montijo, MSc.
Montijo.ricardo.p@gmail.com
(626) 318-1274

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, Secretary
Mike Jesus Lemos, Treasurer I | Samantha Lemos, Treasurer II | Richard Gradias, Chairman of the council of Elders
PO Box 393 Covina, CA 91723 www.gabrielenoindians.org
admin@gabrielenoindians.org

From: Patricia Morton
Sent: Monday, June 23, 2025 2:15 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: EIR Scoping Comments

Dear Ms. Monde,

I write regarding the proposed Arroyo Seco Water Reuse Program plans and would like to make a comment for the environmental impact report.
Having reviewed the site plans, I believe this plan will further degrade the Arroyo Seco and set back efforts to restore its natural character. Water reclamation is a worthy goal, but this project will destroy wetland habitat, and will create an artificial and unsustainable project that will require substantial maintenance funding.
I urge you to develop a different program that will respect nature and improve conditions for fish, birds, wildlife, habitat, and people, in other words, a natural Arroyo Seco.

Sincerely,
Patricia Morton

****
Patricia Morton, PhD
Associate Professor of Architectural History
Media and Cultural Studies Department
University of California, Riverside

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

(X) The loss of a local cherished community parkland including the loss of access to the water.

(X) Removal of a water source that is currently supporting local wildlife.

(X) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

(X) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

(X) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

(X) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

(X) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

(X) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

(X) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

(X) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(X) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

(X) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

(X) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

(X) Exploration of alternative areas that do not require the destruction of the current ecosystem.

(X) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

(X) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

(X) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

(X) An alternative that seeks input from community members and takes this information into consideration.

(X) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

(X) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

(X) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Nicholas Villalobos Email Address:

Address:

Signature: Date: 6-14-25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

STATE OF CALIFORNIA Gavin Newsom, *Governor*

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Steven Quinn

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

June 6, 2025

Christina Monde
City of Pasadena
100 North Garfield Avenue
Pasadena CA 91101

Re: 2023110605 Arroyo Seco Water Reuse Project, Los Angeles County

Dear Ms. Monde:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) doys of determining that on application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 doys of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the releose of a negative declaration, mitigated negative declarotion or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal culturol resources.
- **d.** If necessary, project alternatives or appropriote measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmentol Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a Californio Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feosible olternatives or mitigation measures, including those measures that may be ogreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File"[i] searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@NAHC.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

cc: State Clearinghouse

From: Amy Nettleton
Sent: Sunday, June 29, 2025 2:50 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project, EIR scoping

June 29, 2025

Christina Monde, P.E.

City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: CMonde@cityofpasadena.net

Re: Arroyo Seco Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

I'm contacting you about the required environmental impact report for the proposed Arroyo Seco Water Reuse Project. The study needs to look closely at the following important issues, since the project poses serious harm to the environment.

Better Alternatives Study natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site to allow for less destructive ways to stop pollution upstream. Include a Do nothing alternative and an alternative that meets clean water goals by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course.

Wildlife and Trees This project proposes to remove 142 trees, including 42 that are protected by statute. That's almost 75% of the 195 trees in the project area. The study should address the impact of the tree removal and habitat destruction on the existing wildlife. And if habitat replacement is proposed as part of the project, how long it would take for new plantings to provide comparable habitat. Alternatives that maintain the existing native trees and shrubs should be considered.

Water Rights and Quality Document current water pollution levels and demonstrate how the cleanup will work. Study how taking 535 acre-feet of water affects downstream areas, and confirm that the cities have legal rights to take this water. Does the City of South Pasadena have the legal water rights to take 62 acre-feet of Arroyo Seco water for irrigation of the Arroyo Seco Golf Course?

Long-term Costs and Care This is complex infrastructure. The study should address who will maintain

it, how it will be funded post-construction, and benchmarks for long term monitoring and performance.

Construction Problems The estimated 17 months of construction, as noted in the MND, will create air pollution, noise, and disrupt park users. Consider project options that will accomplish the water quality goals with less construction-generated pollution.

Regional Planning The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to existing plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. How does the proposed project fit with over 20 years of Arroyo restoration plans and other watershed projects, as well as the recent Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024.

This project will destroy a natural stream ecosystem that provides important habitat right now, even though the area contains weedy species. The environmental study must document what exists today and require specific, enforceable remdiation for project impacts, with clear standards for monitoring and guaranteed long-term funding.

Thank you for considering these comments in the EIR scope of work.

Yours,

Amy Nettleton

From: robin newquist
Sent: Tuesday, June 24, 2025 9:42 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco EIR Scoping Comments

I urge Pasadena and South Pasadena to develop a program that will respect nature and improve conditions for fish, birds, wildlife, habitat, and people. We urge you to speak up for a natural Arroyo Seco.

Restore the Arroyo, Don't Degrade it!

Robin Newquist

To: Christina Monde, P.E., CMonde@cityofpasadena.net

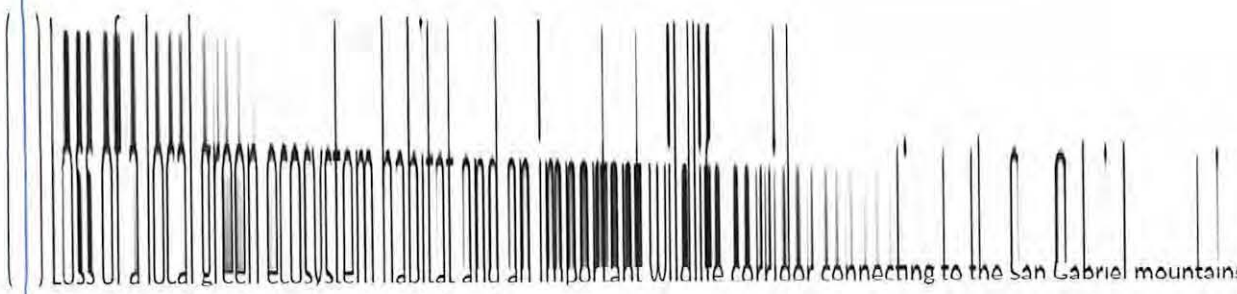
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( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.



( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

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EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

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( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

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( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

_____

TO: Christina Monde, P.E., Project Manager, City of Pasadena
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, California 91101
Email: cmonde@cityofpasadena.net

RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project

Thank you for the opportunity to submit our comments.
SAVE SAN PASCUAL PARK is a community-driven, grassroot-led opposition to the proposed Arroyo Seco Water Reuse Project. We oppose the project as planned. We demand a true nature-based solution with stream restoration, coupled with cleaning and stopping contamination at the source, and we ask for a better, longer-lasting solution that would benefit all residents, save the park, and maintain a much-needed wildlife corridor for wildlife.

Groups in opposition to the project: *Save San Pascual Park, Stewards of the Arroyo Seco, Friends of the South Pasadena Nature Park, City of Los Angeles Community Forest Advisory Committee (CFAC), Historic Garvanza Coalition, Highland Park Heritage Trust, Historic Highland Park Neighborhood Council, Arroyo Seco Neighborhood Council.*
Over one thousand residents have signed an opposition letter.

The EIR Must Comprehensively Address All of The Project's Significant Environmental Effects Resulting From:

1. The removal of a tree canopy consisting over 140 mature trees and bushes

- Psychological impact on the community from the loss of access to a public green and open space, including access to an urban forest and water stream, currently used and enjoyed by all.
- Loss of birds and animal habitat.
- Loss of a local riparian ecosystem and an important wildlife corridor connecting to the San Gabriel Mountains to the greater Lower Arroyo Seco.
- Increased noise pollution, including but not limited to, demolition and construction noise, increased freeway noise, ongoing maintenance, noise from intake filters and systems.
- Light pollution from freeway, houses, and sports field lights.
- Increased local air pollution from demolition, comparing mature canopy air filtration versus newly planted trees, and how it will affect groups sensitive to air pollutants, including the effects of additional air pollution on children at the adjacent San Pascual Elementary school.
- Detail the effects of the additional air pollution, to park visitors and physically active people in surrounding communities.
- Projected increase in local heat based on the loss of tree canopy and underground spring water.
- The Major Equestrian and Hiking Trails Plan specifies that trails should have a minimum tread width of then feet and cleared width of twelve feet, the trails for this project seem to be reduced to 5 feet. This plan does not comply with the Los Angeles Equestrian Plan.

2. Water Loss

- Provide specific data about how water capture at the site will reduce downstream flow and detail the effect this will have on downstream habitats, especially in summer months.

- How much water will evaporate annually as a result of building large pools of water.
- Detail pool structure. Will pools be lined or will they infiltrate the local groundwater and feed nearby plants.
- Detail the hydrological conditions at San Rafael and San Pascual sites and their capacity for ground water infiltration and replenishment.
- How will Garfias Spring be incorporated into the project.
- EIR must address the negative impacts this project will have on the whole future implementation of the Arroyo Seco natural restoration if so much water is removed from the Arroyo.
- Detail how the Arroyo Seco Water Reuse Project would prevent a natural restoration to the larger Arroyo Seco San including Steelhead Trout habitat restoration as detailed by the National Oceanic and Atmospheric Administration Steelhead recovery program.
- Loss of water annually (in terms of gallons) that will evaporate due to the loss of the tree canopy.

3. Cleaning the Water/Addressing pollutants

- Provide current and clear data on Arroyo Seco contamination sources (not 10 to 15-years-old data). Include contamination that includes E-Coli and known chemicals, data from north of the San Rafael site to south of the South Pasadena Golf Course.
- Detail where the main sources of pollution are occurring.
- Disclose where filters are located and whether any cleaning or filtration occurs at San Pascual Park.
- Detail location of where the water will be returned to the Arroyo Seco.
- Detail the amount of outfall pollutions coming out from the Altadena outlets in the Hahamongna basin and at the Rose Bowl.
- How will pollutants be addressed at the source, such as Johnston Lake, the South Pasadena Horse Stables, the Rose Bowl or the South Pasadena Golf Course. Provide details in reduction on contamination loads after source reduction is implemented.
- Identify other sources of pollution, best management practices, and/or educational programs that could be implemented to address the bacteria reduction goal.
- How will contamination from the South Pasadena Golf Course and parkland from pesticides and fertilizers be monitored and treated?
- If water is being returned to the Arroyo Seco from the South Pasadena Golf Course, provide details on the water quality that will be returned. If this water becomes contaminated from pesticides and fertilizers, how will this be addressed?
- Provide details on other options and alternatives for cleaning water that have been successful throughout the United States and the world, which could be implemented in the project without any destruction to the local habitats.

4. Water Diversion

- Provide proof of State of California Water Rights to divert millions of gallons of water from the Arroyo Seco to the South Pasadena Golf Course.
- Detail the water journey from San Rafael and back into the Arroyo, in detailed, quantifiable graph with plans. Provide clear details where will water be stored, infiltrated, or returned.
- Conduct a hydrology study that verifies ground water infiltration and recovery at the San Rafael, San Pascual, and the South Pasadena Golf Course sites.
- Provide clear and transparent data showing how much water being proposed to be diverted to the South Pasadena Golf Course annually, and what kind of groundwater infiltration is occurring. Detail if this diversion will be year-round? Detail if diversion will occur in drought years?
- Detail how water capture will change during each season and during times of drought.
- Detail the benefits or negative impacts of taking this amount of water from the Arroyo Seco and only returning a proposed 40% of it to the Arroyo Seco.
- Detail how much will the South Pasadena Golf Course pay for the water they will receive in perpetuity?

- Detail if the Golf Course currently using waters from the Arroyo Seco for watering their lawns.

5. CEQA Guidelines
Project must adhere to CEQA guidelines. The California Environmental Quality Act, Public Resources Code Section 21000 *et seq.* ("CEQA") requires a stable and consistent project description to facilitate public participation in the decision-making process. EIR must re-assess a measured and realistic assessment of project with all its negative consequences, and not copy and paste MND's data and conclusions.

6. A nature based alternative
The proposed project in San Pascual Park does not serve the needs of the community and the environment.

- EIR must offer at least 3 other viable Alternatives to the proposed project that include nature-based solutions (as required by Measure W) that consider stream restoration, wetland restoration, connectivity and wildlife habitat preservation, and how they relate to the greater Arroyo Seco restoration plans.
- The preferred project and all alternatives must include input and coordination with community members, including indigenous communities.
- A preferred nature based alternative should include removing contamination at the source.
- EIR should also detail the impact of a "No Build" option.
- The EIR Must Include an Accurate, Stable and Finite Project Description.
- EIR must explore a cost benefit analysis of each alternative.

EIR must also include:

- **Tribal Consultation:** Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

- In the MND process, not all public comments were addressed. The EIR must disclose, report and address all written EIR comments and communications from the public. Any comment submitted to the website must be included (*https://www.cityofpasadena.net/public-works/engineering-and-construction/construction/arroyo-seco-water-reuse-project/#comments)*

- Scoping meeting included very limited information about the project. Previous 2023-24 outreaches were very poor. EIR and Project managers must conduct on-going outreach and clear transparent information about the project to the community at large-Los Angeles, Pasadena, South Pasadena, at a radius of at least 3 miles from site, and include options for community's input verbal or written. Community must receive dates for meeting and public comment submission at least 30 days in advance.

- As proposed, the Project imposes a substantial burden on surrounding communities without providing any meaningful benefits to those communities. EIR must disclose all impacts to the local community. Detail the benefits, if any, of this project to Los Angeles City residents.

- The EIR must consult and include input from other environmental organizations, scientists, and stakeholders, including, but not limited to: California Fish and Wildlife, Santa Monica Mountain Conservancy, Sierra Club, Los Angeles and Pasadena chapters of Audubon Society, and the Los Angeles Regional Water Quality Board, so that the public at large has a full scope of information to review and address.

- Detail the Long-term Operations and Maintenance**.** Given the complexity of the proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity, life-cycle costs, and performance monitoring protocols. Provide scope of responsibility after the 30 years lease expires.

- Provide legal detail on how granting Los Angeles Park land in perpetuity does NOT violate the LA Charter, Section 594c.

- If Los Angeles Recreation and Parks provides a lease of the land to South Pasadena, how will the City of Los Angeles be compensated for this loss of land annually in perpetuity?

- Provide a detailed biological survey that observes all wildlife in the area, performed during multiple visits, at times when different species would naturally be observed, with the purpose of assessing the impact this project will have on wildlife, with a 30 year projected basis. Special emphasis should be given to wildlife which are species of special concern and potential extinction.

- EIR must explore whether Palm trees on San Pascual are Washingtonia Filliferia or Washingtonia Robusta or both. In the event that the Filliferias are observed, these palm trees must be preserved as they are native and endangered.

- A detailed study of the archeological impact that this project could have, both of indigenous people's tribal artifacts and remains as well as fossilized species and remains. The EIR must implement clear guidelines on how this project will be held or postponed by archeological discoveries, how they will be assessed, protected, and preserved. The EIR must detail the appropriate authority that will be monitoring the findings. Any discovery must have consultation with the relevant experts and authorities. The Gabrieleno Kizh must be the consulting experts for cultural and historical indigenous artifacts and remains. The Los Angeles Natural History Museum must be the consulting authority for fossilized remains.

- EIR must preserve historical integrity of the area including the Hitching post at the Los Angeles side of the park.

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Janis Ortega Email Address:

Address:

Signature: Date: May 24, 2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

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( ) The loss of a local cherished community parkland including the loss of access to the water.
( ) Removal of a water source that is currently supporting local wildlife.
( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.
( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
( ) An alternative that seeks input from community members and takes this information into consideration.
( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: YAEL PARDESS Email Address: ___

Address: ___

Signature: ___ Date: 5.24.25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Yael Pardess
Sent: Tuesday, May 27, 2025 10:44 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: EIR for San Pascual Scoping comment

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, California 91101
Email: cmonde@cityofpasadena.net

Christina Monde

It is inconceivable that in this age of global warming, that the city of Pasadena, known for its heritage trees and parks, even considers such a project,
destroying two natural gems, without thinking of alternatives that will not require removing a single tree. San Pascual is a Public Park is used and
loved by many and is an historical landmark for the Kizh Nation.
Pasadena did not fully consider all the negative impacts of this project in the inaccurate MND.

As a resident of Los Angeles CD1 and Park user, I am asking that the EIR includes:

Negative impacts resulting from:

1. The removal of over 140 mature trees and bushes, and their replacement with small saplings.
2. The loss of a local cherished community parkland, with loss of access to the water.
3. Removal of water source supporting local wildlife.
4. Loss of a local green ecosystem habitat, and an important wildlife corridor connecting to the San Gabriel mountains.
5. Loss of birds and animals whose habitat will be lost for more than 2 years.
6. Noise pollution from demolition, construction, and loss of trees that currently mitigate the noise, affecting all local communities.
7. Light pollution - Mature trees shield the community at night from the sport field lights and from FWY vehicles
8. Air pollution resulting from demolition, and loss of green canopy purifying the freeway pollution. Show clear data.
9. Heat islands that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
10. Water capture at the site will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

11. Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land,
water, wildlife and cultural resources.
12. Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity and wildlife habitat preservation
and the re-introduction of Steelhead Trout. LA County pledged 5 millions to consider stream restoration. Would the proposed project precent stream restoration
in this portion of the Arroyo?

13. EIR must address the issue of cleaning the pollution at the source. The proposed cleanup at San Pascual will not address the pollution going into the river

from known sources. Project proposed will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river.

14. Exploration of alternative areas that do not require the destruction of the current ecosystem.
15. Provide current and clear data on Arroyo Seco contamination sources (not 15-years-old data). Include contamination data from the South Pasadena

Golf Course and downstream from it.

16. Clear transparent data showing how much water is diverted to the Golf Course, infiltration, irrigation, or wetland support,

    and how it shifts during each season or during times of drought.

17. The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when maintenance ends.

Provide scope of responsibility after 30 years. Provide legal information on whether granting land in perpetuity violates the LA Charter 594 c.

18. An alternative that seeks input from community members and takes this information into consideration.
19. What are the benefits to LA City residents? What water will LA City receive? How much will South Pasadena Golf Course pay for the water they will

receive in perpetuity? If LA Recreation and Parks receive any money will it be in perpetuity?

20. A detailed biological survey that observes all wildlife using the area, done during multiple visits.

Name: Yael Pardess
Address: Date: 5.27.25

Yael Pardess

From: Pamela Perkins
Sent: Monday, June 30, 2025 6:45 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

Hello,

I am a member of equestrian trails incorporated ETI, and a volunteer for Pasadena Police Equestrian Unit. I ride from Arroyo Seco Stables north to the equestrian trails on both sides of the flood channel including Colorado St. and the Rose Bowl area. The equestrian trails near the south project site allow for horses to connect to the trails north of South Pasadena and through the areas on both the east and the west sides of the flood control channel.

The presentations I have reviewed do not clearly indicate whether horse passage will remain safe during the construction project. There was no mention of an environmental impact report to address and mitigate effects on equestrian trail traffic and other construction impacts. Additional signage would be helpful specifying that only hikers and equestrians are allowed on the Arroyo Seco trail. Currently the trail prohibits bicycles, but more signage would be extremely useful.

Our main concern is the safety of equestrians and hikers during construction. Please inform us about the accommodations for them and please submit our comments to the website, as they were not included before.

Sincerely,

Pamela Perkins

pkp

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(X) The loss of a local cherished community parkland including the loss of access to the water.
(X) Removal of a water source that is currently supporting local wildlife.
(X) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(X) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(X) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(X) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(X) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(X) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(X) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(X) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(X) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(X) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(X) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(X) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(X) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(X) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(X) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(X) An alternative that seeks input from community members and takes this information into consideration.
(X) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(X) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(X) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Richard J. Petrey Email Address:

Address:

Signature: Date: 5/24/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

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( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Citlali Pineda Email Address

Address:

Signature: Date: 6/13/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: Katharine Pinney
Sent: Monday, June 30, 2025 10:05 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

Good morning,

The current master plan for this project shows a shared path for equestrians and pedestrians. For safety reasons, there really should be a dedicated horse path separate from pedestrians. Having benches along the shared path gives me pause for safety reasons. If there is at least a buffer between horses and pedestrians (and dogs), then passing will be safer for all. Although our horses are seasoned trail horses (I ride out of the Arroyo Seco Barn), they are animals and can startle. A shared path without ample room for both will decrease the chances of an accident.

Thank you,

Katharine Pinney

Gung Hoe Garden Girls, Inc.

Mary Renaker

City of Pasadena Public Works Department
100 North Garfield Avenue
Pasadena, CA 91101

Re: Arroyo Seco Water Reuse Project

Dear City Council,

I am a resident of Santa Monica but I volunteer at the South Pasadena Nature Park because my daughter and grandchildren live nearby. I was born in Glendale in 1951 and am a fourth generation Monrovian. I know the wetland habitats we have already lost in this state, but also of the efforts in the north and south to daylight creeks, protect existing wetlands and create more parks and gardens with daylighted streams and rivers from San Francisco Bay to the San Dieguito River.

I share Barbara Eisenstein's dream of an Arroyo Seco as a living river, unbelted by concrete and a riparian streamside with contact to the San Gabriel foothills and the L.A. River. There are enough open spaces to allow it to overflow when flooding occurs. We need this river to be able to braid naturally and to view it as the amenity, gift and opportunity for the city and region that it is.

Barbara Eisenstein's vision is in line with what is happening to restore wetlands and fisheries all over this state and I share it. The US Army Corps of Engineers worked for years with LA County Flood Control and the cities along the Arroyo to study the feasibility of restoring it. Millions of dollars have been spent and the consensus is that we do not have to accept an ugly, degraded channelized river for the sake of flood protection.

We can start small in the parkland along the Arroyo Seco. Please keep your minds open to the possibilities and allow the river to flow and even flood as it always has. The Urban Creeks Council in Berkeley, CA, was formed in 1982! By Dr. Ann L. Riley and she has successfully daylighted creeks in the bay area near homes for only a block or two and yet they don't flood. She is executive director of the Waterways Restoration Institute, and watershed and river restoration advisor for the San Francisco Regional Water Quality Control Board. During her twelve-year tenure with the nonprofit Waterways Restoration Institute, she has organized, planned, designed, constructed, and funded numerous stream-restoration projects in California and throughout the United States. Her involvement and guidance to community-level nonprofits, as well as her work with local, state, and federal agencies in watershed planning, water quality, water conservation, hydrology, flood management, stream science, and

restoration, spans four decades. Ann Riley has written two books; *Restoring Neighborhood Streams* and *Restoring Streams in Cities: A Guide for Planners, Policymakers, and Citizens* available from Island Press.

Please visualize this. The Arroyo Seco diversion – that little wooded wildland and creek – could be the beginning of releasing the Arroyo Seco from its concrete straitjacket. It could be the model for continued work along the Arroyo from the mountains to its confluence with the LA River.

Instead of buried pumps and lined wetlands – all requiring maintenance – we could have this:





Thank you & best wishes for clean water and parks,

Mary Renaker

From: Marcus Renner
Sent: Saturday, June 28, 2025 12:57 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Comment for EIR Arroyo Seco Water Re-use Project

Dear Christina,

We met during the presentation/field trip for Westridge School in 2024. I attended the EIR scoping meeting in South Pasadena on May 28th and wanted to submit my comments on the project before the deadline on the 30th.

One of the elements that was not addressed in the presentation on the 28th that I think is vital for the success of the project is associated education and interpretative features for the project. With on-site, online, and city site visits, I want to encourage both Pasadena and South Pasadena to present this project as one-step towards the eventual restoration of the natural character and function of the Arroyo Seco. The desire to remove the flood control channel is in the Lower Arroyo Seco Master Plan and various city plans going back to the Jencks Resolution in 1964. This is not a controversial position. It's important that the public not see this project as an ending point but as an early step toward restoring a living stream with quality wildlife habitat and replenishment of the Arroyo's groundwater flows. I see the main value in this project as showing what an investment in stormwater infiltration and habitat restoration can accomplish. But again, this project must be framed as a beginning and not an end to the city's engagement with these spaces.

There is also an opportunity to educate the public about the specific history of these two sites. At the confluence with San Rafael Creek there is an opportunity to discuss the history of Johnston Lake, which was originally a wetland complex and only became a lake once settlers built an embankment across its outlet, and how San Rafael Creek created a deep swimming hole at its confluence with the Arroyo. This swimming hole, named Rocky Basin, was used for decades by children before the creation of a municipal swimming pool. Here is a quote from 1942 recalling the location:

"The old Arroyo Seco belonged to us boys; it was part of our life; it gave many of us stalwart bodies and taught us many things every boy should know about the natural display about him. Take swimming. Everyone knew how--learned in the Arroyo or Rocky Basin. Now there was a place (!) -- a little stream that meandered down from Johnson's Lake near Church of the Angeles (still there) on Ave. 64 eastward into the Arroyo. Much of this waterway was over a lava formation of the same material as Eagle Rock. At a particular spot a basin had been hollowed out by the force of the water. Here we disported in a great cup that nature had taken hundreds of years to construct for us -- but we weren't ungrateful as some now living can testify."

Kruckeberg, Arthur W. 1942. "Ghosts of the Old Arroyo Seco." *Ghost Town News*, February, 1.

I believe the article that contains this quote has a photo and the Pasadena Public Library also likely has an image of Rocky Basin that could be included on a panel. At the southern water filtration site, there is an opportunity to discuss the Garfias Spring that was the water source for the Garfias family that owned Rancho San Pascual prior to American settlement and built their two-story hacienda in 1852 at a site between 424-430 Arroyo Drive. The debt Manuel Garfias amassed building this house was why he sold the Rancho to Benjamin Wilson and John Griffin, who eventually sold the land to the Pasadena's founders in 1873. Both sites could discuss the presence of Gabrieleno/Tongva people, along the northern side of San Rafael Creek's canyon and around Garfias Spring, though it should avoid mention of legend of the Cathedral Oak and an Easter mass conducted at the site as part of Portola's expedition. There is no historical evidence for this event and official logs contradict the account. The panels could also discuss the steelhead trout that people routinely took from the Lower Arroyo in the early days of the city. People need to know that this project supports restoring a living stream. I am available to discuss ecological and historical points of interest to include in the site's interpretation based on my dissertation research on the canyon.

In addition to educational potential for the two sites, I want to encourage the EIR to consider the following aspects of the design.

What is the role of inflow from Garfias Spring to the southern infiltration site? The design for both locations should take into account its position within the floodplain and its connection to other historic springs and tributaries. The most important of these is Garfias Springs, which today surfaces in the Arroyo from the embankment behind the softball field. I believe a pipe routes this water under the field and into the southern site, which I believe is one of the primary sources of water for this location. The EIR should consider this site as part of the outflow for Garfias Spring into the Arroyo. At the scoping meeting, project personnel seemed to have no knowledge of Garfias Spring.

The EIR should also discuss how the sites would function in the future if local leadership and County Public Works moves forward on removal of the flood control channel and a more substantial restoration of the floodplain. There might be ways to maintain the infiltration benefits provided by the sites with a bit more advance planning. The EIR should also consider how the site would function in the event that the flood control channel overflows, which the Army Corps of Engineers has said is a distinct possibility. Again, building contingencies into the project will safeguard the investment of public funds.

The EIR should also address some more specific issues related to construction and maintenance:

How will the construction workers avoid compacting the soil during their work on the site? Compaction will not only affect the growth potential of native plants but also reduce water infiltration rates.

What are the impacts of paths through the site on wildlife? While the public should be able to travel through the sites, excessively wide crushed gravel paths will reduce the habitat value of the parcels.

What are points of access to standing water in the two sites for both people and wildlife? As a water quality project, there is clearly a risk of pollution by providing access to the water's edge for people, but the ability to touch the water is a recreational value that the site can potentially serve. This is especially important for the engagement of children. The design should also make accommodations for wildlife to reach the water

The EIR should also address the sites of water contamination flowing into San Rafael Creek. Again, this is an opportunity for education. The more the public understands the specific landscaping practices that are the impetus behind the project, the more value the project will have for the community at large. We need to change landscaping practices across the city. Water quality is only one of the reasons for this, but it is one of the most important ones. The project will be better if its interpretive elements and the EIR address the practices causing the water quality to fall out of compliance.

Please feel free to contact me for more information or clarification of these comments.

Best of luck,

Marcus Renner

--
Marcus Renner (he/him/his)
UC Davis Geography Graduate Group

"If the world were merely seductive, that would be easy. If it were merely challenging, that would be no problem. But I arise in the morning torn between a desire to improve the world and a desire to enjoy the world. This makes it hard to plan the day." -E.B. White, writer (1899-1985)

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

(✓) The loss of a local cherished community parkland including the loss of access to the water.

(✓) Removal of a water source that is currently supporting local wildlife.

(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.

(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

(✓) An alternative that seeks input from community members and takes this information into consideration.

(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

(✓) Additional comments:

Name: Constantia Blumhart Email Address

Address:

Signature: Date: 06/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Bianca Richards
Sent: Thursday, June 26, 2025 11:06 AM
To: Monde, Christina <Cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project Environmental Study

Dear Ms. Monde,

I'm writing about the environmental study for the proposed Arroyo Seco Water Reuse Project. This project could seriously harm the environment.
I live in South Pasadena and we are very fortunate to have Barbara Eisenstein as our resident expert on the Arroyo Seco.
She has spoken up and written extensively against this project and I fully support her comments.
Please read her important points-I have copied and pasted her comments, I could not have said this any better than she.

"What the Study Must Include
Better Alternatives: Study natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site, to allow for less destructive ways to stop pollution upstream. Also look at doing nothing and still meeting clean water goals by stopping pollution at the source.

Wildlife and Trees: This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually work. We would like to see alternatives that maintain the existing native trees and shrubs.

Water Rights and Quality: Show current water pollution levels, prove the cleanup will work, and study how taking 535 acre-feet of water affects downstream areas. In addition, confirm the cities have legal rights to take this water, including the 62 acre-feet that is guaranteed to the City of South Pasadena to irrigate its golf course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Also study how climate change affects everything.

Long-term Costs and Care: This is complex infrastructure. Study who will maintain it, how much it will cost over time, and how we'll know if it's working.

Construction Problems: The estimated 17 months or more of construction will create air pollution, noise, and disrupt park users. Look for projects that will accomplish the water quality goals with less construction-generated pollution.

Regional Planning: The addition of pipes, pumps, artificial filters, and lined wetlands to meet water

quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat

along the Arroyo Seco. Include projects that fit with 20+ years of Arroyo restoration plans and other watershed projects.

Native American Input: Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

Why This Matters

This project will destroy a natural stream ecosystem that, while impacted by weeds, still provides important habitat right now. The environmental study must show exactly what exists today and require specific, enforceable fixes with clear standards and guaranteed long-term funding.
The public and decision-makers need complete, honest information about what this project will destroy and whether there are better ways to clean the water that don't cause so much environmental damage.

Thank you for considering these comments in the EIR scope of work."

Bianca Richards

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(✓) An alternative that seeks input from community members and takes this information into consideration.
(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(✓) Additional comments:

Name: Rosa Rivas Email Address:

Address:

Signature: Rosa Rivas Date: May 24-2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

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( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

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( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

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( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Jesse Rojas Email Address:

Address:

Signature: Date: 05-24-2024

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Catherine Round
Sent: Monday, June 30, 2025 5:08 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project Concerns

Dear Ms. Monde,

My husband just sent you an email regarding the proposed Arroyo Seco Water Reuse Project, and I wanted to add my voice as well.

As an at-large member of the Historic Highland Park Neighborhood Council and as a resident of this community, I have deep concerns about the significant and lasting impact this project will have on our neighborhood, the Arroyo Seco, and the wildlife it supports.

I urge Pasadena to carefully reconsider the scope and approach of this project, to prioritize nature-based alternatives that protect our mature trees, wildlife habitat, and the character of this unique community we call home.

Thank you for your attention to this important matter.

Best regards,
Catherine Round
At-Large Member, Historic Highland Park Neighborhood Council

From: Aerienne Russell
Sent: Monday, June 23, 2025 1:40 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: EIR Scoping Comments

Dear Ms. Monde,

I respectfully submit these scoping comments for the Environmental Impact Report (EIR) for the proposed Arroyo Seco Water Reuse Project. Given the project's potential for significant environmental impacts, I request that the EIR provide comprehensive analysis of the following critical issues to ensure full compliance with CEQA.

Key Areas Requiring Thorough Environmental Analysis

1. **Project Alternatives Analysis:** The EIR must evaluate nature-based solutions (bioswales, constructed wetlands), upstream pollution control measures, phased restoration approaches, and a comprehensive no-project alternative that could achieve water quality goals with reduced environmental impacts.
2. **Biological Resources Impact Analysis:** The EIR must include complete biological surveys documenting existing riparian ecosystem functions, wildlife usage patterns, and cumulative habitat loss analysis. Specific assessment of impacts of removing 142 trees (including 42 protected trees) out of a total of 195 counted trees for both sites, and realistic timelines for replacement habitat functionality are essential. (Draft MND, Table 3)
3. **Hydrology, Water Quality and Water Rights:** The EIR must provide current water quality data, detailed TMDL compliance modeling, downstream flow impact assessment, and analysis of the legal authority to divert 535 acrefeet of water. Climate change resilience analysis is also required.
4. **Long-term Operations and Maintenance:** Given the complexity of proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity, life-cycle costs, and performance monitoring protocols.
5. **Construction Impacts:** The 17-month construction period requires detailed analysis of air quality, noise, traffic, and recreational impacts affecting multiple jurisdictions and park users.
6. **Regional Coordination and Cumulative Impacts:** The EIR must evaluate consistency with decades of Arroyo Seco restoration planning, regional watershed management objectives, and cumulative habitat loss throughout the region.
7. **Tribal Consultation:** Native American Consistent with AB 52, the EIR process must include meaningful consultation with Native American tribes with ancestral ties to the Arroyo Seco, including the Gabrieleno/Tongva Nation, Gabrieleno-Tongva Indian Tribe, and Kizh Nation.

Essential Requirements

The EIR must establish comprehensive baseline conditions through current biological surveys, recent water quality data, and existing recreational usage patterns. All significant impacts require specific, enforceable mitigation measures with performance standards and long-term funding mechanisms.

This project will eliminate an entire functioning riparian ecosystem and requires thorough environmental analysis to ensure decision-makers and the public have complete information about environmental consequences and alternatives that could meet project objectives with reduced impacts.

Thank you for considering these comments in the EIR scope of work.

Aerienne Russell

GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Monday, June 30, 2025

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101

Subject: Formal Comment on the Proposed Arroyo Seco Water Reuse Project

Dear Christina Monde,

This correspondence is submitted as a formal response to the **Notice of Preparation for the Proposed Arroyo Seco Water Reuse Project** within the region of *Hahamongna* Watershed. As you are aware, this area lies within our ancestral tribal territory and has long been recognized as a place of cultural, spiritual, and ecological significance to the Kizh Nation (Gabrieleño Band of Mission Indians).

We must emphasize that this project area is not only home to known and potential tribal cultural resources—including the high probability of encountering ancestral human remains—but also serves as an ecological corridor that has sustained diverse species of bird life, terrestrial animals, and aquatic life for thousands of years. This riparian ecosystem is rare and fragile, and any disruption threatens irreversible damage to both cultural heritage and biodiversity. For these reasons, we urge that this project be reassessed with full tribal consultation during the environmental review to account for these intersecting impacts.

In regard to the original consultation for a smaller component of the project, after further review and a clearer understanding of its scope, we must also state that there was never a complete formal consultation conducted with our tribe under CEQA or AB 52, as required by law. Due to the sensitivity of the area and its known connection to sacred sites and tribal cultural resources, we are formally requesting full avoidance of this location. Proceeding without addressing the potential impacts to cultural and natural resources would not only be a violation of the spirit and letter of consultation laws, but a continued disregard for the history and sovereignty as the original stewards of this land.

We remain committed to protecting our heritage and environment, and we respectfully request meaningful engagement moving forward.

Respectfully,

Hereditary Chief Andrew Salas
Gabrieleño Band of Mission Indians–Kizh Nation

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, Secretary
Mike Jesus Lemos, Treasurer I | Samantha Lemos, Treasurer II | Richard Gradias, Chairman of the council of Elders
PO Box 393 Covina, CA 91723 www.gabrielenoindians.org
admin@gabrielenoindians.org

SAVE
SAN PASCUAL PARK

TO: Christina Monde, P.E., Project Manager, City of Pasadena
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, California 91101
Email: cmonde@cityofpasadena.net

RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project

Thank you for the opportunity to submit our comments.
SAVE SAN PASCUAL PARK is a community-driven, grassroot-led opposition to the proposed Arroyo Seco Water Reuse Project. We oppose the project as planned. We demand a true nature-based solution with stream restoration, coupled with cleaning and stopping contamination at the source, and we ask for a better, longer-lasting solution that would benefit all residents, save the park, and maintain a much-needed wildlife corridor for wildlife.

Groups in opposition to the project: *Save San Pascual Park, Stewards of the Arroyo Seco, Friends of the South Pasadena Nature Park, City of Los Angeles Community Forest Advisory Committee (CFAC), Historic Garvanza Coalition, Highland Park Heritage Trust, Historic Highland Park Neighborhood Council, Arroyo Seco Neighborhood Council.*
Over one thousand residents have signed an opposition letter.

The EIR Must Comprehensively Address All of The Project's Significant Environmental Effects Resulting From:

1. **The removal of a tree canopy consisting over 140 mature trees and bushes**

- Psychological impact on the community from the loss of access to a public green and open space, including access to an urban forest and water stream, currently used and enjoyed by all.
- Loss of birds and animal habitat.
- Loss of a local riparian ecosystem and an important wildlife corridor connecting to the San Gabriel Mountains to the greater Lower Arroyo Seco.
- Increased noise pollution, including but not limited to, demolition and construction noise, increased freeway noise, ongoing maintenance, noise from intake filters and systems.
- Light pollution from freeway, houses, and sports field lights.
- Increased local air pollution from demolition, comparing mature canopy air filtration versus newly planted trees, and how it will affect groups sensitive to air pollutants, including the effects of additional air pollution on children at the adjacent San Pascual Elementary school.
- Detail the effects of the additional air pollution, to park visitors and physically active people in surrounding communities.
- Projected increase in local heat based on the loss of tree canopy and underground spring water.

2. Water Loss

- Provide specific data about how water capture at the site will reduce downstream flow and detail the effect this will have on downstream habitats, especially in summer months.
- How much water will evaporate annually as a result of building large pools of water.
- Detail pool structure. Will pools be lined or will they infiltrate the local groundwater and feed nearby plants.
- Detail the hydrological conditions at San Rafael and San Pascual sites and their capacity for ground water infiltration and replenishment.
- How will Garfias Spring be incorporated into the project.
- EIR must address the negative impacts this project will have on the whole future implementation of the Arroyo Seco natural restoration if so much water is removed from the Arroyo.
- Detail how the Arroyo Seco Water Reuse Project would prevent a natural restoration to the larger Arroyo Seco San including Steelhead Trout habitat restoration as detailed by the National Oceanic and Atmospheric Administration Steelhead recovery program.
- Loss of water annually (in terms of gallons) that will evaporate due to the loss of the tree canopy.

3. Cleaning the Water/Addressing pollutants

- Provide current and clear data on Arroyo Seco contamination sources (not 10 to 15-years-old data). Include contamination that includes E-Coli and known chemicals, data from north of the San Rafael site to south of the South Pasadena Golf Course.
- Detail where the main sources of pollution are occurring.
- Disclose where filters are located and whether any cleaning or filtration occurs at San Pascual Park.
- Detail location of where the water will be returned to the Arroyo Seco.
- Detail the amount of outfall pollutions coming out from the Altadena outlets in the Hahamongna basin and at the Rose Bowl.
- How will pollutants be addressed at the source, such as Johnston Lake, the South Pasadena Horse Stables, the Rose Bowl or the South Pasadena Golf Course. Provide details in reduction on contamination loads after source reduction is implemented.
- Identify other sources of pollution, best management practices, and/or educational programs that could be implemented to address the bacteria reduction goal.
- How will contamination from the South Pasadena Golf Course and parkland from pesticides and fertilizers be monitored and treated?
- If water is being returned to the Arroyo Seco from the South Pasadena Golf Course, provide details on the water quality that will be returned. If this water becomes contaminated from pesticides and fertilizers, how will this be addressed?
- Provide details on other options and alternatives for cleaning water that have been successful throughout the United States and the world, which could be implemented in the project without any destruction to the local habitats.

4. Water Diversion

- Provide proof of State of California Water Rights to divert millions of gallons of water from the Arroyo Seco to the South Pasadena Golf Course.
- Detail the water journey from San Rafael and back into the Arroyo, in detailed, quantifiable graph with plans. Provide clear details where will water be stored, infiltrated, or returned.
- Conduct a hydrology study that verifies ground water infiltration and recovery at the San Rafael, San Pascual, and the South Pasadena Golf Course sites.
- Provide clear and transparent data showing how much water being proposed to be diverted to the South Pasadena Golf Course annually, and what kind of groundwater infiltration is occurring. Detail if this diversion will be year-round? Detail if diversion will occur in drought years?

- Detail how water capture will change during each season and during times of drought.
- Detail the benefits or negative impacts of taking this amount of water from the Arroyo Seco and only returning a proposed 40% of it to the Arroyo Seco.
- Detail how much will the South Pasadena Golf Course pay for the water they will receive in perpetuity?
- Detail if the Golf Course currently using waters from the Arroyo Seco for watering their lawns.

5. CEQA Guidelines
Project must adhere to CEQA guidelines. The California Environmental Quality Act, Public Resources Code Section 21000 *et seq.* ("CEQA") requires a stable and consistent project description to facilitate public participation in the decision-making process. EIR must re-assess a measured and realistic assessment of project with all its negative consequences, and not copy and paste MND's data and conclusions.

6. A nature based alternative
The proposed project in San Pascual Park does not serve the needs of the community and the environment.

- EIR must offer at least 3 other viable Alternatives to the proposed project that include nature-based solutions (as required by Measure W) that consider stream restoration, wetland restoration, connectivity and wildlife habitat preservation, and how they relate to the greater Arroyo Seco restoration plans.
- The preferred project and all alternatives must include input and coordination with community members, including indigenous communities.
- A preferred nature based alternative should include removing contamination at the source.
- EIR should also detail the impact of a "No Build" option.
- The EIR Must Include an Accurate, Stable and Finite Project Description.
- EIR must explore a cost benefit analysis of each alternative.

EIR must also include:

- **Tribal Consultation:** Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

- In the MND process, not all public comments were addressed. The EIR must disclose, report and address all written EIR comments and communications from the public. Any comment submitted to the website must be included (*https://www.cityofpasadena.net/public-works/engineering-and-construction/construction/arroyo-seco-water-reuse-project/#comments)*

- Scoping meeting included very limited information about the project. Previous 2023-24 outreaches were very poor. EIR and Project managers must conduct on-going outreach and clear transparent information about the project to the community at large-Los Angeles, Pasadena, South Pasadena, at a radius of at least 3 miles from site, and include options for community's input verbal or written. Community must receive dates for meeting and public comment submission at least 30 days in advance.

- As proposed, the Project imposes a substantial burden on surrounding communities without providing any meaningful benefits to those communities. EIR must disclose all impacts to the local community. Detail the benefits, if any, of this project to Los Angeles City residents.

- The EIR must consult and include input from other environmental organizations, scientists, and stakeholders, including, but not limited to: California Fish and Wildlife, Santa Monica Mountain Conservancy, Sierra Club, Los Angeles and Pasadena chapters of Audubon Society, and the Los Angeles Regional Water Quality Board, so that the public at large has a full scope of information to review and address.

- Detail the Long-term Operations and Maintenance**.** Given the complexity of the proposed infrastructure, the EIR must analyze long-term operational requirements, municipal capacity, life-cycle costs, and performance monitoring protocols. Provide scope of responsibility after the 30 years lease expires.

- Provide legal detail on how granting Los Angeles Park land in perpetuity does NOT violate the LA Charter, Section 594c.

- If Los Angeles Recreation and Parks provides a lease of the land to South Pasadena, how will the City of Los Angeles be compensated for this loss of land annually in perpetuity?

- Provide a detailed biological survey that observes all wildlife in the area, performed during multiple visits, at times when different species would naturally be observed, with the purpose of assessing the impact this project will have on wildlife, with a 30 year projected basis. Special emphasis should be given to wildlife which are species of special concern and potential extinction.

- EIR must explore whether Palm trees on San Pascual are Washingtonia Filliferia or Washingtonia Robusta or both. In the event that the Filliferias are observed, these palm trees must be preserved as they are native and endangered.

- A detailed study of the archeological impact that this project could have, both of indigenous people's tribal artifacts and remains as well as fossilized species and remains. The EIR must implement clear guidelines on how this project will be held or postponed by archeological discoveries, how they will be assessed, protected, and preserved. The EIR must detail the appropriate authority that will be monitoring the findings. Any discovery must have consultation with the relevant experts and authorities. The Gabrieleno Kizh must be the consulting experts for cultural and historical indigenous artifacts and remains. The Los Angeles Natural History Museum must be the consulting authority for fossilized remains.

- EIR must preserve historical integrity of the area including the Hitching post at the Los Angeles side of the park.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

June 12, 2025

SENT VIA E-MAIL:
CMonde@cityofpasadena.net
Christina Monde, P.E.
City of Pasadena
Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101

Notice of Preparation of a Draft Environmental Impact Report for Arroyo Seco Water Reuse Project (Proposed Project) (SCH No: 2023110605)

South Coast Air Quality Management District (South Coast AQMD) staff appreciate the opportunity to comment on the above-mentioned document. Our comments are recommendations on the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Environmental Impact Report (EIR). Please send a copy of the Draft EIR upon its completion and public release directly to South Coast AQMD as copies of the Draft EIR submitted to the State Clearinghouse are not forwarded. **In addition, please send all appendices and technical documents related to the air quality, health risk, and greenhouse gas analyses (electronic versions of all emission calculation spreadsheets, air quality modeling, and health risk assessment input and output files, not PDF files). Any delays in providing all supporting documentation for our review will require additional review time beyond the end of the comment period.**

CEQA Air Quality Analysis

The Lead Agency is recommended to rely on the guidance provided in the South Coast AQMD's CEQA Air Quality Handbook and website[1] when preparing the air quality and greenhouse gas analyses. It is also recommended that the Lead Agency use the California Air Pollution Control Officers Association's California Emissions Estimator Model (CalEEMod)[2] software, to quantify emissions of air pollutants from typical land use development project.

In addition, the South Coast AQMD has adopted regional air quality significance thresholds[3] as well as localized significance thresholds (LST).[4] If the Lead Agency has not adopted its own significance thresholds, the Lead Agency is recommended to rely on South Coast AQMD's adopted thresholds for determining whether the Proposed Project's air quality and greenhouse gas

[1] South Coast AQMD's CEQA Air Quality Handbook and other resources for preparing air quality analyses can be found at: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.
[2] CalEEMod is available free of charge at: www.caleemod.com.
[3] South Coast AQMD's air quality significance thresholds can be found at: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf
[4] South Coast AQMD's guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

impacts are significant. It is important to note that the localized analysis can be conducted by either using the LST screening tables or performing air dispersion modeling.

The Lead Agency should identify any potential adverse air quality and greenhouse gas impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality and greenhouse gas impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips, and hauling trips). Operation-related air quality and greenhouse gas impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers and air pollution control devices), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality and greenhouse gas impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis. Furthermore, if the Lead Agency elects to rely on South Coast AQMD's air quality significance thresholds, the emissions from the overlapping construction and operational activities should be combined and compared to South Coast AQMD's air quality significance thresholds for *operation* to determine the level of significance.

If the Proposed Project generates diesel emissions from long-term construction or attracts diesel-fueled vehicular trips, especially if heavy-duty diesel-fueled vehicles will be used, it is recommended that the Lead Agency perform a mobile source health risk assessment.[5]

Also, if implementation of the Proposed Project would require the use of new stationary and portable sources, including but not limited to emergency generators, fire water pumps, boilers, spray booths, etc., one or more air permits from South Coast AQMD will be required, and the role of South Coast AQMD would change from a Commenting Agency under CEQA to a Responsible Agency as defined in CEQA Guidelines Section 15381. The assumptions in the air quality analysis in the EIR will be the basis for evaluating the air permit(s) under CEQA and imposing permit conditions and limits. Questions about air permit requirements should be directed to South Coast AQMD's Engineering and Permitting staff at (909) 396-3385.

In addition, CEQA Guidelines Section 15096 sets forth specific procedures for a Responsible Agency, including making a decision on the adequacy of the CEQA document for use as part of evaluating the applications for air permits. For these reasons, the EIR should include a discussion about any new stationary and portable equipment requiring South Coast AQMD air permits and identify South Coast AQMD as a Responsible Agency for the Proposed Project, if applicable. Also, as set forth in CEQA Guidelines Sections15086, the Lead Agency is required to consult with all Responsible Agencies with discretionary approval power over the Proposed Project. Thus, if air permits are required and South Coast AQMD is identified as a Responsible Agency, please let this comment letter serve as South Coast AQMD's request to convene a meeting with the Lead Agency as required by CEQA Guidelines Section 15104 to discuss the scope and content of the environmental information that will need to be included in the Draft EIR.

[5] South Coast AQMD's guidance for performing a mobile source health risk assessment can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis.

Mitigation Measures

In the event that the Proposed Project results in significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized to minimize these impacts. Any impacts resulting from mitigation measures must also be analyzed. Several resources to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project include South Coast AQMD's CEQA Air Quality Handbook,[6] South Coast AQMD's Mitigation Monitoring and Reporting Plan for the 2022 Air Quality Management Plan,[7] and Southern California Association of Government's Mitigation Monitoring and Reporting Plan for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy.[8]

South Coast AQMD staff is available to work with the Lead Agency to ensure that air quality, greenhouse gas, and health risk impacts from the Proposed Project are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact Zoya Banan, Ph.D., Air Quality Specialist, at ZBanan@aqmd.gov.

Sincerely,

Sam Wang

Sam Wang
Program Supervisor, CEQA IGR
Planning, Rule Development & Implementation

SW:ZB

LAC250514-02
Control Number

[6] https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook

[7] South Coast AQMD's 2022 Air Quality Management Plan can be found at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan (Chapter 4 - Control Strategy and Implementation).

[8] Southern California Association of Governments' 2020-2045 RTP/SCS can be found at: https://www.connectsocal.org/Documents/PEIR/certified/Exhibit-A_ConnectSoCal_PEIR.pdf.

From: richard schneider
Sent: Tuesday, June 24, 2025 9:08 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

Dear Ms. Monde,

I want to register my opposition to the Arroyo Seco Water Reuse Project as it is currently written. I would much rather see a nature based solution as has been proposed by environmental and citizen groups. I won't repeat their arguments here, but suffice it to say the current engineering is a monstrosity which should be abandoned.

Yours,
Richard Schneider, MD
Former mayor, City of South Pasadena

June 28, 2025

Christina Monde, P.E.
City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

Re: Arroyo Seco Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

I'm writing about the environmental study for the proposed *Arroyo Seco Water Reuse Project*. This project could seriously harm the environment, and the study needs to look closely at the following important issues.

Better Alternatives Please add natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site to allow for less destructive ways to stop pollution upstream. Also, look at doing nothing and still meeting clean water goals by stopping pollution at the source.

Wildlife and Trees This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually work. We would like to see alternatives that maintain the existing native trees and shrubs.

Water Rights and Quality Show current water pollution levels, prove how the project will affect water quality. Also, study how taking 535 acre-feet of water affects downstream areas, and confirm the cities have legal rights to take this water. Show that the City of South Pasadena has the legal water rights to take 62 acre-feet of Arroyo Seco water for irrigation of the Arroyo Seco Golf Course. Present alternatives that improve water quality by stopping pollution at the source, including mitigating for polluted runoff from the San Pascual Stables and the

Arroyo Seco Golf Course. Also study how climate change will affect water availibilty.

Long-term Costs and Care Who will maintain the complex infrastucture of the project. How much will it cost over time?

Construction Problems The estimated 17 months of construction, as noted in the MND, will create air pollution, noise, and disrupt park users. Look at alternatives that will accomplish the water quality goals with less construction-generated pollution.

Regional Planning The proposed addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. Include alternatives that are consistent with Arroyo restoration plans over the last 20 years and other watershed projects, including the recent Arroyo Seco Restoration Study announced by LA County Supervisor Kathryn Barger in March 2024.

Why This Matters

This project will destroy a natural stream ecosystem. The esisting conditions, although impacted by weeds, still provides important habitat. The environmental study must show what exists today and how the project will assure specific, enforceable fixes with clear standards and guaranteed long-term funding.

The public and decision-makers need complete, information about what this project will destroy and look at altenatives that clean the water in the Arroyso without causing so much environmental damage.

Thank you for considering these comments in the EIR scope of work.

Sincerly,

Jerry P. Schneider

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Andrew Seymour Email Address:

Address:

Signature: Date: 6/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(/) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(/) The loss of a local cherished community parkland including the loss of access to the water.
(/) Removal of a water source that is currently supporting local wildlife.
(/) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(/) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(/) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(/) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(/) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(/) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(/) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(/) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(/) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(/) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(/) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(/) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(/) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(/) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(/) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(/) An alternative that seeks input from community members and takes this information into consideration.
(/) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(/) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(/) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(/) Additional comments:

Name: Gloria D. Sierra Email Address:

Address:

Signature: Gloria D Sierra Date: May 24, '25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

From: Ed Simpson
Sent: Thursday, June 26, 2025 12:54 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Proposed Arroyo Seco Water Reuse Project

Dear Ms. Monde,

We are writing about the environmental study for the proposed Arroyo Seco Water Reuse Project. This project could seriously harm the environment, so the study needs to look closely at the following important issues.

- Better Alternatives: Study natural solutions like swales, non-lined wetlands, and removing the concrete channel at the San Rafael site, to allow for less destructive ways to stop pollution upstream. Also look at doing nothing and still meeting clean water goals by stopping pollution at the source.

- Wildlife and Trees: This project will cut down 142 trees, including 42 that are supposed to be protected. That's most of the 195 trees in the area. We need studies showing what wildlife lives there now and how long it would take for new habitat to actually work. We would like to see alternatives that maintain the existing native trees and shrubs.

- Water Rights and Quality: Show current water pollution levels, prove the cleanup will work, and study how taking 535 acre-feet of water affects downstream areas. In addition, confirm the cities have legal rights to take this water, including the 62 acre-feet that is guaranteed to the City of South Pasadena to irrigate its golf course. Present alternatives that improve water quality by stopping pollution at the source. This includes mitigating for polluted runoff from the San Pascual Stables and the Arroyo Seco Golf Course. Also study how climate change affects everything.

- Long-term Costs and Care: This is complex infrastructure. Study who will maintain it, how much it will cost over time, and how we'll know if it's working.

- Construction Problems: The estimated 17 months or more of construction will create air pollution, noise, and disrupt park users. Look for projects that will accomplish the water quality goals with less construction-generated pollution.

- Regional Planning: The addition of pipes, pumps, artificial filters, and lined wetlands to meet water quality requirements is contrary to plans to introduce natural hydrologic function and improve habitat along the Arroyo Seco. Include projects that fit with 20+ years of Arroyo restoration plans and other watershed projects.

- Native American Input: Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

Why This Matters

This project will destroy a natural stream ecosystem that, while impacted by weeds, still provides important habitat right now. The environmental study must show exactly what exists today and require specific, enforceable fixes with clear standards and guaranteed long-term funding.The public and decision-makers need complete, honest information about what this project will destroy and whether there are better ways to clean the water that don't cause so much environmental damage.

For those of us who worked long ago to ’save the Arroyo’ and for all who have helped keep it a beautiful space for nature, we hope you will consider these comments in the EIR scope of work.

Sincerely,
Beatrice and Edward Simpson
South Pasadena, CA

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(√) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(√) The loss of a local cherished community parkland including the loss of access to the water.
(√) Removal of a water source that is currently supporting local wildlife.
(√) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(√) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
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(√) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(√) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(√) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.
(√) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(√) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

(√) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

(√) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(√) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(√) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
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(√) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Veronica Smith Email Address

Address:

Signature: VS Date: 6/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

John “Jack” Smith
Community Forestry Advisory Committee Representative CD 14
ISA Certified Arborist WE-14264A

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101
E-mail: CMonde@cityofpasadena.net

RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project, regarding the palm trees at the San Pascual site

June 29, 2025

I am an International Society of Arboriculture (ISA) certified arborist. I serve as the CD 14 representative for the City of Los Angeles Community Forestry Advisory Committee.

As the representative I am often asked to look at trees. In this case, I was asked to look at the palm trees at the San Pascual Park site to see if the tree report prepared by the City of Pasadena for the Arroyo Seco Water Reuse Project was accurate. Residents had concerns that many of the trees were California Palms (Washingtonia filifera) instead of Mexican fan palms (Washingtonia robusta) as indicated in the report. California Palms (Washingtonia filifera) are native trees.

On June 28, 2025, I visited the east side of San Pascual Park which is located adjacent to Stoney Drive and San Pascual Avenue and observed the palms. I am not an expert on palm trees, but am very familiar with Mexican fan Palms (Washingtonia robusta). Most of the palms at the San Pascual site seem to have characteristics that are not normally found in Mexican fan palms (Washingtonia robusta):

- Their fronds are larger than Mexican fan palms (Washingtonia robusta)
- None of these trees were reported to be taller than 60 feet in the tree report prepared.
- Mexican fan palms lose their fronds, these palms retain them.
- The Diameter at Breast Height (DBH) of these palms is greater than those of Mexican fan palms (Washingtonia robusta)
- These palms have barrel like trunks.

- I observed sideways growth which Mexican fan palms do not have.

I suggest that the Environmental Impact Report (EIR) include an evaluation by a biologist or an arborist who specializes and is familiar with California palms (Washingtonia filifera). There are known to be California palms on Orange Grove. They are listed on the Pasadena City website at https://www.cityofpasadena.net/district6/featured-stories/the-legacy-and-challenges-of-pasadenas-trees/ where it states, “Orange Grove Boulevard, where the Rose Parade begins, is lined with California’s native palm, the Washingtonia filifera,”

The EIR should explore the history of how these trees were introduced to this location and when. According to residents there are photos that appear to show the palms in this location in as far back as 1937.

Thank you for the opportunity to provide these comments.

Jack Smith,
Community Advisory Committee Representative, CD 14
ISA Certified Arborist WE-14264A

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(✓) An alternative that seeks input from community members and takes this information into consideration.
(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Clara Solis Email Address:

Address:

Signature: Clara Solis Date: 6/27/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

Clara M Solis

June 30, 2025

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101
E-mail: CMonde@cityofpasadena.net

RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project

I am providing the following scoping comments for the above referenced project. Based upon the facts that have been represented to the public on this project, I have serious concerns regarding how this project as proposed will impact:

- The health and well-being of the San Pascual neighborhood,
- The pollution and heat island impacts mitigation provided by the mature trees that will be removed.
- The health and well-being of children at San Pascual STEAM magnet
- Wildlife who live on the San Pascual site,
- Downstream wildlife as so much water is removed from the channel,
- Public access to the San Pascual site that has been used by the public since the Arroyo Seco was channelized beginning in the late 1930's.
- The ability to complete nature-based restoration of the Arroyo Seco channel if this project is completed. It should specifically study which portions of the Arroyo Seco channel could no longer be restored because of this project.
- How ceding Los Angeles Park land in perpetuity with control for facilities by South Pasadena impacts residents of Los Angeles.
- South Pasadena will retain possession of the facility at the San Pascual site
  In perpetuity but maintenance will only be for 30 years. How will the public be impacted by this.
- The cultural, historical and biological resources of the Gabrieleno Kizh Nation
- I have viewed photographs of the San Pascual site from 1937, the California Palms it appears that these were misidentified in the Mitigated Negative Declaration. See report of ISA certified arborist John "Jack" Smith.
- Historical resources including:
  - the Arroyo Stone Hitching Post located on Los Angeles City Park Land,
  - a historic park – San Pascual Park / Arroyo Seco Park, Transmission lines.
  - Historic trees including Western Sycamores, Coast Live Oaks, Toyon, Blue Elderberry, California Palms and understory plants on an area that has existed well before the Arroyo Seco was channelized.
  - The Historic Arroyo Seco Parkway It is a National Civil Engineering Landmark, a National Scenic Byway, and the first of just two California Historic Parkways. In 2011, the Parkway and associated features were listed in the National Register of Historic Places as the Arroyo Seco Parkway Historic District. The removal of

the trees would impact this scenic byway. A large part of the beauty of the Arroyo Seco is the trees.

These issues must be fully addressed in the environmental impact report (EIR) and a nature-based alternative with restoration of the Arroyo Seco Channel with green infrastructure approaches including bioswales, constructed wetlands and natural stormwater management systems along with eliminating contamination at the source that provides a project better suited to this unique location adjacent to the Arroyo Seco Channel must be assessed.

All of the issues brought up in this letter and all of the comment letters must be investigated and studied in the EIR. Additionally, CEQA requires mitigation of an adverse impacts.

I submit these scoping comments for the Environmental Impact Report (EIR) for the proposed Arroyo Seco Water Reuse Project. Given the project's potential for significant environmental impacts, I request that the EIR provide comprehensive analysis of the issues identified below to ensure full compliance with the California Environmental Quality Act (CEQA).

The EIR Must Comprehensively Address All of The Project's Significant Environmental Effects.

To be legally adequate, an EIR must comprehensively identify and address all of the "significant environmental effects" of a proposed project. (Public Resources Code § 21100(b)(1); CEQA Guidelines § 15126.2.) "All phases of a project," including "planning, acquisition, development, and operation," must be addressed. (CEQA Guidelines § 15126.) And both "[d]irect and indirect significant environmental effects" must be analyzed, "giving due consideration to both the short-term and long-term effects." (CEQA Guidelines § 15126.2(a).)

Adequate Public Notice Must Be Provided. Most residents of the San Pascual Neighborhood received no notice. Further, we are concerned if LAUSD, the San Pascual STEAM Magnet Elementary School and School Board member Rocio Rivas received notice of this Scoping NOP? The students at San Pascual are sensitive receptors and will be impacted by this project. An extension for the comment period should be made and the school, LAUSD and LAUSD Board member Rocio Rivas should be contacted for her comments. I verified just now that she did not receive notice.

It is disappointing that the City did not include an initial study with the NOP, which would allow the public to be better able to comment on the potential impacts.

The City must consult with the Gabrieleno Kizh Nation. The Kizh Nation who were found by the Native American Heritage Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation

The City should consult with SMMC (I think this is correct because it is a recreational area), CDFW, RWQCB, State Water Board and others as part of the scoping process.

NOP incorrectly states that no potential for geological, transportation or public services impacts. These should be studied in the EIR as well.

The City of Los Angeles must be consulted with and identified as a responsible agency for the Project, and the EIR must identify the City of Los Angeles's authority over this site."

Required Areas of Environmental Analysis in the Environmental Impact Report (EIR)

The EIR Must Analyze the Project's Air Quality

1. EIR must Connect the Project's Air Quality Impacts to their Likely Health Consequences.

Lead agencies are required under CEQA not only to identify significant air quality impacts, but to explain the nature and magnitude of these impacts and connect these impacts to their consequences on public health. Thus, the City must comply with this mandate and ensure the Project EIR's air quality analysis contains not only a detailed explanation of significant air quality impacts, but also their consequences to public health.

2. The City Must Analyze and Disclose the Project's Construction Air Quality Impacts.

Construction of the Project may lead to significant air quality impacts. Construction of the project may lead to increased fugitive dust arising from grading, excavating, demolition, and other construction. operations, which leads to PM10 pollution. Additionally, use of diesel-powered construction equipment and vehicles will lead to PM2.5 pollution, as well as pollution of NOx, another criteria pollutant. The City, in the Project EIR, must fully analyze and disclose the impacts from these emissions, as well as apply all feasible mitigation measures.

This project is located within a short distance to the 110 freeway. All of the residents of the San Pascual Valley neighborhood live within a quarter mile of the freeway. Some live as close as 25 feet from the freeway.

Much of the population of the San Pascual neighborhood can be considered an environmental justice community. Many are renters living in rent stabilized units. A majority of the population are linguistically isolated. Many of the older apartment units in the neighborhood lack air conditioning.

For most of this San Pascual community, there is a FREEWAY ADJACENT ADVISORY NOTICE which states: (See attached)

Air pollution studies indicate a strong link between the chronic exposure of populations to vehicle exhaust and particulate matter from roads and freeways and elevated risk of adverse health impacts, particularly in sensitive populations such as young children and older adults. Areas located within 500 feet of a freeway1 are known to experience the greatest concentrations of fine and ultrafine particulate matter (PM), a pollutant implicated in asthma and other health conditions.

Freeways are a major stationary source of air pollution and their impact on the air we breathe and public health in cities continues to be a subject of public health research. Scientific literature previously focused on impacts to immediately surrounding communities within 500 feet of freeways; however, recent studies have established strong links to negative health outcomes affecting sensitive populations at a distance of 1,000 feet from freeways, (and in some instances, up to one mile). Therefore, the Department of City Planning is using the 1,000 feet boundary, as the distancing threshold, for conservative consideration of risk to the negative effects of air pollution caused by freeway proximity.

Because of the foregoing, the EIR should conduct a study on how the removal of mature trees will impact the air pollution.

Trees and bushes planted near highways significantly reduce air pollution caused by motor vehicles: Roadside vegetation reduces air pollution through several mechanisms, including by creating a large surface area onto which small particles adhere.

Tiny pores on the leaves of trees, called stomata, inhale air that contains toxic pollutants. Once absorbed, gases, including pollutants such as Sulphur Dioxid (SO_2), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO), and ozone, diffuse within the inner surfaces of the leaves, and are broken down. Carbon Dioxide (CO_2) is removed through photosynthesis. The byproduct is oxygen.
Trees help reduce noises by absorbing, deflecting, refracting, or masking sound waves.
Trees block light pollution.

The San Pascual Neighborhood is bordered on the NW by the Avenue 66 hillside, on the south by the Arroyo Seco parkway, and on the east by the hillside below Arroyo Dr. There are three access points,

down Arroyo, down Stoney Drive or down San Pascual. The shape is a bowl making it vulnerable to air pollution and heat island impacts. What has protected the neighborhood is its extensive tree canopy. Unfortunately, development has resulted in tree removal has reducing the protective canopy. We are concerned that the loss of an entire small forest will increase pollution and heat island impacts. Additionally, the South Pasadena Ball Park's lights are very tall and strong. If this small forest is removed, the light will disturb humans and wildlife.

Further, Palms are on a very narrow list of trees that don't contribute as much pollen to the air as other species. One of the benefits of having them is that they benefit the air quality to a higher level than other trees. Pasadena received a grant from the South Coast Air Quality Management District, which recently awarded Pasadena a $15,000 grant the city is now using to replace the aging palms

See also: https://www.dailybulletin.com/2011/04/09/pasadena-uses-creative-financing-to-replace-boulevards-palm-trees/
In 2011, Pasadena received a grant from the South Coast Air Quality Management District, which recently awarded Pasadena a $15,000 grant the city is now using to replace the aging palms, Barar said.

"Palms are on a very narrow list of trees that don't contribute as much pollen to the air as other species," she said. "One of the benefits of having them is that they benefit the air quality to a higher level than other trees."
Original estimates of $5,000 to replace each of the 75 dead Washingtonia filifera have been drastically scaled back.

The EIR MUST STUDY OTHER POLLUTION AND HEAT ISLAND IMPACTS, Green house gases

The EIR should conduct a study on how the removal of mature trees will impact the pollution and heat island impacts. Trees and bushes planted near highways significantly reduce noise, and light pollution caused by motor vehicles. It also reduces heat island impacts. What will the impact of this loss be on this environmental justice community that is estimated by Cal Enviroscreen 4.0 to be more than 60 percent linguistically isolated.

PUMP STATION:

The EIR should study on how the pump station will impact residents who live nearby and park users. It should study both noise and smells from the station. It should do a survey/study that provides data on maintenance problems and complaints from residents to similar pump stations. Are similar pump stations usually placed so close to residences and where park users run and walk through every day?

NOISE STUDY:

A noise study on the construction noise, noise from the pump station and if there will be an increase in noise in the San Pascual Valley when the 142 trees are removed. The study should examine if there will be an increase in freeway noise to nearby residents. It should also examine noise from the South Pasadena Ball fields will increase to nearby residents in Los Angeles. How will noise pollution impact sensitive receptors who use the park? How long will it take for the new trees to reach the same height as the current trees? What will be the noise pollution impacts from this?

LIGHT POLLUTION:
The lights from the South Pasadena Ball fields are on almost every evening even after sport participants have finished playing. Frequently, they are left on past 9 pm in the evening. The lights are very bright and appear to be about 80 feet tall. How will the community across the channel be impacted by light pollution when the 142 trees are removed? This should be examined and mitigation offered for residents.

CONSTRUCTION POLLUTION:

The EIR must carefully examine construction impacts on residents of the San Pascual valley. The study should examine how users of the main part of San Pascual Park will be impacted by the project. Children daily play at the park and are sensitive receptors, sensitive to noise and air pollution. Seniors also use the park daily and are sensitive to pollution impacts. What type of construction vehicles will be used? Will they use diesel? How will use of diesel trucks impact sensitive receptors? What will be the daily number of trucks that will pass through the area? How will this project impact nearby school children at San Pascual STEAM Magnet Elementary School? How will construction impact nearby residents? How will the noise impact residents?

Further, as this community is adjacent to the freeway, I ask that the Air quality data for the Project sites be studied at a Monitoring Station closer to this community. The Mitigated Negative Declaration used the Pasadena South Wilson Avenue Monitoring Station located at 752 South Wilson Avenue, Pasadena, 91101 which is not representative of the San Pascual valley.

B. The EIR Must Fully Analyze the Project's Recreation Impacts.

Residents from Los Angeles have reported using the San Pascual site since the 1950's. Many an older resident recalls tramping through the area catching frogs. Youth built BMX trails at the South end of the site on South Pasadena portion of the site and still come back today. Bird watchers and wildlife enthusiasts visit the site to view wildlife first hand. Residents sit under the trees on hot days. Enjoying the cooling effect of the forest. It is at least 10 degrees cooler. Hundreds of residents use the Los Angeles portion of the San Pascual site (a part of San Pascual park joined by lot tie) for exercise and enjoyment each day Joggers, runners and walkers run through the City of Los Angeles portion of San Pascual each day. Equestrian riders also ride through the City of Los Angeles' park land each day. Children from a play group at the main park take walks in the San Pascual site to see the wildlife. (See Appendix for photos of current users of this area of the park)

1. **What will be the impact to current residents who use this part of San Pascual park?**

The plan presented in the MND will build a man-made treatment facility on site. How much of the .53 acres that will be used by the facility will still be available for use to residents after the project is built. Since there will be a fence around the basin and the pump station will be on San Pascual Park land, please provide measurements of how much land would no longer be available for residents to walk on, include the size of the pump station and how much land would be available.

The EIR must study how the loss of this space will impact park users.

The EIR must study how the construction and closing a portion of San Pascual Park will impact the hundreds of people who use this park each day.

2. **Pump Station:**

How will the noise from the pump station effect residents walking and running through here?
How will the noise from the pump station impact wildlife? Will residents who enjoy seeing wildlife in their park, still be able to observe them.

How will the smells from the pump station impact residents walking through the area? Will it make walks and runs unpleasant? How will this impact sensitive receptors including seniors and children who walk through here daily?

Is it normal to have a pump such as this in a heavily used recreation area?

How often will the filters be cleaned? How often do pumps break down? Conduct a survey/study of other facilities using this technology. Examine problems areas, complaints from nearby neighbors, how close are these types of facilities usually to recreation areas? Could the pump station be placed elsewhere where it would not impact park users and nearby residents?

3. Equestrian Users of the Park

How will this project impact equestrian users of the park? LAMC
The Major Equestrian and Hiking Trails Plan specifies that trails should have a minimum tread width of ten feet and a cleared width of twelve feet, the trails for this project seem to be reduced to 5 feet. How does that comply with Los Angeles plans? How will that impact both equestrian riders and hikers?

LA Council File 20-0230 Recommended Design trails adjacent to streets to be at least 12 feet in width, with tread that is at least 10 feet in width, to accommodate a double track. Trail widths may be reduced in cases where topography or space is prohibitive. In such cases, no trail width should be less than 8 feet.

See comments below from previous equestrian users of the park. Each of these concerns should be addressed and studied in the EIR. Any adverse impacts must be mitigated under CEQA:

Equestrian Trails, Inc. is an organization dedicated to the maintenance and improvement of riding and hiking trails throughout the county. Corral 2 is responsible for the trails in the Pasadena, South Pasadena, La Canada Flintridge, and Altadena areas. This organization has been actively involved in all proposed projects within the Arroyo Seco, with a focus on the impacts to the equestrian and hiking trails. We had representatives attend the public meetings for this project which appear to have impacts to our equestrian and hiking trail systems in the Lower Pasadena Arroyo and South Pasadena.
The equestrian trails near the south project site allow horses to connect to the trails north of South Pasadena through the area on both the east and west sides of the flood control channel. he presentations I reviewed are unclear if horse passage will remain and be safe, especially during project construction.
Currently, the area on the west side of the flood control channel near the San Rafael Bridge is a safe alternative to the east side trail with an unrepaired land slide from rains last winter. If the San Rafael site is going to close the trail, we would ask that the City of Pasadena repair the east side trail so that horses can safely pass through.
I noticed that there was no reference to the completion of an Environmental Impact Report (EIR) to bring into consideration and be prepared to address and/or mitigate impacts to the equestrian trails, traffic, and other construction related impacts. Perhaps the TMDL mandate is a CEQA exemption; if you could provide information related to this project and CEQA, we would appreciate it. In addition, Pursuant to CEQA guideline 15072, I am requesting that I be placed on the mailing list for any proposal by the City of Pasadena and/or South Pasadena to adopt environmental documentation in relation to projects concerning this project. This would include, but is not limited to, plans related to the both sites for this project. The documentation of interest is any notices for public comment opportunities as well as environmental impact reports, Negative Declarations, Mitigated Negative Declarations and / or approval requests for categorical or statutory exemptions under CEQA. Please mail such documentation to:

board my horses at the Arroyo Seco Stables and ride on these trails connec ng the stables to the river mul ple mes per week. We will need safe access for our horses which means prohibi ng bicycles and motorized vehicles from sharing our route. I am sure you can find a way to accommodate us by providing fencing of some kind and placing signage indica ng the trail is a hiking/equestrian trail. I would be happy to speak to someone regarding this.
My name is and I am a member of Equestrian Trails Inc. (ETI) Corral # 2. ETI is a non-profit organization dedicated to the Preservation of Equestrian Trails, Good Horsemanship and Equine

Legislation. I am an equestrian who frequently rides my horse in the Arroyo..
I have several questions and look forward to your response.
A) What are the plans to make the horse and hiking trail safe in the Arroyo Seco Reuse Water Project?
B) Do you have an equine consultant appointed to the Arroyo Reuse Water Project Committee? If
not, ETI Corral #2, a local equestrian trail group would be happy to participate. I can provide that contact information. An equestrian stakeholder, who is familiar with the local trail conditions and their connections would be a valuable asset to the Committee.
C) Do you have signage to post the trail as "Only hikers and equestrians allowed" in both the Pasadena and South Pasadena sections of the Arroyo Seco Trail? Currently, the trail prohibits bicycles
and signage is posted on the Pasadena entrance to the Arroyo Seco trail north of the San Pascual stables.
This is a good example of the type of information that can be exchanged with engaged and knowledgeable equestrians supporting your committee efforts.
In closing, I would appreciate being notified beforehand of the Third Community Meeting for the Arroyo Seco Water Reuse Project. My e-mail is
Best regards,

1. **Project Alternatives Analysis**

The EIR must include a robust alternatives analysis that evaluates:
Nature-based solutions alternative: Detailed comparison of green infrastructure approaches including bioswales, constructed wetlands, and natural stormwater management systems. Point-source pollution control alternative: Analysis of upstream pollution prevention measures as a more cost-effective approach to TMDL compliance.

Alternative must specifically consider

1) Removing pollution at the source and
2) Doing natural stream restoration beginning at points between the Colorado Street bridge and York Blvd bridge. EIR must examine possible locations where concrete could be removed from the channel allowing for natural restoration to occur with nature based solutions for clean-up.

EIR MUST STUDY HOW TO REDUCE/and or ELIMINATE CONTAMINANTS AT THE SOURCE:
r
EIR MUST STUDY WHERE are the SOURCES OF CONTAMINATION AND PROVIDE DATA REGARDING CONTAMINANTS
AND STUDY AND EVALUATE METHODS AND THEIR EFFICACY TO LIMIT, STOP AND REMOVE CONTAMINANTS AT SOURCE. DOCUMENTATION MUST PROVIDE DATA.

While this project is concerned with removing e-coli and fecal cloriform, we have concerns that placing water in the aquifer that still contains other contaminants can contaminate the groundwater. It is therefore essential that sources of contamination be examined and that clean-up at the source be conducted.

Further, the EIR should study this issue. Is there a potential for aquifer contamination if this project attempts to use still contaminated water to replenish the aquifer.

A related question is whether the aquifer can be replenished as proposed at the South Pasadena Golf Course. This should be studied in the EIR. Note that it is stated in:

Appendix E-2: Geotechnical Evaluation San Pascual Site

> *Shallow Bedrock Impact to Stormwater Infiltration: The perched groundwater encountered at the contact between the younger alluvium and bedrock in borings B-1A, B-2A, and P-4A suggests that the site bedrock will significantly reduce the effectiveness of on-site stormwater infiltration. It is anticipated that the general fine-grained and dense nature of the bedrock will impede the downward infiltration of water.*

Then inexplicably without explanation or substantiation this opinion. The EIR study must explain this. The statement above seems to contradict this opinion. How is this substantiated. What evidence is there?

> *It is our opinion that the stormwater will infiltrate through the younger alluvial deposits and migrate laterally along the bedrock/alluvial contact.*

An in depth examination should be conducted which examines outfall pollution collected by the various jurisdictions along the Arroyo Seco. At areas where the pollution is elevated an examination and study of the source of the pollution and ways to eliminate, limit or remove contamination should be conducted. (SEE APPENDIX A FOR AN EXAMPLE OF INFORMATION COLLECTED BY THE CITY OF LOS ANGELES)

Areas requiring special attention and study are: Brookside Golf Course, South Pasadena Golf Course, South Pasadena stables and Arroyo Seco stables and any other golf courses, stables and horse property along the Arroyo Seco.

EIR must study contamination from Horse Stables and how it can be reduced

Horse manure can be a source of e-coli, nitrogen, phosphorus and carbon. Ammonia from manure can cause excessive algae growth.

https://www.nps.gov/articles/000/manure-management.htm
https://www.canr.msu.edu/resources/one_horse_or_a_hundred_manure_and_water_dont_mix_wo1020

“Although horse wastes (manure, urine and soiled bedding) are organic, biodegradable materials, many of their physical, biological and chemical properties (such as sediment, phosphorous, nutrients, and bacteria) can be detrimental to water quality and can adversely affect human health and aquatic life in water bodies. Many of the nutrients ingested by horses return to the environment in feces and urine. When carried by runoff to streams and lakes, excessive amounts of these same nutrients can stimulate unwanted algae blooms in creeks and streams, causing a decrease in dissolved oxygen in water, which stifles aquatic life.”

Bioswales a shallow channel of graded soil with vegetation. The swales can be graded at a shallow slope and can have meandering paths. They lengthen the distance that stormwater runoff travels before it will reach a local waterway, increasing the chance it will infiltrate before discharging into the waterway. The site below contains information on bioswales which can reduce contamination from horse stables.

https://esc.rutgers.edu/research/ryders-lane-farm/water-quality-management/

The EIR must study the Arroyo Seco Watershed Management & Restoration Plan, PROJECT: SP-2: San Pasqual Stables BMPs and how this could contain concentrated non-point sources of contamination at the stables to have as high a degree of containment as possible How can this work as a part of a nature based solution with restoration and clean-up at the source. Should include Study on project SP-2 the installation of bioretention areas along the channel in strategic locations adjacent to the stables, this chance could be further reduced.

Below are photos of run-off which includes horse manure (a source of e-coli) from the South Pasadena stables. Note that an actual pipe is sending run-off that is flowing into the Arroyo Seco channel






The EIR must address pollution from the South Pasadena Golf Course entering the Arroyo Seco Channel.

Additionally, an examination of how to contain run-off from fertilizer, pesticides and other contaminants from the golf course must be conducted. I am particularly concerned that the stream running through the golf course sends fertilizer and pesticides into the Arroyo Seco Stream.

There is an unmarked outfall just North of Outfall 222-81. Water gushes out of it in the afternoon sending sudsy water into the Arroyo Seco channel. Note that the numbered outfall has very little water coming from it but the unmarked outfall is gushing. I was there about 20 minutes and the water release did not diminish. The water from this unmarked outfall must be tested for contaminants.

See below photos of outfall 222-81 and an upstream outfall that is unmarked. It appears to enter from where the stream at the golf course exits. Also see photos of golf balls from the golf course in the Arroyo Seco channel.











Residences: Examine how a prohibition of use of fertilizers and pesticides prior to rains would help in reducing harmful run-off. How have other municipalities done this to prevent contamination. Evaluate effectiveness of measures.

We have viewed run off from homes in Busch Gardens onto the trail. How could an educational program advising residents living adjacent to the channel that their fertilizer and pesticides to landscaping can pollute the Arroyo Seco and that they should not direct run-off from their homes into the Arroyo Seco Channel. How could an ordinances prohibiting residents from dumping dirty water onto the trail help? A review of measures other municipalities have taken and their efficacy should be studied in the EIR.

The EIR should study and examine ways to eliminate tire, brake and other vehicle dust from Roadways and Freeways from entering the Arroyo Seco Channel. Study and provide data how that could reduce contamination in the Arroyo Seco. Study how implementation of measures can reduce contamination in the Arroyo Seco.

This is important because: "Recent studies have found that tire wear particles comprise approximately 85% of the microplastics identified in waterways (Werbowski et al. 2021)."

Study should do a research review on strategies to limit/ eliminate roadway dust from vehicle tires and brakes. EIR should study how implementing these strategies could reduce contamination. Samples of research are listed below:

The EIR should study this because if the aquifer will indeed be replenished with water from the Arroyo and it contains brake and tire dust it could contaminate the aquifer.

See EPA Publication for strategies: Opportunities to Address Tire Wear Particles In Waterways
https://www.epa.gov/system/files/documents/2023-04/TFW%20TWPs%20Roundtable%20Summary%202022%20CLEAN%20March%2030%202023%20508%20compliant.pdf
https://www.sciencedirect.com/science/article/abs/pii/S0048969723051628

Review: Mitigation measures to reduce tire and road wear particles



Some strategies for reducing brake and tire dust that must be studied in the EIR are:

1. Source Reduction:
    - Reduce vehicle weight: Lighter vehicles place less strain on brakes and tires, leading to less wear and fewer emissions.
    - Improve tire material: Optimizing tire materials and structures can improve wear resistance and reduce particle generation.
    - Develop low-dust brake pads: Ceramic and organic brake pads produce less dust than traditional semi-metallic pads.
    - Explore alternative braking systems: Technologies like regenerative braking in electric vehicles can reduce friction and dust during deceleration.
    - Investigate alternative tire materials: Research is ongoing to find alternative tire and pavement designs that meet safety requirements while reducing particle generation.
2. Capture and Filtration:

- Stormwater management systems: Retention ponds, wetlands, and rain gardens can capture tire and brake dust particles before they enter waterways.
- Vegetated filter strips (VFS): These vegetated areas designed to treat sheet flow runoff are effective at slowing down runoff, filtering out sediment, and providing some infiltration.
- Electrostatic plates: One startup has developed an electrostatic plate that can be affixed to tires to remove up to 60% of emitted particles.
- Street sweeping: Regularly sweeping streets helps to prevent debris and chemicals, including tire particles, from entering stormwater drainage systems.

3. End-of-Pipe Treatment:
    - Microbiological degradation: Microorganisms can be used to degrade tire wear particles and reduce their molecular weight, mitigating environmental risks.
4. Regulatory Measures:
    - Euro 7 regulations: These regulations, to be implemented in Europe in 2026, will regulate particle emissions from brakes and tires.
    - California regulations: California requires tire makers to declare an alternative to 6PPD, a harmful chemical found in tires, by 2024.
    - EPA initiatives: The EPA is convening stakeholders and conducting research to address tire wear particle pollution.
5. Individual Actions:
    - Choose low-dust brake pads: Replacing existing brake pads with ceramic or organic options can significantly reduce dust.
    - Maintain vehicle and tires: Regularly washing wheels and maintaining proper tire inflation can help minimize particle generation and buildup.
    - Modify driving habits: Avoiding hard braking and coasting more can reduce wear on brake pads and tires.
    - Consider dust shields: While not suitable for all vehicles, dust shields can help capture brake dust before it reaches the wheels.
    - Support improved public transit: Encouraging the use of public transit, especially trams, can reduce the number of vehicles on the road and consequently, tire and brake dust emissions.

Stopping brake and tire dust from entering waterways requires a multi-faceted approach involving source reduction, capture and filtration, end-of-pipe treatment, regulations, individual actions, and ongoing research and monitoring.

Phased restoration alternative: Gradual invasive species removal with habitat preservation rather than wholesale site clearing

No build project alternative: Comprehensive baseline conditions analysis
Rationale: CEQA requires consideration of alternatives that could reduce environmental impacts while meeting project objectives.

2. Biological Resources Impact Analysis

The EIR must provide a complete and accurate assessment of the environmental setting and Project-related impacts to biological resources is needed to both identify appropriate avoidance, minimization, and mitigation measures and demonstrate that these measures reduce Project impacts to a level that is less than significant.

Mitigation Measures: CEQA requires that an MND include mitigation measures to avoid or reduce significant impacts. mitigation measures for an assessment of biological resources, bats, burrowing owl (Athene cunicularia), nesting birds, artificial nighttime lightning, and CVMSHCP compliance.

It must provide comprehensive biological resources assessment including: Baseline habitat assessment: Complete biological survey documenting existing riparian woodland ecosystem functions, wildlife usage patterns, and ecological services provided

Cumulative habitat loss analysis: Regional context of riparian habitat loss and this project's contribution to cumulative impacts. How will the reduction of water in the Arroyo Seco Channel impact wildlife that lives there. What are the cumulative impacts?

Wildlife impact assessment: Detailed analysis of impacts to birds, fish, amphibians, and insects currently utilizing the site. The MND found very few animals and did not document fish or bats. Yet every day that we are there we see fish and an abundance of animals and insects. The assessment must be conducted at appropriate times when wildlife would be expected to be observed.

A bat study must be completed. We have observed bats at this location. Hoary bats have been found nearby. The EIR should also look for Western Yellow Bats (*Lasiurus xanthinus) and Red Bats*. Because it is probable that the palm trees were misidentified as Mexican fan palms (Washingtonia robusta) rather than California palms (Washingtonia filifera) and the palm fronds stay on these trees which provide can provide habitat for the Western Yellow Bat is important that a bat study be conducted at the proper time. Below is an excerpt from CDFW memo:

> The western yellow bat is uncommon in California, known only in Los Angeles and San Bernardino Cos. south to the Mexican border. This species has been recorded below 600 m (2000 ft) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. This species occurs year-round in California. Barbour and Davis (1969) suggested thatthis species may be increasing in range and abundance in the U.S.SPECIFIC HABITAT REQUIREMENTSFeeding: Feeds on flying insects. Forages over water and among trees. Flight is slow and steady. Capable of rapid flight but fairly maneuverable. Cover: Roosts in trees. Has been captured roosting under palm trees. Reproduction: Probably forms small maternity groups in trees and palms. Water: No data found. Probably requires water. Pattern: Roosts and feeds in, and near, palm oases and riparian habitat.
>
> In California, western **yellow bats appear to roost exclusively in the skirt of dead fronds of both native and non-native palm trees and appear to be limited in their distribution by availability of palm habitat**2 . Western yellow bats probably form small maternity groups in palm trees3 . Some individuals or populations may be migratory, although some individuals appear to be present year-round, even in the northernmost portion of the range including southern California2

See also below for mitigation measures and when to look for bats. The MND's mitigation measures and procedures for locating bats did not comply with this memo and often made no sense logistically. The EIR must adequately study and provide mitigation measure for adverse impacts.

Mitigation measures:
Tree removal work with the potential to house roosting bats shall be performed between September 1 and October 31 to minimize direct impacts to roosting bats. This time period is after young are volant (flying) but before expected onset of torpor (wintering inactivity). Tree removal work may also be conducted between February 15 and March 31, following winter torpor and
prior to the start of the maternity season. No tree removals shall occur during the hibernation season, which typically begins in November or December (depending on weather conditions) and continues through mid-February, due to the high potential for mortality of hibernating bats.

https://files.ceqanet.opr.ca.gov/285560-1/attachment/zj67k1CYOAq10lwYq13ceqV-IE1IxzzKiur-O3y8iui_NNE1nM3VppehVa2u5fVr3akmXoId1gcB8Ahl0

Tree impact analysis: Individual assessment of all 142 trees proposed for removal, including the 42 protected trees, with specific mitigation requirements per CDFW and tree replacements and mitigation under the laws of the City of Los Angeles including LAMC 46.00 – 46.06 and under South Pasadena and Pasadena protected and significant tree ordinances.

The EIR must include a tree study that complies with Los Angeles Recreation and Park Trees Guidelines and with the Los Angeles Protected Tree and Shrub Regulations (LAMC 46.00- 46.06)
Replacements must be provided for non-protected trees removed on Los Angeles Recreation and Parks land.

The EIR study must document who it will comply with the Los Angeles Protected Tree and Shrub Regulations (LAMC 46.00- 46.06) Note that the MND had some trees were misidentified and corrected in the Response to Comments, Clarifications, and Mitigation Monitoring and Reporting Program. For example, trees 343, 344 and 345 were misidentified as Blue Elderberries (*Sambucus nigra* ssp. *Caerulea),* but were actually Coast Live Oaks (*Quercus agrifolia)* (Table 20, Page 26)

The tree replacements identified in the MND did not comply with the regulations of the Recreation and Parks department. It appears that the report was creating a category of CDFW mitigation that would be negotiated. However if a tree is in the City of Los Angeles there must be replacements as indicated in LAMC 46.01 to 46.06. Mitigation under CDFW must also be provided. LAMC 46.00-46.01 requires replacement for any protected trees as specified by the regulation. We ask that the study try to be more accurate and clearly specify which trees are both in CDFW and in Los Angeles so we can determine that LAMC 46.00 is being followed.

See https://www.laparks.org/sites/default/files/forest/pdf/Appendices.pdf

REPLACEMENT OF TREES Whenever trees are removed, the existing trees' aggregate diameter, measured at breast height (D.B.H., or 4.5-feet above the ground; multi-trunk trees are to be measured immediately below the lowest trunk) shall be replaced at an equal or greater rate of caliper of new trees. Each one-inch D.B.H. of existing tree shall be replaced with a minimum one-inch caliper new tree. Replacement trees shall have a minimum caliper of ¼-inch. For example, a single-trunk tree whose D.B.H. is 9 inches may be replaced with 36 trees of ¼-inch caliper, or with 3 trees of 3-inch caliper. This replacement ratio should

It appears that California fan palms (Washingtonia filifera) were misidentified as Mexican fan palms (Washingtonia robusta) See Jack Smith, ISA certified arborist' letter regarding this. A botanist, biologist or ISA Certified Arborist who is an expert on California fan palms should verify this.

The tree report in the MND identified the palm trees as Mexican fan palms which are non-native invasive. The claim has been that they need to get rid of these invasive non-native trees. However, the majority of these trees are probably not Mexican fan palms (Washingtonia robusta) instead they are California palms (Washingtonia filifera) which are native to California and not invasive. A botanist or biologist or ISA certified arborist with expertise in California palms should verify the type of palms that are there. Here is a letter from the CD 14 CFAC representative, Jack Smith.

Further in Pasadena, they consider them historic. We have photos from 1937 that show a palm at the San Pascual site. Why aren't these historic?
Pasadena clearly knows that there are California palms (Washingtonia filifera) in the area. They have a historic grove on Orange Grove. Here is an article on the City of Pasadena website that mentions them. https://www.cityofpasadena.net/district6/featured-stories/the-legacy-and-challenges-of-pasadenas-trees/ where it states, **"Orange Grove Boulevard, where the Rose Parade begins, is lined with California's native palm, the Washingtonia filifera,"**
See also: https://www.dailybulletin.com/2011/04/09/pasadena-uses-creative-financing-to-replace-boulevards-palm-trees/
In 2011, Pasadena received a grant from the **South Coast Air Quality Management District**, which recently awarded Pasadena a $15,000 grant the city is now using to replace the aging palms, Barar said. **"Palms are on a very narrow list of trees that don't contribute as much pollen to the air as other species," she said. "One of the benefits of having them is that they benefit the air quality to a higher level than other trees."**
Original estimates of $5,000 to replace each of the 75 dead **Washingtonia filifera** have been drastically scaled back

Restoration timeline analysis: Realistic assessment of time required for replacement plantings to provide equivalent ecological function

Invasive species management alternatives: Comparison of wholesale habitat removal versus targeted invasive species management approaches
Rationale: The project will eliminate an entire functioning ecosystem that currently provides ecological services despite degraded conditions.

EIR must study the Arroyo Seco Watershed Management & Restoration Plan
Will this project conflict with PROJECT: SP-3: Arroyo Seco Channel Naturalization (See Appendix)

> Project Overview: The Arroyo Seco is wide and surrounded by open space for a small stretch between the 110 Freeway bridge to the north and the York Street Bridge to the south in South Pasadena / Los Angeles. Even during storm events, flow velocities are lower here due to the width of the channel. It may be feasible to remove the concrete channel or channel bottom in this stretch, producing a restored stream reach in the midst of urban Los Angeles / South Pasadena.

3. Hydrology and Water Quality
Request: The EIR must include comprehensive hydrological analysis:
Current water quality data: Recent sampling and analysis of water quality throughout the project area including downstream from the San Pascual site to establish baseline conditions
TMDL compliance analysis: Detailed modeling showing how project will meet Total Maximum Daily Load requirements with current data

Downstream flow impact assessment: Quantitative analysis of reduced flows on downstream Arroyo Seco Channel habitat and ecology

Groundwater impact analysis: Assessment of project effects on local groundwater recharge and quality
Water rights analysis: Legal review of South Pasadena's authority to divert 214 acre-feet of stormwater
Climate change resilience: Analysis of project performance under various climate scenarios and drought conditions

Fundamental water quality data gaps undermine the project's stated objectives and legal compliance.

4. Long-term Maintenance and Operations Analysis
The EIR must evaluate long-term operational impacts:
Maintenance requirements assessment: Detailed analysis of ongoing maintenance needs for pumps, filters, diversions, and planted areas
Municipal capacity analysis: Assessment of Pasadena and South Pasadena's demonstrated ability to maintain complex infrastructure and native plantings
Long-term cost analysis: Life-cycle cost assessment including maintenance, replacement, and failure scenarios.
It must examine what will happen after the 30 year lease is up and maintenance is no longer required even though the facilities built will remain in perpetuity. How will this impact park users? How will it impact sensitive receptors? How will it impact nearby residents?

Performance monitoring requirements: Detailed monitoring protocols to ensure project effectiveness over time
South Pasadena’s poor track record with native habitat maintenance raises questions about project long-term viability.

The EIR Must Analyze the Project’s Land Use and Planning Impacts.
CEQA Guidelines section 15125, subdivision (d) requires the EIR to analyze and disclose any inconsistencies with relevant land use plans. There are several applicable land use plans that apply to the Project site.

Specifically the EIR must evaluate how making a portion of San Pascual Park inaccessible to park users complies with the Los Angeles General Plan, the various elements of the plan, the Northeast Los Angeles Community Plan, the Charter of Los Angeles, including LA Charter Section 594 (c), LA City ordinances and regulations, the various goals, objectives and policies of the plans.

Consistency with Regional Planning: The EIR must analyze project consistency with regional plans:
Arroyo Seco restoration compatibility:

Assessment of project impacts on future restoration efforts by LA County Flood Control
Regional coordination analysis: Evaluation of project coordination with other Arroyo Seco corridor stakeholders
Regional watershed planning consistency: Analysis of project alignment with broader watershed management objectives
Future infrastructure conflicts: Assessment of how proposed infrastructure may impede future restoration projects
The project must be evaluated in the context of decades of restoration planning and millions of dollars in restoration investments.

A list is provided below, but the EIR should independently study which plans, goals, objectives, ordinances, charters, regulations may be inconsistent.

1. **Los Angeles General Plan** and each of the elements of the plan taking special note of the Noise Element, Air Quality Element, Conservation Element must be evaluated for compliance.

   Open Space Element – The EIR must study if the project conflicts with Open Space goals, objectives and definitions.

   Open Space is broadly defined as land that is essentially free of structures and buildings and/or is natural in character and enhances Northeast Los Angeles by providing: Recreational or educational opportunities, Scenic, cultural, or historic resources, Public health or safety, Community identity, Rights-of-way for utilities or transportation facilities, Nature preserves or ecologically important areas, Preservation of physical resources, including ridge protection

   Goals and Objectives:
   Goals
   To ensure the preservation and conservation of sufficient open space to serve the recreational, environmental, health and safety needs of the City. To conserve unique natural features, scenic areas, cultural and appropriate historical monuments for the benefit and enioyment of the public. To provide an open space system which provides identity, form and a visual framework to the City.

   To conserve and/or preserve those open space areas containing the City's environmental resources including air and water.
   To provide access, where appropriate, to open space lands.

   The Los Angeles General Plan, Northeast Los Angeles was found to have a deficiency of Parkland of 344.84 acres of Neighborhood Parks, 386.66 acres of Community Parks and 1556.98 acres of Regional Parks, how does removing access to a portion of San Pascual Park meet the goal preserving and conserving sufficient open space to serve the needs of the City?

2. **NORTHEAST LOS ANGELES COMMUNITY PLAN**

Goal
To ensure the preservation and conservation of sufficient open space to serve the recreational, environmental, health and safety needs of the City. To conserve unique natural features, scenic areas, cultural and appropriate historical monuments for the benefit and enioyment of the public.

To provide an open space system which provides identity, form and a visual framework to the City.

To conserve and/or preserve those open space areas containing the City's environmental resources including air and water.
To provide access, where appropriate, to open space lands.

Objective 4-2 To preserve existing open space resources and, where possible, encourage acquisition of new open space.

Policies 4-2.1 Accommodate and promote active use of parklands and open space and promote and preserve greenways. Program: The Plan Map designates publicly-owned lands for open space uses including Lincoln Park, Ernest B. Debs Regional Park, Hazard Park, Ascot Reservoir, and Arroyo Seco Park.

GOAL 5 Objective 5-1 ADEQUATE RECREATION AND PARK FACILITIES TO MEET THE NEEDS OF THE RESIDENTS IN THE PLAN AREA.

To conserve, expand, maintain, and better utilize existing recreation and park facilities to address the recreational needs of the community.

Policies 5-1.1 Preserve the existing recreational facilities and park space. Program: The Plan assists in preserving such facilities and park space by changing existing zones, as applicable, to the Open Space Zone, which provides such protection.

- Evaluate how removing accessible park land from community use does not conflict with this policy.

5-1.2 Increase accessibility to park land along the Arroyo Seco and potential parkland along the Los Angeles River. Program: The Plan Map and legend retain the proposed equestrian trail which would provide a means to increase accessibility along this area. In addition, the Plan text supports the completion of this trail.
Evaluate how enclosing San Pascual Park land inside a fenced off area to be used as water reuse facility conforms to this policy.

3. **LAMC 63.44 REGULATIONS AFFECTING PARK AND RECREATION AREAS.**
4. **The Major Equestrian and Hiking Trails Plan**
5. **The Los Angeles City Charter at Section 594 (c) states:**
   (c) Restrictions on Transfer of Dedicated Parks. All lands heretofore or hereafter set apart or dedicated as a public park shall forever remain for the use of the public inviolate; but the board may authorize use of the lands for any park purpose, and for:"

   The EIR must address:
   How a lease can be used for San Pascual Parkland that is used by the public given that a large portion of the .53 acres will be occupied by the water reuse facility and no longer accessible to the public?
   The public has used this land since the 1930's. See photos below of use:








Since the facilities will be given for the use of the City of South Pasadena “in perpetuity” how is this not a violation of the Section 594 (c)? See page 41 of MND.

Under what provision of Section 594 c is the lease being given?

(1) Easements or rights-of-way for any work, improvement or structure necessary and convenient for giving service to the City or its inhabitants in connection with any public utility owned by the City. Under similar circumstances, similar permission may be given to any private public utility holding a franchise, and limited to the life of the franchise. These easements or rights-of-way shall be subject to regulation by ordinance.

(2) Leases to the County of Los Angeles, the Los Angeles Unified School District, the State of California, or the United States for a period not to exceed 50 years, of a site in any public park for the erection and maintenance of public buildings consistent with public park purposes.

(3) Taking and disposal of molding sand, or other natural resources under terms as the board may prescribe and in a manner as to work no substantial impairment of public use and enjoyment of the premises.

(4) Opening, establishment and maintenance of streets or other public ways in and through the park lands controlled by the board.

(d) **Transfer to Purposes other than Recreation and Park Purposes.** No sites under the management and control of the department shall be devoted or transferred to any other purpose in whole or in part, except in compliance with all of the following:

(1) *Procedure.* Any transfer shall require a resolution of the board, approved by the Council by ordinance, incorporating the prescribed terms and conditions to be observed by the permittee. However, Council approval shall not be required for the granting of leases of property not immediately needed for the purposes of the department for a term not to exceed three years.

(2) *Restrictions on Transfer.* No transfer shall be permitted if it would violate the provisions of subsection (c) of this section, or in any case where the proposed use violates a specific trust or dedication upon which the property was acquired.

(3) *Requirement of Equivalent Property or Funds.* If property to be transferred to another use has been acquired from funds specifically provided for the Department of Recreation and Parks or its predecessors, the department shall be assigned the equivalent in property or funds as a condition of transfer of the property from its control, when required by the board.

(e) **Remaining Land Unsuitable for Park Use.** Where lands forming a portion of an existing public park have been removed from the jurisdiction of the board by reason of their dedication or use for public purposes incompatible with park use, the remaining lands, or any portion thereof, within the park shall not be subject to the provisions of subsection (c) of this section in the event that:

(1) the board and Council find and determine that the remaining lands, or specific portion thereof, are unsuitable for further use as a public park; and

(2) lands of an area at least equal to the lands found to be unsuitable for further use as a public park are acquired in the same portion of the City and set apart or dedicated as a public park.

Sec. 595. Lease of Facilities.

The Board of Recreation and Park Commissioners may lease for recreational purposes any municipal auditoriums, arenas, sports centers or related facilities subject to the following conditions:

(a) The term of the lease shall not exceed 35 years. Leases in excess of five years shall be approved by the Council by ordinance.

(b) The public must be entitled to use and enjoy the property or facility for the purposes for which it was acquired, constructed or completed and any lease shall require the lessee to operate the property or facility so as to furnish the public with that use and enjoyment.

(c) The board may enter into the lease without inviting bids and may prescribe other terms and conditions as it deems appropriate.

Construction Impact Analysis
Request: The EIR must thoroughly analyze construction-phase impacts:
Air quality impacts: Detailed modeling of dust and emissions from 17-month construction period affecting multiple jurisdictions
Noise impact assessment: Quantitative noise analysis for heavy equipment operations affecting park users in Pasadena, South Pasadena, and Los Angeles
Traffic and access impacts: Analysis of construction vehicle impacts on local roads and park access
Recreational impact assessment: Detailed analysis of construction impacts on existing recreational uses
Construction mitigation measures: Comprehensive mitigation plan for construction-phase impacts

7. Cumulative Impact Analysis
Request: The EIR must include comprehensive cumulative impact assessment:
Regional habitat loss: Analysis of project contribution to cumulative loss of riparian habitat in the region
Watershed-wide impacts: Assessment of cumulative effects of multiple water diversion projects on Arroyo Seco flows
Climate change interaction: Analysis of how project impacts may be exacerbated by climate change effects
Development pressure impacts: Assessment of how this project may encourage similar infrastructure projects in sensitive areas

Baseline Data Requirements
The EIR must establish comprehensive baseline conditions including:
Current biological surveys conducted by qualified biologists
Recent water quality data throughout the project area
Existing hydrology and flow patterns
Current recreational usage patterns
Existing noise and air quality conditions
Complete documentation of existing vegetation and wildlife habitat

Mitigation Measure Requirements
The EIR must identify specific, enforceable mitigation measures for all significant impacts, including:
Habitat replacement ratios that account for temporal loss of ecological function
Long-term maintenance funding mechanisms and performance standards
Monitoring protocols with specific success criteria and adaptive management triggers
Construction impact minimization measures with specific performance standards

Public Participation and Regional Coordination
Request: The EIR process must include meaningful coordination with:
Adjacent jurisdictions (Pasadena, Los Angeles) affected by project impacts
Regional planning agencies and restoration organizations
Environmental organizations with expertise in Arroyo Seco restoration
Community groups representing affected park users

Tribal Consultation: Consistent with AB 52, the EIR process must include meaningful consultation with the Gabrieleno Band of Mission Indians – Kizh Nation who were found by the Native American Heritage

Commission to have sacred land within the vicinity of the Project site. This consultation must acknowledge that the Gabrieleno Kizh Nation are experts on the land, biological resources, historical resources and cultural resources and that these resources must be protected in a manner prescribed by the Gabrieleno Kizh nation.

HISTORIC RESOURCES

San Pascual Park has been identified in the City's Historic Resources database as being a possible historic resource. The transmission lines located nearby are also designated as possible historic resources.

Annexation into the City of Los Angeles by northeast communities was motivated by the possibility of Arroyo Seco adjacent parks. EIR should study if how this new use of a historic parkland area will impact our historic city.

Historic trees including Western Sycamores, Coast Live Oaks, Toyon, Blue Elderberry, California Palms and understory plants on an area that has existed well before the Arroyo Seco was channelized.

The Historic Arroyo Seco Parkway It is a National Civil Engineering Landmark, a National Scenic Byway, and the first of just two California Historic Parkways. In 2011, the Parkway and associated features were listed in the National Register of Historic Places as the Arroyo Seco Parkway Historic District. The removal of trees impact on this scenic parkway must be studied.

Neighborhood residents are concerned that the hitching post that sits on the San Pascual site will be removed. Can the EIR document if this historic structure can be preserved and its providence?

Conclusion
This project has the potential for significant environmental impacts that require thorough analysis under CEQA. The requested scope of analysis will ensure that decision-makers and the public have complete information about the project's environmental consequences and alternatives that could reduce those impacts while still meeting legitimate project objectives.

The proposed Arroyo Seco Water Reuse Project would be located at an important and unique site, which provides some of the last opportunities to preserve publicly accessible open space and provide native habitat along the Arroyo Seco. The impacts of the proposed Project, measures to mitigate impacts, and alternatives to the Project must be carefully reviewed by the City, with broad public participation. We look forward to working with the City to assure that this Project and alternatives to the Project receive the careful review that they deserve.
Thank you for consideration of my views. I incorporate into the administrative record all of the documents that I cited. We request to be placed on the mailing list for any future notices and documents.

Clara Solis

APPENDIX A - HISTORIC PHOTOS OF SAN PASCUAL SITE AREA 1936 TO 1948



Photograph of the Arroyo Seco channel, looking north from a point 600 feet south of San Rafael Avenue near Rose Bowl, 1936. The channel curves from the foreground at left towards the background at right and has a small amount of water in it. In the background at right, several workers can be seen on the bank of the river. Tall trees are visible at right, while a brushy mountain is visible in the background at left.

Below 1937 photo San Pascual site, San Pascual Park and Arroyo Seco Ball field





Arroyo Seco channel, north from a point 600 feet south of San Pascual Avenue,
April 1938. Photograph of the Arroyo Seco channel, north from a point 600 feet south of San Pascual Avenue, April 1938. The concrete channel curves from the foreground to the background at left. Three men can be seen working in the cannel. A small amount of water is visible at the bottom of the arroyo. At right, unidentified machinery can be seen near the top of the channel. Mountains and tall trees arevisible in the background.



San Pascual Avenue Bridge over Arroyo Seco, ca.1939 Photograph of the new bridge over Arroyo Seco at San Pascual Avenue, replacing the wooden structure destroyed by the flood in March of 1938, ca.1939. Several boulders and small plants sit amongst the small rocks which blanket the right river bank in the foreground. The river flows from the left foreground to the right distance with the San Pascual Avenue Bridge extending over it at center and a walkway over it in the background. Electrical poles line the sides of the bridge while trees line either bank.



LOS ANGELES FLOOD CONTROL DIST. DATE 6-18-48 TIME 11:45 AM NO. 9N 47,6-B ARROYO SECO CHANNEL UPSTREAM 200' +- BELOW SAN PASQUAL PROGRESS WO 4857

San Pascual Park 1948 Historic Aerials



John “Jack” Smith
Community Forestry Advisory Committee Representative CD 14
ISA Certified Arborist WE-14264A

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101
E-mail: CMonde@cityofpasadena.net

RE: Scoping Comments for Environmental Impact Report - Arroyo Seco Water Reuse Project, regarding the palm trees at the San Pascual site

June 29, 2025

I am an International Society of Arboriculture (ISA) certified arborist. I serve as the CD 14 representative for the City of Los Angeles Community Forestry Advisory Committee.

As the representative I am often asked to look at trees. In this case, I was asked to look at the palm trees at the San Pascual Park site to see if the tree report prepared by the City of Pasadena for the Arroyo Seco Water Reuse Project was accurate. Residents had concerns that many of the trees were California Palms (Washingtonia filifera) instead of Mexican fan palms (Washingtonia robusta) as indicated in the report. California Palms (Washingtonia filifera) are native trees.

On June 28, 2025, I visited the east side of San Pascual Park which is located adjacent to Stoney Drive and San Pascual Avenue and observed the palms. I am not an expert on palm trees, but am very familiar with Mexican fan Palms (Washingtonia robusta). Most of the palms at the San Pascual site seem to have characteristics that are not normally found in Mexican fan palms (Washingtonia robusta):

- Their fronds are larger than Mexican fan palms (Washingtonia robusta)
- None of these trees were reported to be taller than 60 feet in the tree report prepared.
- Mexican fan palms lose their fronds, these palms retain them.
- The Diameter at Breast Height (DBH) of these palms is greater than those of Mexican fan palms (Washingtonia robusta)
- These palms have barrel like trunks.

- I observed sideways growth which Mexican fan palms do not have.

I suggest that the Environmental Impact Report (EIR) include an evaluation by a biologist or an arborist who specializes and is familiar with California palms (Washingtonia filifera). There are known to be California palms on Orange Grove. They are listed on the Pasadena City website at https://www.cityofpasadena.net/district6/featured-stories/the-legacy-and-challenges-of-pasadenas-trees/ where it states, “Orange Grove Boulevard, where the Rose Parade begins, is lined with California’s native palm, the Washingtonia filifera,”

The EIR should explore the history of how these trees were introduced to this location and when. According to residents there are photos that appear to show the palms in this location in as far back as 1937.

Thank you for the opportunity to provide these comments.

Jack Smith,
Community Advisory Committee Representative, CD 14
ISA Certified Arborist WE-14264A

Appendices

PROJECT: SP-3: Arroyo Seco Channel Naturalization

PROJECT LOCATION

City: South Pasadena / Los Angeles

Neighborhood: N/A

Site Identification: Arroyo Seco Channel

Site Owner: Los Angeles County Department of Public Works

PROJECT DESCRIPTION

Project Type: Channel Naturalization

Project Scope: Habitat Restoration

Project Overview: The Arroyo Seco is wide and surrounded by open space for a small stretch between the 110 Freeway bridge to the north and the York Street Bridge to the south in South Pasadena / Los Angeles. Even during storm events, flow velocities are lower here due to the width of the channel. It may be feasible to remove the concrete channel or channel bottom in this stretch, producing a restored stream reach in the midst of urban Los Angeles / South Pasadena.

Project Rationale: High potential for Arroyo Seco naturalization, and consistent with surrounding land uses.

PROJECT DETAILS

Project Component	Component Letter	Type	Size (acres)	Score	Cost
Explore restoration feasibility	A	HR			$100K
Remove channel / channel bottom, restore natural conditions	B	HR	10		$1M - $5M
Explore possibility of reintroducing arroyo chub (but only in concert with restoration of golf course stream, to provide refuge from high flows)	C	HR			TBD
Total					**$5M+**

HABITAT DETAILS

	AC	CQ	OT	ST	YW	Total Score
Restoration scores	1	0	0	0	2	3

Rank (out of 22 projects): 8
Rank in South Pasadena (out of 2 projects): 1

PROJECT AREA PHOTOGRAPH



From:
Sent: Monday, July 14, 2025 10:07 AM
To: Monde, Christina <CMonde@cityofpasadena.net>; Maue, Brent <bmaue@cityofpasadena.net>
Subject: Additional Comments - Arroyo Seco Water Reuse Project Scoping Comments For the Environmental Impact Report

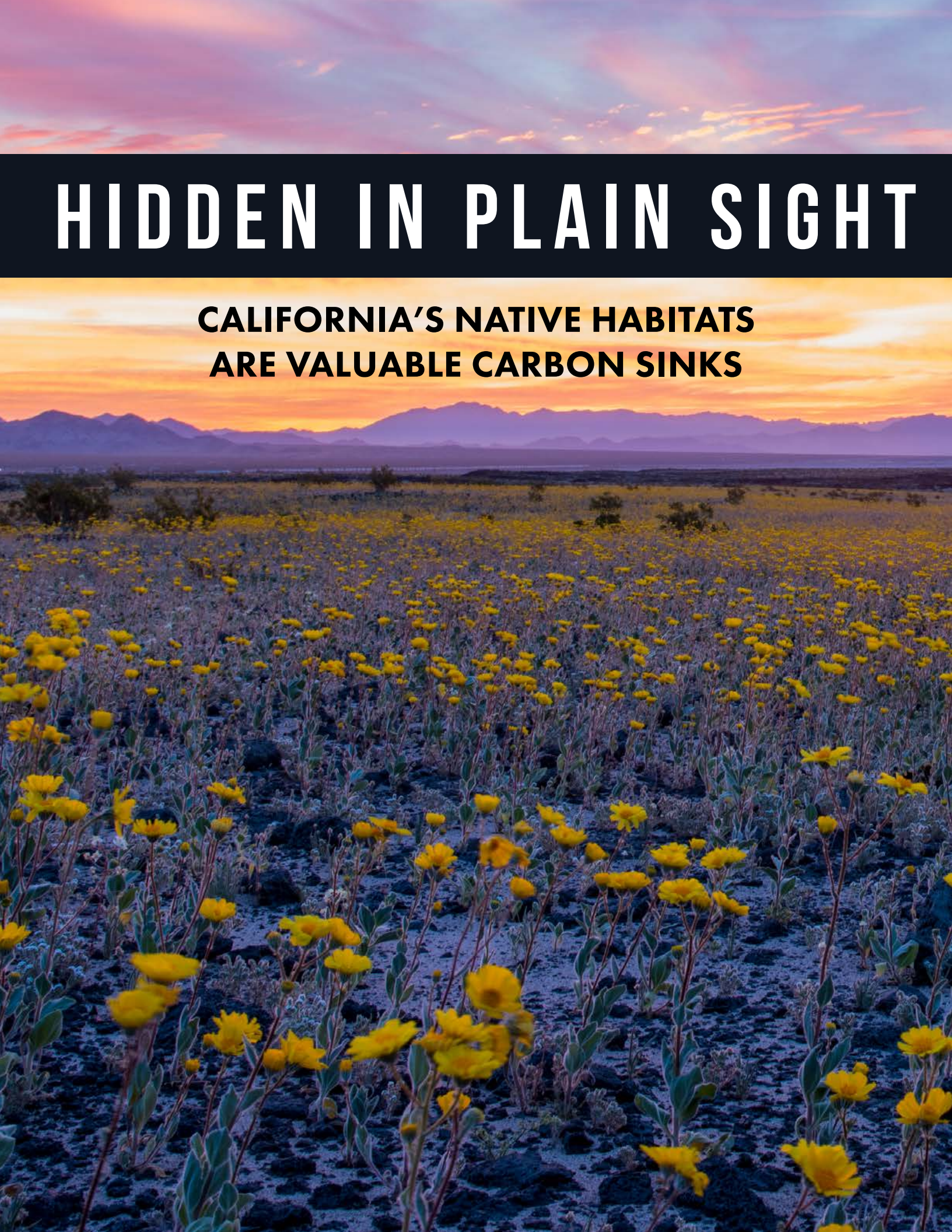
This report by the Center for Biological Diversity: Hidden in Plain Sight, California's Native Habitats Are Valuable Carbon Sinks should be considered and studied along with the ramifications for releasing green house gases and removing beneficial carbon sinks during a climate crisis. https://www.biologicaldiversity.org/programs/urban/pdfs/Hidden-in-Plain-Sight-report.pdf

Green house Gas emissions should not be underestimated in the EIR. Additionally, the benefits from keeping the riparian habitat and trees should be quantified in the EIR. See below from the Executive Summary:

Shrublands, grasslands, deserts and riparian corridors store and sequester large amounts of carbon. Yet, even when significant new development projects are analyzed through the California Environmental Quality Act, the resulting carbon emissions from bulldozing habitat are too often left out or are grossly underestimated. Such analyses often inappropriately focus on the lost carbon storage and sequestration of trees that would be destroyed while ignoring or underestimating carbon loss from other ecosystems.
Consequently, proposed mitigation for a project's GHG emissions is often insufficient and ignores opportunities to combat the climate crisis that could help local communities. Most nature-based mitigation efforts for development projects involve so-called carbon credit programs that prioritize faraway forests or tree-planting programs that are flawed and not based on science.

HIDDEN IN PLAIN SIGHT

CALIFORNIA'S NATIVE HABITATS ARE VALUABLE CARBON SINKS



HIDDEN IN PLAIN SIGHT

CALIFORNIA'S NATIVE HABITATS ARE VALUABLE CARBON SINKS

A report by the Center for Biological Diversity:
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JULY 2023

Cover photo: Amboy Crater
Title page photo: Russian Ridge Open Space Preserve

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Fort Ord National Monument

EXECUTIVE SUMMARY

California is at the forefront of the climate crisis. Poor land-use planning and extreme weather events have led to an onslaught of disasters harming communities and threatening the state's ecosystems. Strategies that maximize the carbon storage and sequestration of trees and forests are important to fight climate change. But **policymakers are ignoring other nature-based conservation strategies that are right in front of us**.

This report details the carbon sequestration value of California's most overlooked habitats and highlights conservation and science-based mitigation strategies that are crucial in fighting the climate crisis. It shows:

- Many tree-planting and other carbon offset programs are deeply flawed. They do not achieve the promised carbon storage gains and can unintentionally harm ecosystems and communities.
- Many at-risk diverse habitats of California — including shrublands, grasslands, deserts and riparian corridors — are significant carbon sinks.
- The benefits of preserving California's overlooked habitats go beyond carbon storage and sequestration. It protects biodiversity and Tribal resources, keeps communities safer from wildfire risks and offers more equitable access to open space.
- Our key recommendations for policymakers are to conduct more accurate accounting of carbon storage, prioritize habitat conservation and make smarter land-use decisions.

Shrublands, grasslands, deserts and riparian corridors store and sequester large amounts of carbon. Yet, even when significant new development projects are analyzed through the California Environmental Quality Act, the resulting carbon emissions from bulldozing habitat are too often left out or are grossly underestimated. Such analyses often inappropriately focus on the lost carbon storage and sequestration of trees that would be destroyed while ignoring or underestimating carbon loss from other ecosystems.

Consequently, proposed mitigation for a project's GHG emissions is often insufficient and ignores opportunities to combat the climate crisis that could help local communities. Most nature-based mitigation efforts for development projects involve so-called carbon credit programs that prioritize faraway forests or tree-planting programs that are flawed and not based on science.

Offset programs are massively failing to accomplish the proclaimed carbon storage gains or forest protections. Since its inception in 2013, California's cap-and-trade program has over-credited developers, corporations and governments for forest carbon offset programs by an estimated 30 million tons of carbon dioxide equivalents. These shortcomings are valued at an estimated $410 million in 2021 market prices.

To address the climate crisis in a meaningful way, we must not only protect forests but also recognize the carbon storage and sequestration power of California's other important ecosystems. The U.N. Intergovernmental Panel on Climate Change estimates that the world needs to cut 48% of GHG emissions by 2030 and achieve net zero carbon emissions by the early 2050s to limit global temperature rise to 1.5 degrees Celsius and avoid the worst damages of the climate crisis. In addition to rapidly phasing out fossil fuels, scientists point to nature as an effective and efficient tool to help limit warming by storing and sequestering carbon.

California's nonforest habitats play an unappreciated but critical role. As with forests, nonforest habitats can store carbon by keeping it from being released and sequester it by removing it from the atmosphere.

Habitats in arid and semi-arid regions — including shrublands, grasslands, and deserts — have been found to store significant amounts of carbon while being resilient to drought and increased atmospheric carbon. Grasslands may appear unimpressive aboveground, but belowground native grasses can store as much or more carbon as trees. Riparian habitats meanwhile can store and sequester substantial carbon while providing a cooler microclimate for species to find refuge. These habitats near rivers and streams also increase water infiltration and groundwater replenishment, and they facilitate species movement as ranges shift with a changing climate.

California shrublands, grasslands, deserts, and riparian corridors cover and connect vast areas of the state while supporting high levels of biodiversity and endemism. Collectively they play an integral role in the carbon cycle. Their preservation would not only aid in combatting climate change through their role as natural carbon sinks but also benefit local communities by providing much needed access to nature and bring the state closer to California Gov. Gavin Newsom's 30 by 30 executive order to conserve more than 30% of its lands and coastal waters by 2030.



Joshua Tree National Park
by Joan Amero



Wildfire damage in Santa Rosa by Bay Area Media Masters

CLIMATE CHANGE IS ALREADY HERE

Human-caused climate change is bringing widespread harms to animals and plants. Hundreds of species have experienced climate-related local extinctions[1] and 82% of key ecological processes have been affected by climate change.[2] If climate change continues unabated, more than one-third of all plant and animal species could become extinct in the next 50 years.[3]

Climate change is also causing widespread harms to human communities around the world. California has experienced extended drought and mass flooding simultaneously[4], along with a longer fire season, larger areas burned and more community destruction by wildfires.[5–7] Flooding due to sea-level rise has led to severe property damage and social disruption in the Pacific Islands.[8] Drought and saltwater intrusion in the Mekong River Delta in Vietnam are affecting rice production and livelihoods.[9] Severe drought and famine are affecting millions in Eastern Africa[10] while people in Nigeria are inundated with floods.[11] Recent record heatwaves across the globe have caused thousands of deaths, driven unprecedented wildfires, and impaired critical infrastructure, like airport runways, streetcar power cables, and rail lines.

There is a palpable urgency to take immediate, aggressive action to combat climate change.

TREE-PLANTING PROGRAMS AND CARBON OFFSETS ARE INEFFECTIVE

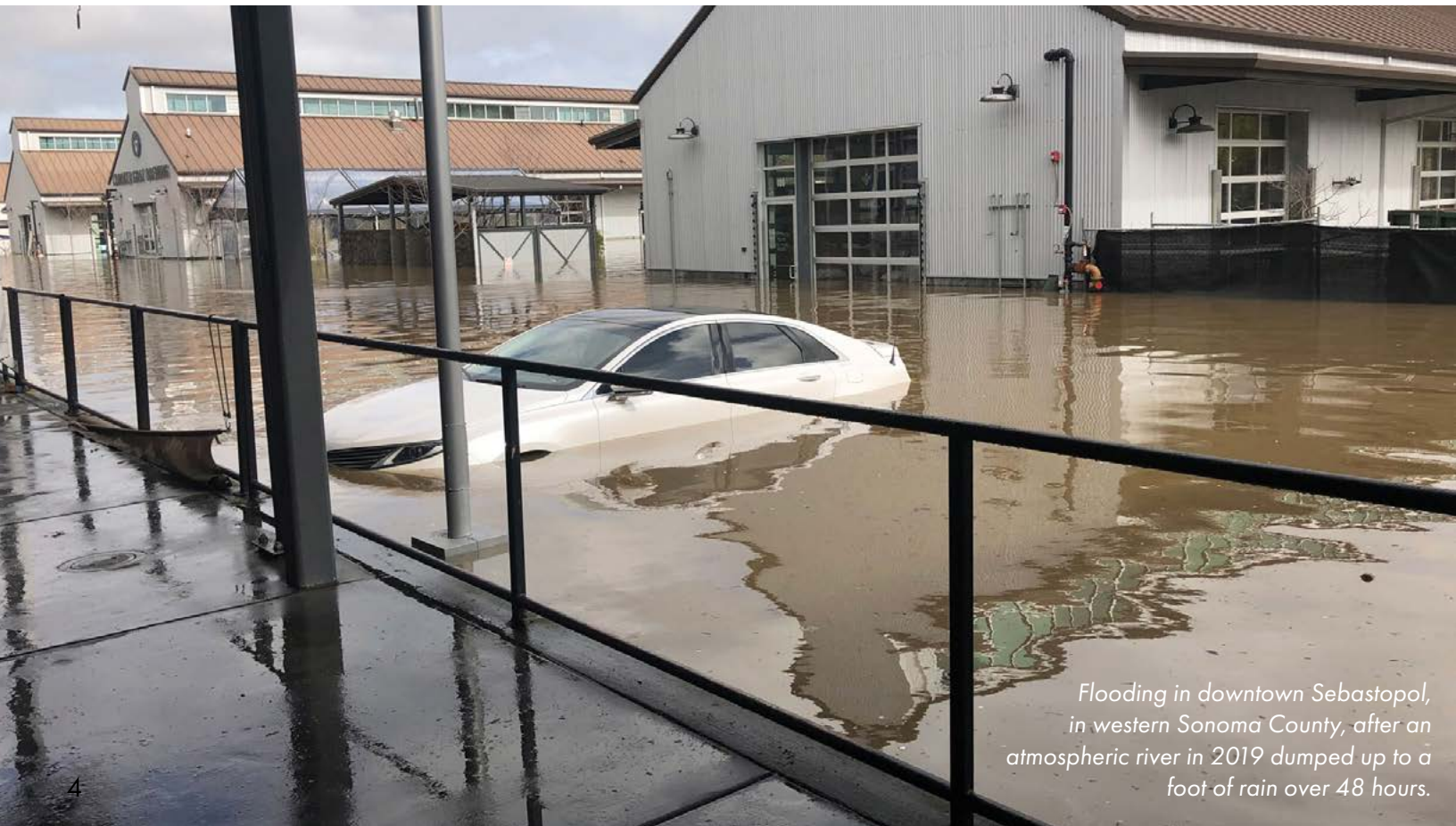
Most nature-based mitigation efforts for a development's greenhouse gas emissions involve so-called carbon credit programs that prioritize faraway forests or tree-planting programs. Although trees and forests store the largest percentage of carbon compared to other terrestrial ecosystems,[12] such approaches are often inadequate and ignore additional opportunities to combat the climate crisis while helping local communities.

Tree-planting programs are often used to "offset" GHG emissions resulting from a corporation's polluting activities. "Offsets" or "carbon credits" allow corporations to fund projects to remove the same amount of carbon from the air as that which is produced by the polluting activity elsewhere. Examples of popular offsets include building renewable energy systems, upgrading to waste and landfill management, methane abatement, fuel switching, improving energy efficiency, reforestation and tree-planting. Offsets vary from voluntary efforts by a corporation's marketing campaign to mandatory mitigation measures under regulatory or permitting requirements (See California Health & Safety Code § 38562).

Many governments and businesses are quick to tout their tree-planting contributions, but the actual amount of reduced carbon emissions can vary greatly based on the reliability, enforceability, monitoring and longevity of the offset program.[13] The success of the program also depends on whether there is an actual reduction in emissions or if those reductions would have occurred anyway.

Large-scale tree-planting initiatives around the world in the past 50 years have not led to the promised carbon storage or sequestration gains.[14] In addition to high tree mortality rates, such programs have unintentionally harmed biodiversity, water availability, wildfire severity, and the livelihoods of rural communities.[14–17] Tree planting programs can suffer from faulty accounting, manipulation and, in some instances, seizing forest stewardship away from Indigenous communities.[14,16–18]

Such programs require careful planning that includes planting appropriate tree species in appropriate locations while allowing some forests to regrow on their own. A successful program should avoid biodiversity-hindering and nutrient-depleting monoculture plantations and have a long-term adaptive management plan with accountability measures in place to ensure planted trees survive and grow.[14,16,17] Tree-planting efforts should avoid areas undergoing natural habitat regeneration, where tree-planting is unnecessary and can be ecologically harmful (e.g., post-fire clearcutting and replanting). Adequate funding and engagement with local communities are also key.[14,16,17] Unfortunately, most proposed tree-planting programs lack these important features to ensure successful carbon storage and sequestration.



Flooding in downtown Sebastopol, in western Sonoma County, after an atmospheric river in 2019 dumped up to a foot of rain over 48 hours.



Left: A coast live oak sapling resprouting four months after the 2019 Cave Fire in Santa Barbara. Photo: Bryant Baker

Having evolved with fire in California for millennia, many native plants are adaptable and resilient when it comes to wildfires, and in some cases, dependent on them. Yet developers interested in building in fire-prone areas often assume that previously burned areas are dead zones and proclaim that a tree-planting program would be adequate mitigation for a project's carbon emissions. They believe such a program would increase carbon storage and sequestration in burned areas, when in fact it can do more harm than good. Allowing ecosystems to regenerate on their own or with light-touch management would be much more effective and economical. These photos show two examples of fire resilience.



Right: Basal and epicormic resprouting of California redwoods can be seen following light-touch management. The resprouting at Big Basin State Park in Santa Cruz County is taking place two years after the CZU Lightning Complex Fire. Photo: Tiffany Yap

Carbon offsets that theoretically protect faraway forests (either within the state, within the country or abroad) to mitigate the impacts of a development or a corporation's polluting practices are also common. But research shows that many forest carbon offset projects are flawed and do not achieve the proclaimed climate benefits, nor do they result in actual forest protection.[18–22]

In California, scientists found that carbon offset projects were not sequestering enough carbon to mitigate emissions as intended, while timber companies continued logging in offset project areas that are meant to be off limits.[19] California's offset projects are often over-credited due to inaccurate assumptions that all tree species store the same amount of carbon. Less carbon-sequestering tree species and forests that are not at risk from logging are often selected to "offset" higher-quality habitat, which has led to over-crediting developers, corporations, and governments an estimated 30 million tons of carbon dioxide equivalents valuing an estimated $410 million at 2021 market prices.[23]

Also troubling are offset programs located far from the polluting activity because they shift GHG emissions reductions away from the communities and habitats harmed by the pollution. A community that now has a new freeway, warehouse logistics center or oil refinery will face worse air quality and see none of the benefits of new trees planted thousands of miles away.

Over reliance on ill-conceived offset programs, including international tree-planting efforts, undermines local and state efforts to combat the climate crisis and worsens inequity by placing disproportionate pollution burdens on low-income, minority communities where polluting infrastructure is often sited. [24]

Although forests store the largest percentage of carbon compared to other terrestrial ecosystems,[12] trees and forests need support from other habitats. About 30% of described tree species are threatened with extinction,[25] and climate change is affecting the ability of forests and trees to survive.[25–31] Higher temperatures and extended drought are making trees more susceptible to stressors like insects, disease, and wildfire.[32–35] Drier conditions are causing trees to transpire more quickly and dry out, which is reducing tree growth and forest health globally.[36–38] In addition, there is evidence in high-elevation forests that increased atmospheric carbon is leading to shorter carbon residence time in trees, with trees growing faster and dying more quickly.[30] And the carbon storage capability of tropical forests could rapidly deteriorate if global surface temperatures increase by more than 2 degrees Celsius of preindustrial levels.[39–42]

Land-use planners must urgently look to additional measures that reduce emissions and store carbon locally to increase our chances of fighting the climate crisis in an effective and equitable manner.



San Ardo Oil Fields
by Drew Bird Photography

DIVERSE HABITATS SERVE AS IMPORTANT CARBON SINKS

California has incredibly diverse natural habitats beyond forests that need to be included in the conversation about natural solutions to combat the climate crisis. Habitats like shrublands, grasslands, deserts, and riparian habitats offer vast opportunities to effectively sequester carbon. (Figure 1). Yet these habitats are often excluded from carbon calculations and neglected as important carbon sinks.

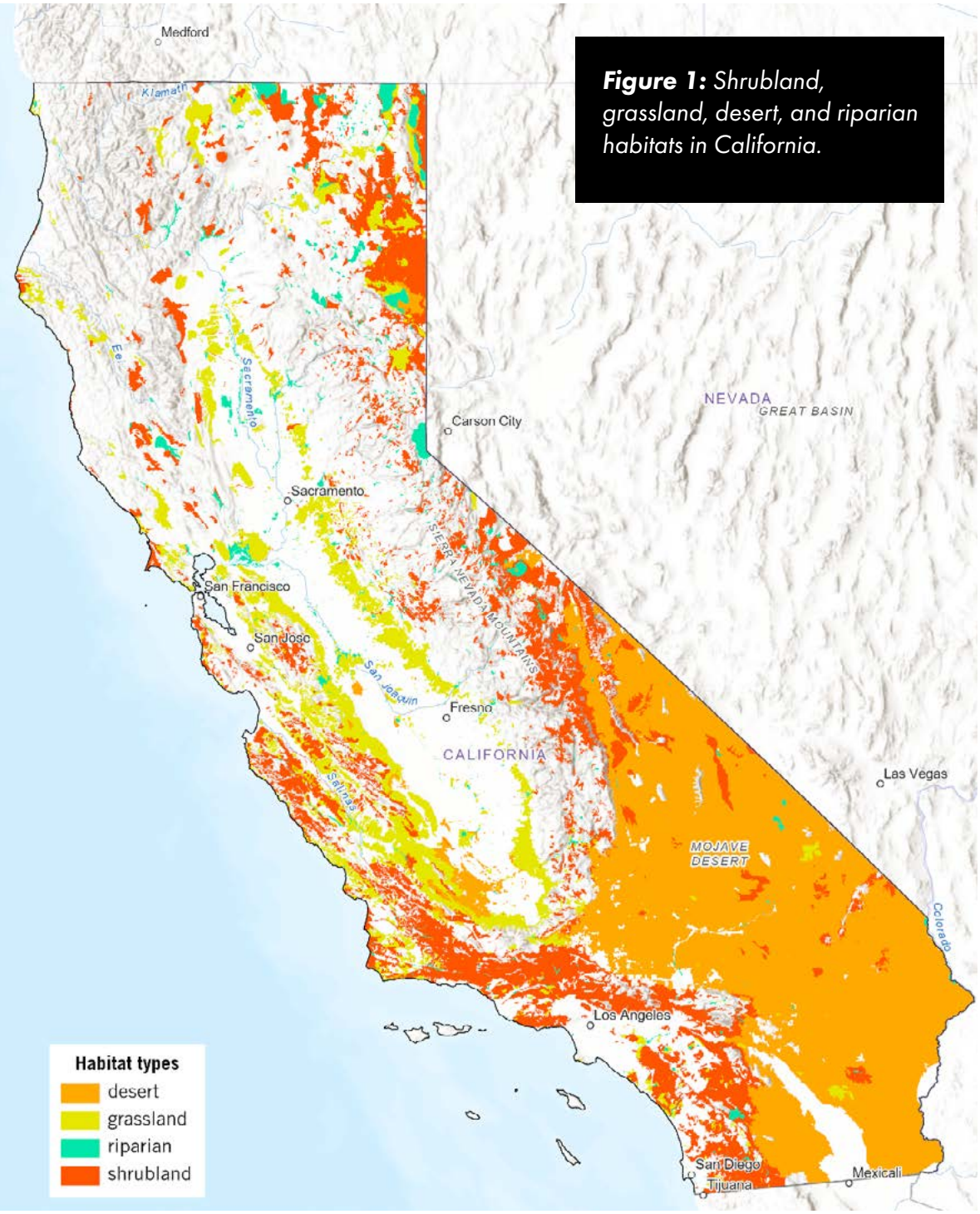


Figure 1: *Shrubland, grassland, desert, and riparian habitats in California.*

Note: For clarity purposes, the map does not include woodland habitats that often have grasslands as a large part of their understory, like blue oak woodlands and Douglas fir woodlands. Woodland habitats would fill in more of the foothills, particularly between the Central Valley and the surrounding mountain ranges. Data source: California Department of Fish and Wildlife's California Wildlife Habitat Relationships Model (2019).



Coastal sage scrub in Charmlee Wilderness Park by Ileene Anderson

SHRUBLANDS

Shrublands in Mediterranean climates, such as vegetation communities dominated by chaparral and coastal scrub, support high levels of plant and animal diversity, including sensitive species like coastal California gnatcatchers and *Ceanothus* species. They also cover a large portion of the state (Figure 1) and store a significant amount of carbon in their aboveground and belowground biomass, leaf litter, and soils[43–47] (see Appendix for details).

Researchers found that mixed chaparral and chamise chaparral in California stored an estimated 34.1 and 22.5 metric tons of carbon per acre, respectively[43,48] (Table 1). They were found to have an average carbon sequestration rate of 0.45 to 1.7 metric tons of carbon per acre, per year, and the amount of carbon stored and sequestered increased with the age of the shrubs.[43,47] Although the data vary by age of the shrubs and fluctuate based on varying environmental conditions, these statistics represent the carbon storage and sequestration potential of these habitats (see Appendix for details).

To provide some perspective, natural forests in Oregon and Northern California have been estimated to store an average 48.6 (ranging from 26.3 to 76.9) metric tons of carbon per acre with a sequestration rate of 1.21 to 3.16 metric tons of carbon per acre, per year[49] (Table 1). Estimations of carbon stored in urban trees in California cities range from an average 3.3 to 6.2 metric tons per acre with an estimated sequestration rate of 1.3 to 2 metric tons per acre, per year.[50] Similar to shrublands, stored and sequestered carbon was greater with mature forests and trees.



Coastal California gnatcatcher



Hairy Ceanothus (Ceanothus oliganthus) flowers by Ileene Anderson

***Table 1**: Carbon storage and sequestration of different habitat types in California. See Supplemental Table in Appendix for more details.*

Habitat Type	Average Carbon Storage (metric tons/ acre)	Average Carbon Sequestration Rate (metric tons/acre/ year)	Carbon Sink	References
Riparian Habitat*	325.7	0.81	total biomass, soil (50 cm deep)	[51]
Native Grasslands	59.5 – 71.2	2.18 – 5.58	soil (50 cm deep)	[52]
Shrublands	22.5 – 34.1	0.45 – 1.7	total biomass, leaf litter, soil (100 cm deep)	[43]
Rangelands	15.8 – 23		soil (40 cm deep)	[53]
Desert ***	4.17	0.4 – 0.51	total biomass, soil (1 m deep)	[54–56]
Natural Forest ***	48.6	1.21 – 3.16	total biomass	[49]
Urban Trees	3.3 – 6.2	1.3 – 2	total biomass	[50]

*Only maximum estimates of carbon storage and carbon sequestration rates are provided. Estimates include carbon in channel, flood plain and upper bank.
**Estimates are based on measurements taken in the northern Mojave Desert in Nevada.
***Estimates include forests in Northern California and Oregon.

These statistics are not strictly comparable since shrubland estimates include aboveground and belowground carbon, leaf litter and soil carbon while the natural forest and urban tree estimates only considered tree biomass. However, the numbers indicate the untapped potential of shrublands for carbon storage and sequestration in the fight against climate change.

Mediterranean shrublands may also provide resilience to climate change. They are adapted to hot and dry weather conditions in water- and nutrient-limited environments and have been found to be resilient to drought.[46,57]

Although there is some uncertainty with climate change,[i] it is clear that shrublands can provide significant carbon storage and sequestration. Given their vast distribution in California and their potential resilience to changing environmental conditions, preserving local shrublands instead of planting trees or focusing on faraway forest offsets is an effective pathway to improve our ability to stave off the worst-case scenarios of climate change while protecting biodiversity.

[i] As with forest ecosystems, shrubland carbon storage and sequestration capacity can fluctuate, and impacts of climate change are uncertain. For example, during drought the carbon sequestration capacity of Mediterranean shrublands has been observed to decrease,[45] and they can even become a carbon source.[46] Elevated atmospheric carbon dioxide levels have been shown to enhance photosynthesis and aboveground production and increase belowground carbon pools in chaparral by stimulating root and mycorrhizal growth,[143,144] though aboveground gains were only observed in years with above-average rainfall and it is possible that gains in carbon storage could be offset by increased decomposition activity and/or respiration by soil microbes and mycorrhizae during warmer and drier conditions.[143,145]



Purple needlegrass, native to California, has roots that extend up to 20 feet deep. Oak woodlands are in the background. Photo: Ileene Anderson

GRASSLANDS

Grasslands cover about 10% of California's land area[58] (Figure 1). California's grasslands are varied and geographically unique, whether they occur in coastal prairies, desert or the central valley, which was once dominated by valley grasslands.[59,60] Originally these grasslands were primarily dominated by native perennial bunch grasses including bluegrasses and needlegrasses with a component of annual forbs, typically wildflowers. European contact initiated a transformation in California grasslands to nonnative annual grasses and forbs of Mediterranean origin including brome grasses, storksbill and clovers. These areas are often referred to as rangelands or grazing lands. Significant amounts of coastal prairie and valley grasslands have been converted to agriculture.[59,60]

Although grasslands are mostly dominated by nonnative plant species, they continue to be biodiversity hotspots. California grasslands support almost 90% of state-listed rare and endangered species and 75 federally listed plants and animals, including California tiger salamanders, burrowing owls and a variety of small herbivorous mammals.[58]

Their aboveground biomass may not be as impressive as forests or shrublands, but there is significant potential for carbon storage in their roots[52,61–64] and soils[65–67] (Figure 2). Although it depends on the species and ecological region, grasslands have been found to have large amounts of their biomass below ground.[61,62] And grasslands with higher plant diversity have been found to facilitate greater soil carbon storage and are likely more resilient to climate change.[57,62,65,68–74]

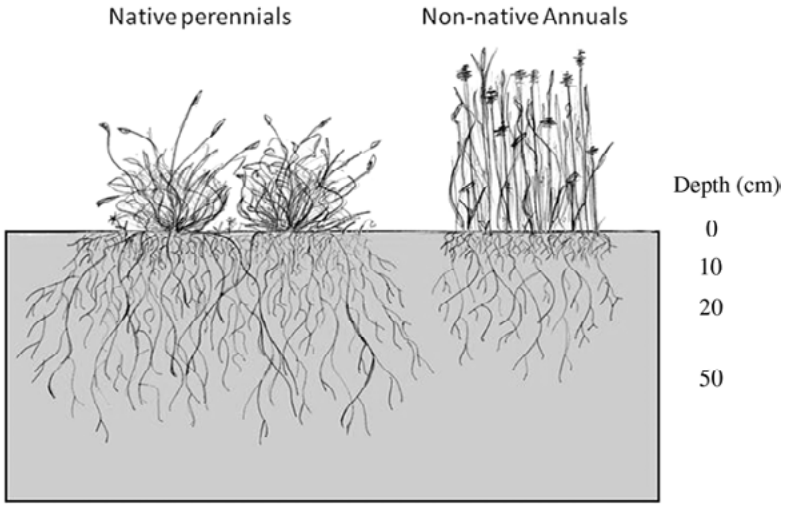


Figure 2: *California native perennial and nonnative annual grasses. Grass morphology at the time of peak biomass in spring in the native perennial grass community, left, and nonnative annual grass community, right.*
Source: Koteen et al. (2011)[52]



Tuolumne Meadows by Mark Turner

In a recent statewide analysis in California, researchers estimated there are 15.8 to 23 metric tons of carbon per acre in soil organic carbon stocks (40 cm deep) in grasslands and grazing lands[53] (Table 1). The study was based on data collected in the San Joaquin Valley, Sacramento Valley, and Central Coast.[53] The reasons for such high variability in carbon stocks are unclear, though some variation could be due to climate, region, and differences in historical and current land use.[53]

Carbon storage estimates can vary depending on the species make-up and/or condition of the site. For example, in a study conducted in Northern California, native grasslands were found to store, on average, 59.5 to 71.2 metric tons of carbon per acre in their soils (50 cm deep) with a sequestration rate of about 2.18 to 5.58 metric tons of carbon per acre, per year[52] (Table 1). This suggests that despite the relatively small amount of aboveground vegetation of native grasslands, the amount of carbon stored in their soils could be greater than the carbon storage of total tree biomass in natural forests.[ii]

Similar to California shrublands, grasslands in semi-arid regions may be resilient to climate change because they have an adaptive capacity to drought and wildfire. Multiple studies suggest that diverse grasslands can adjust to increased drought,[57,73,74] though biodiversity declines due to drought could reduce functional stability.[75] Researchers also found that plant biomass and soil organic carbon stocks in grasslands increased with elevated carbon dioxide levels, which highlights the potential for grassland soils to store more carbon as atmospheric carbon dioxide levels rise.[76]

Although the historic fire regimes of California grasslands are not well documented, research has shown that when fires burn through grasslands, they release less carbon than woody habitats because most of the carbon they store is underground, and they can recover relatively quickly.[74,77] In fact, one study found that California grasslands may be a more reliable carbon sink than trees and forests in the face of climate change, particularly if global warming exceeds 1.7ºC above pre-industrial levels.[74] This further highlights the urgency of preserving and restoring remaining intact native grasslands and their biodiversity.

[ii] In the same study, nonnative grasslands were found to store, on average, 38.4 to 60.3 metric tons of carbon per acre in their soils (50 cm deep) and sequester an estimated 1.3 to 1.8 metric tons of carbon per acre, per year.[52] These numbers may seem to suggest nonnative grasses may have the potential to store and sequester as much or more carbon than native shrublands. However, it is important to understand the geographical and ecological context of the area in question. Multiple studies have demonstrated that the invasion and/or type-conversion of native shrublands to nonnative grasslands reduce carbon stocks.[146–148] In addition, the establishment of nonnative grasses can exacerbate wildfire issues by fueling a negative feedback loop that results in more fire and type conversion.[103] Therefore, the preservation and restoration of native grasslands and shrublands should be prioritized.



Creosote desert scrub in Joshua Tree National Park by Jose Benedicto de Jesus

DESERTS

Deserts represent one of the most undisturbed and ecologically intact biomes in the world.[78] In California, desert landscapes consist of dunes, desert scrub, sandy soil grasslands, juniper-pinyon woodlands and rock formations that cover 25% to 27% of the state (Figure 1). They host more than 2,400 native plant and animal species, including iconic Joshua trees and the Mojave fringe-toed lizard. Many species are endemic to these deserts.

Scientists estimate that globally deserts store 999 to 1,899 petagrams of carbon[79] In the United States, deserts sequester an estimated 50 teragrams of carbon per year.[80]

In the northern Mojave Desert, researchers measured an average of 4.17 metric tons of stored carbon per acre[54] and an average sequestration rate of 0.4 to 0.51 metric tons of carbon per acre, per year[55,56] (Table 1). Although this may seem low compared to other habitats and recognizing that carbon storage and sequestration is dynamic and fluctuates with environmental conditions, the vast expanse of the desert and the relative intactness of the Mojave Desert highlights their importance in the carbon cycle.

The Mojave Desert is dominated by deep-rooted shrub species, including creosote bush and white bursage, as well as many forbs, trees, grasses, and dunes. Carbon in these systems is stored in the form of soil organic carbon, soil inorganic carbon and vegetation[79,81–85] (Figure 3, see Appendix for more details).

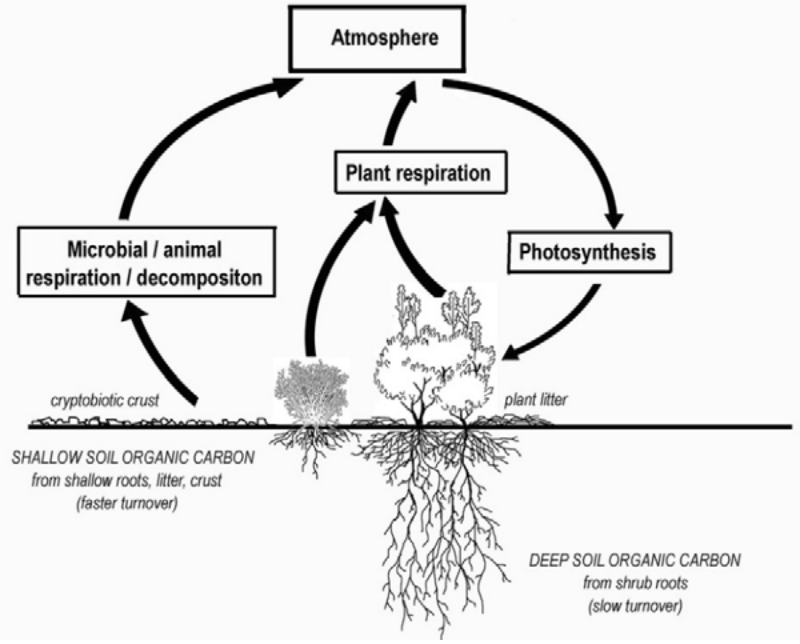


***Figure 3**: The carbon cycle in a desert ecosystem. Source: Meyer (2012)* [86]

Although aboveground productivity is low compared to less arid areas, carbon storage occurs underground as soil organic carbon in extensive root networks, soil microbial communities, and in mycorrhizae. Deserts also have deep soil organic carbon and soil inorganic carbon that can be stored as caliche.[87] Caliche is calcium carbonate ($CaCO_3$) that is formed when rainwater, carbon dioxide from soil and root microbes, and calcium react, and its stability depends on the vegetation present. Deep soil organic carbon is generally stored at depths from 30 centimeters to 1 meter where mineral interactions primarily determine the stability of stored carbon[88] (see Appendix for more details).

The desert's role as a carbon sink could become amplified as climate change worsens. Researchers noted increased carbon sequestration in soil organic carbon when carbon dioxide levels were elevated.[54,79] Field experiments in the northern Mojave desert demonstrated that desert ecosystem carbon dioxide exchange plays a much larger role in global carbon cycling and in modulating atmospheric carbon dioxide levels than previously assumed.[55]

Conservation of intact deserts is increasingly important for our carbon sequestration efforts and combatting the climate crisis.



Joshua trees and wildflowers in Joshua Tree National Park by Ileene Anderson



Mojave fringe-toed lizard by frankf/iNaturalist



Utom, also known as the Santa Clara River, is Southern California's last publicly accessible, mostly free-flowing river and supports more than 110 special-status plants and animals, including unarmored threespine sticklebacks and arroyo toads.[89] *Photo: Ileene Anderson*

RIPARIAN HABITATS

Riparian habitats consist of stream channels, vegetated floodplains and upland habitats that often include a variety of trees and shrubs, including California buckeyes, valley oaks, and arroyo willows. They support numerous wildlife, from common species, like acorn woodpeckers and Pacific chorus frogs, to species that are rarely observed in the wild, like elusive ringtails and subterranean salamanders. Riparian areas in California are key nesting areas for endangered songbirds, including the southwestern willow flycatcher, western yellow-billed cuckoo and least Bell's vireo. Riparian areas in deserts, called microphyll woodlands or dry desert wash woodlands, create important desert refugia for many animals including migratory birds.

Riparian habitats are one of many types of wetland ecosystems that support a wide range of species and ecological functions. Vernal pools, salt and freshwater marshes, wet meadows and other wetlands in California can be important carbon sinks.[90,91] However, their complexity and diversity make broad calculations about their estimated carbon storage and sequestration value challenging.

Riparian streams can flow year-round or seasonally with the rains. Although they are estimated to make up less than 0.5% of California's total land area at about 360,000 acres[92] (Figure 1), riparian habitats provide critical carbon sequestration value and resilience to climate change, particularly in arid and semi-arid regions.



Pacific Tree Frog by The High Fin Sperm Whale/Wikimedia

In Mediterranean regions, riparian habitats could be considered "carbon hotspots."[51] Riparian forests are able to store more carbon in their biomass and soils as they mature.[93,94] Scientists estimated that riparian habitats in California could store up to 325.7 metric tons of carbon per acre in their biomass and soils while accumulating about 0.81 metric tons of carbon per acre, per year[51] (Table 1). The researchers acknowledged that these estimates likely represent the upper limit of these habitats' carbon capacity.

In addition to storing and sequestering carbon, riparian habitats also allow a wide range of species to become resilient and adaptable to climate change. The canopy cover of riparian trees and the availability of groundwater have a cooling effect for both air and water temperatures, which creates a cooler microclimate for both terrestrial and aquatic species to find refuge from a warming climate.[95–97]

Riparian areas are also vital movement corridors between heterogeneous habitats for a wide variety of species, including mountain lions, toads, butterflies and birds. Such connectivity is important for animals and plants to adjust to shifts in resource availability and maintain a suitable climate space as climate change alters habitats and ecological processes.[1–3,98–100]

Their carbon capacity and their role in resiliency and adaptability to climate change makes it imperative that riparian habitats are included in carbon calculations. The preservation and restoration of riparian habitats should be prioritized.



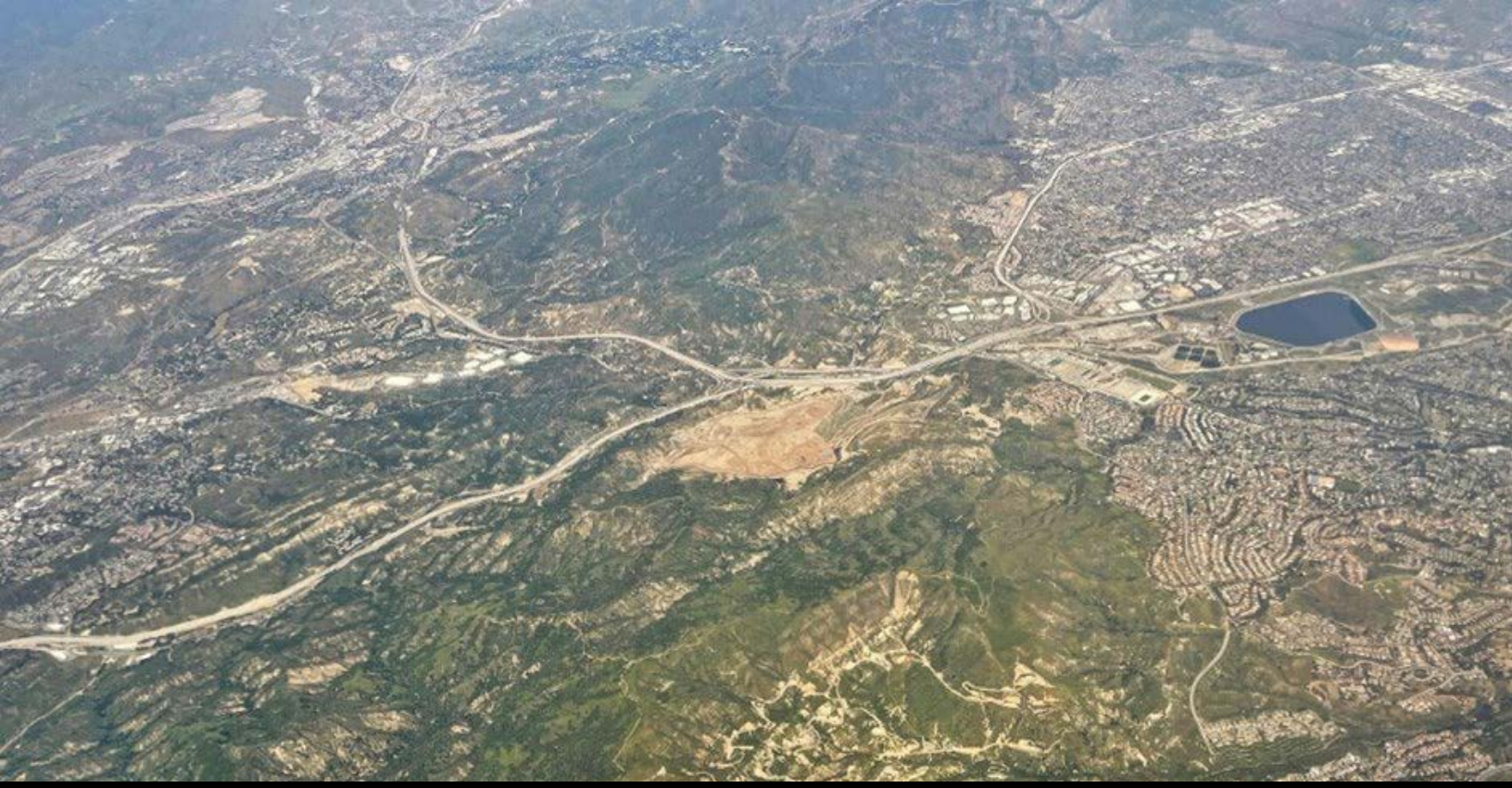
Southwestern willow flycatcher by Andrew Newmark/iNaturalist



Ringtail by Brooke Smith/iNaturalist



California buckeye by Eric Hunt



IMPORTANT CARBON SINKS UNDER THREAT

Large freeways, oilfields, warehouses, landfills and low-density residential areas are expanding into an important wildlife connectivity area in Southern California between the Santa Susana and San Gabriel mountains. Expansion into this corridor destroys habitat and releases carbon while driving the local puma population closer to extinction. Photo: Tiffany Yap

Reckless land-use decisions exacerbate climate change and threaten our ability to limit global warming to 1.5 degrees Celsius above preindustrial levels. Shrublands, grasslands, deserts and riparian habitats have enormous carbon storage and sequestration value but are often paved over without much foresight. These crucial habitats are routinely replaced with agriculture and vineyards, urban development, energy facilities, industrial mining, oil exploration, off-road vehicle recreational areas, and other uses. And local and federal governments throughout the state continue to disregard their value by approving projects that would further degrade and destroy them.

In 2019 Los Angeles County approved the 12,000-acre Centennial development, which would have destroyed more than 6,000 acres of native grasslands and wildflower fields and more than 400 acres of native shrublands. That same year the county also approved the 1,300-acre Northlake development, which would have buried 3.5 miles of Grasshopper Creek and its associated riparian habitat and more than 600 acres of sage scrub.

In 2022 Napa County re-approved the Walt Ranch vineyard development, which would have destroyed more than 100 acres of shrublands, about 84 acres of grasslands, and about 6 acres of riparian woodlands. The vineyard conversion project would have also destroyed approximately 376 acres of deciduous and oak woodlands and more than 14,000 mature oak trees. The proposed mitigation for the project's carbon emissions from the destroyed oak trees included a misguided tree-planting program to place fewer than 17,000 seedlings where many trees, chaparral, and grasslands were already recovering from a recent wildfire.

When proposed, none of these projects adequately accounted for the carbon that would be released by destroying these habitats or the loss of potential carbon sequestration when the developments would be built.

Similar destructive projects have been proposed in San Diego. In 2019 and 2020 San Diego County approved Otay Ranch Villages 14 and 13, respectively, which cumulatively would destroy more than 1,300 acres of sage scrub habitat and about 150 acres of grasslands. In 2020 Lake County approved the 16,000-acre Guenoc Valley Luxury Resort, which would destroy more than 500 acres of grasslands, more than 600 acres of shrublands, more than 13 acres of streams and hundreds of acres of other carbon-sequestering habitats like woodlands and wetlands.

As proposed these projects would not only remove important carbon sinks and destroy critical habitat for sensitive species but also increase wildfire ignition risk. Accidental human-caused ignitions are responsible for 95% to 97% of unintentional wildfires in California's Mediterranean region,[101] and the shift in historical fire regimes has led to the conversion of native shrublands and grasslands to nonnative grasses and forbs.[102–104] Such developments could lead to a negative feedback loop that would convert these high-value carbon-storing habitats to more flammable nonnative grasses with less carbon storage capacity.[iii]



Firefighters defended the neighborhood of Oak Park, surrounded by shrubland and grassland, from the 2018 Woolsey Fire. Caused by Southern California Edison electrical equipment, the fire killed three people, burned more than 96,000 acres, destroyed 1,643 structures, and caused 295,000 people to evacuate. Photo: Wendy Leung

Deserts also face an additional threat from poorly planned and ill-sited renewable energy projects, like remote solar farms. Although solar energy is an important renewable resource that reduces the need for fossil fuel extraction and lowers carbon emissions, these types of projects also destroy large swaths of intact desert ecosystems. In doing so, they release large amounts of carbon into the atmosphere while eliminating important carbon sinks and destroying essential habitat for struggling species, like desert tortoises and Mohave ground squirrels, all in the name of delivering "clean" energy and combatting climate change.

[iii] Lawsuits are ongoing for the Lake County and San Diego County projects mentioned. Following a legal challenge to Los Angeles County's decisions to approve the developments, courts ordered the approvals for the Northlake project and the Centennial project be set aside because of inadequate environmental review under CEQA. Although the Walt Ranch project was re-approved, after years of community opposition and legal challenges, in May 2023 the area was acquired and permanently protected by the Land Trust of Napa County.

Distributed solar with net-metering on existing structures reduces GHG emissions and preserves intact habitats while making energy more affordable and accessible.[105] Los Angeles County has the opportunity to generate more than 19,000 megawatts of energy by installing solar panels on 1.5 million available rooftops,[106] but instead has prioritized industrial solar farms in remote desert areas.

Desert ecosystems are also vulnerable to invasive plant species and the fire risk they bring. Human disturbance, including livestock grazing, off-highway/off-road vehicle use, fire, urbanization, roads, and agriculture, has led to the establishment of nonnative grasses and forbs in California's desert ecosystems.[107] In addition, nitrogen deposition from air pollution leads to fertilization that disproportionately benefits nonnative species, which outcompete native vegetation.

The increased biomass accumulation fuels more frequent and larger fires in desert ecosystems that rarely burned historically and are not well-adapted to extensive wildfires [108–114]. Hotter temperatures and more frequent fires favor the establishment of invasive grasses, shift the area's fire regime, perpetuate the conversion of California's desert ecosystems, and eliminate their capacity to store and sequester carbon.[107,108,110–113]

Further destruction and degradation of California's habitats will diminish our ability to effectively combat climate change. To improve our chances of limiting global warming, we must do more to protect and enhance valuable carbon sinks across diverse habitats.

The Centennial project in Tejon Ranch, Los Angeles County would develop one of California's last remaining intact native grasslands. Photo: Richard Dickey



DIVERSE HABITATS OFFER MYRIAD CO-BENEFITS

There are many co-benefits to preserving diverse habitats when mitigating GHG emissions from a harmful project. Not only does preserving heterogeneous habitats protect biodiversity and communities from wildfire risk, it also protects Tribal and cultural resources, makes our communities healthier and more resilient to climate change, provides equitable access to nature, and moves California closer to attaining its 30 by 30 goals.



American badger

BIODIVERSITY AND WILDLIFE CONNECTIVITY

Protecting and restoring diverse habitats will also help protect the state's unique biodiversity and improve habitat connectivity. Poor land-use practices have led to fragmented landscapes that harm native plants and animals by isolating populations and preventing individuals from finding food, water, shelter and unrelated mates.[115] Protecting nonforest habitat will provide sensitive species like American badgers, blunt-nosed leopard lizards, and coastal California gnatcatchers with live-in habitat, refuge, and opportunities to adjust to shifts in resource availability as climate change worsens.

EQUITABLE ACCESS TO OPEN SPACE

Preservation of remaining diverse habitats for carbon sequestration can also serve as "local offsets" and GHG mitigation opportunities that bring benefits directly to the communities harmed by the polluting activities.

Protecting existing habitats locally and increasing green space with native plants in historically marginalized communities would help facilitate equitable access to open space, which is vital for communities to experience the physical and mental health benefits of nature.[116] Studies conducted in Southern California have shown that children living closer to open space had fewer asthma emergency department visits[117] and were less likely to experience obesity[118] compared to those living further away from open space. Similarly, residents living closer to urban parks had better mental health scores compared to those living further away[119] and psychological well-being increased with increasing biodiversity in urban green spaces.[120]



Families exploring Santa Monica Mountains

The U.S.-sanctioned policy of redlining segregated and suppressed Black Americans to areas that were perceived as less desirable and had less government support. This type of structural racism, combined with poorly planned development, has resulted in highly urbanized, poorer neighborhoods where communities of color are more likely to be exposed to dangerous levels of air pollution, heat, and contaminated water.[121] These areas also have significantly less green space and biodiversity compared to predominantly white neighborhoods with more resources.[121]

Although there are some tradeoffs between housing densification and biodiversity, scientists have found that designing denser neighborhoods with creative green solutions can increase affordable and accessible housing while supporting and enhancing biodiversity.[122] Examples of science-based solutions, or green interventions, include preserving remnant habitat patches, protecting riparian corridors, requiring onsite stormwater capture, green roofs, and creating managed urban parks.[122]

TRIBAL SOVEREIGNTY AND STEWARDSHIP

Protecting diverse habitats for carbon storage and sequestration would also provide an opportunity to foster Tribal sovereignty and support Tribal stewardship on unceded ancestral lands. Numerous Tribes that have survived genocide and displacement are now working to heal the land.

In Northern California along the Klamath River, Karuk women are retraining Indigenous women on how to bring fire back to the land so they can protect their homes and families from ecological disasters, nurture plants for food and medicine, and preserve their cultures.[123] Similarly, the Amah Mutsun Tribal Band is working with California State Parks to return good fire and restore coastal prairies and healthy forests to the ancestral lands of the Amah Mutsun, Muwekma Ohlone, and Awaswas people.[124]

In 2022, the Yurok Tribe reintroduced California condors to Yurok ancestral lands in partnership with Redwoods National and State Parks.[125,126] The Karuk Tribe recently teamed up with the California Department of Fish and Wildlife and UC Berkeley to reintroduce elk to their ancestral homelands.[126,127] And the Maidu Summit Consortium and the Tule River Tribe are working to reintroduce beaver on their ancestral lands.[126,128] These species have great cultural and ecological value.



California condor



Roosevelt elk by Terry Feuerborn

Meaningful collaboration between agencies and Tribes and incorporating traditional ecological knowledge and Indigenous science in land preservation and management would synergize efforts to combat the climate crisis, increase community resilience and protect biodiversity.[126] Such efforts benefit everyone.

WILDFIRE RISK

Conservation purchases and commitments to permanently protect habitat in areas designated as "high fire hazard severity zones" in Southern California, where chaparral and coastal sage scrub are most vulnerable to development, have led to biodiversity conservation and reduced wildfire risk.[129,130] Proper land-use planning that prohibits development in intact shrubland and grassland habitats in high fire-prone areas can reduce the number of wildfires accidentally ignited by people in the wildland urban interface. Wildfire risk management saves lives while offering the co-benefits of efficiently maintaining biodiversity, facilitating carbon storage, avoiding carbon release due to habitat removal, and preventing toxic air pollution from burning structures.

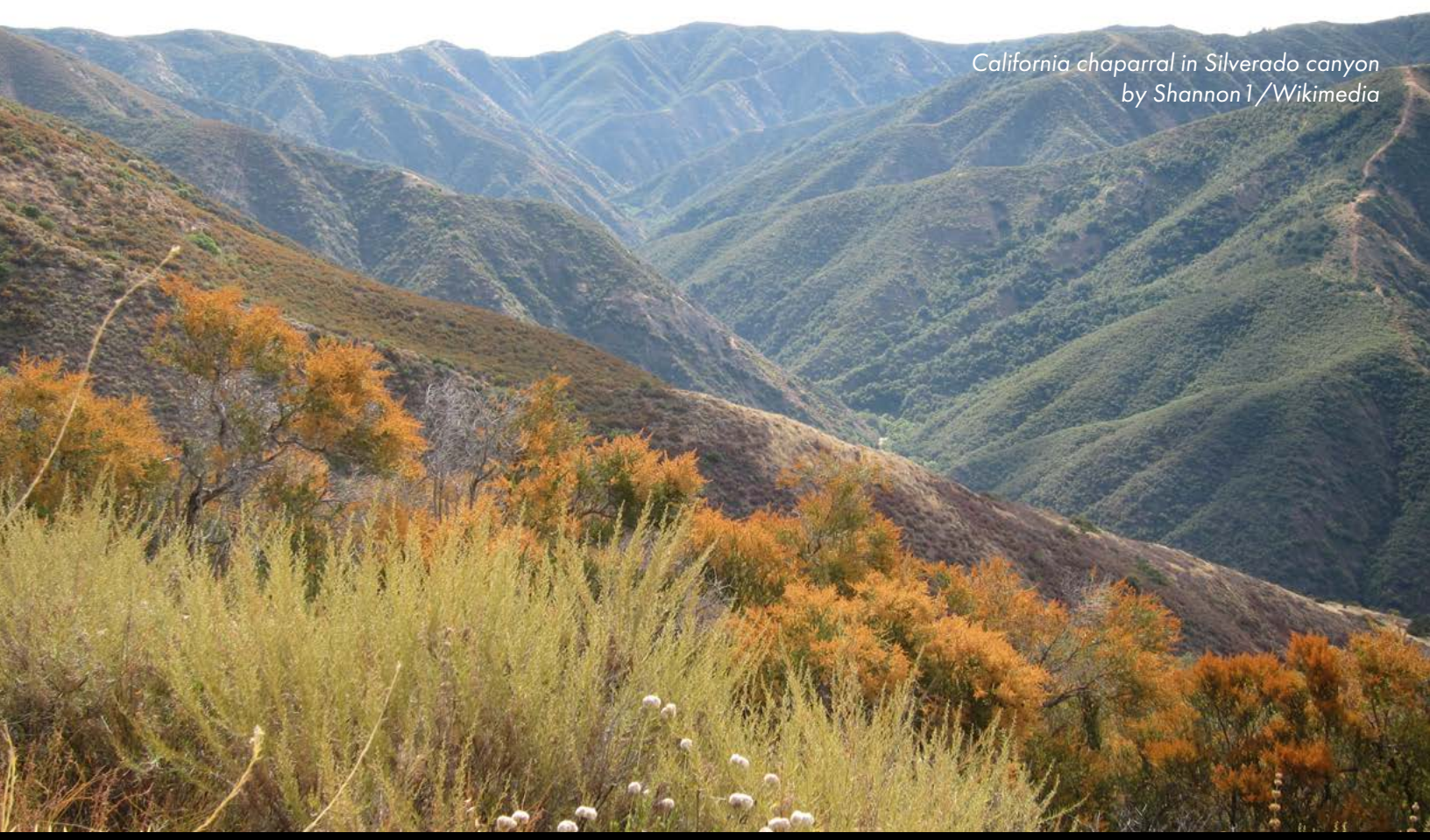
CLIMATE RESILIENCY

California's native landscapes also help make communities more resilient to climate change by helping to regulate our climate, purify our air and water, pollinate our crops, and create healthy soil. These habitats, along with properly designed and managed urban green spaces, can help ameliorate the impacts of heat waves, flooding and wildfire.[131–134] And when properly designed and managed, urban green space can potentially reduce energy use and associated costs.[135]

The preservation and enhancement of diverse habitats in California offer many direct and indirect benefits to wildlife and people. These benefits emphasize the need to account for these habitats as critical carbon sinks and incorporate their protection as mitigation for GHG emissions.



Griffith Park, Los Angeles
photo by diliana/Flickr



California chaparral in Silverado canyon by Shannon1/Wikimedia

RECOMMENDATIONS FOR SEQUESTRATION STRATEGIES

Nonforest habitats present an additional nature-based opportunity to strengthen our fight against climate change. At a minimum, strategic land-use planning should prioritize the following:

- Ensure that during the project approval process, policymakers fully consider the climate impacts from habitat loss. If environmental review under CEQA or other applicable environmental laws is required, it should include comprehensive and accurate accounting of the carbon storage and sequestration loss from the destruction of diverse habitats. When habitats are paved over for development, carbon calculations should include the loss of currently stored carbon as well as potentially sequestered carbon if the habitats were to remain.
- Promote the conservation and restoration of existing intact, connected, heterogeneous habitats (to be managed by local stakeholders, including Tribes) as a viable mitigation strategy for reducing GHG emissions. Prioritize such mitigation over ambiguous carbon "offsets" in faraway places so that local communities affected by the proposed projects are appropriately compensated.
- Discourage tree-planting schemes that replace nonforest habitats with tree plantations. Instead, prioritize the preservation and restoration of local habitats, especially in and near polluted communities, and incentivize the planting of appropriate vegetation with appropriate management in urban areas that lack green space and in communities that have been historically excluded and underserved.
- Incentivize more research on the carbon storage and sequestration capacity of diverse habitats. This report provides regional and statewide estimates of the carbon storage contributions from shrublands, grasslands, deserts and riparian habitats. However, there is great diversity within habitats that must be considered when calculating carbon impacts and offsets. As more research is conducted and new information is made available, we can deepen our understanding of the carbon cycle and how nature-based solutions can help combat climate change.

To ensure that the implementation of such strategies is successful, the following mitigation standards are recommended:

- Prioritize protecting and managing connected, intact habitat in perpetuity. When habitat conservation is used as a mitigation measure, such land should be vulnerable to development so that true carbon storage gains are made. High replacement ratios should be used to ensure a net gain of habitat. Funding should be allocated for long-term monitoring, reporting, and adaptive management with measurable performance criteria. Extractive uses, such as mining, fossil fuel extraction, logging, livestock grazing, agriculture, energy development, and off-road vehicle recreation, should not be allowed in conservation areas.
- Prioritize conservation easements and avoid development in high fire hazard severity zones and flood zones.
- Prioritize the restoration and enhancement of degraded habitats and abandoned agricultural lands to store and sequester more carbon.[62,136] With the passing of the Sustainable Groundwater Management Act in 2014, it is estimated that 500,000 to 1 million acres of agricultural land in the San Joaquin Valley will need to be retired within the next 20 to 30 years to bring groundwater basins into balance.[137,138] California has an opportunity to retire agricultural lands for shrubland and grassland restoration. Doing this strategically will increase carbon storage, reduce air pollution, increase water reliability during drought and support biodiversity that facilitates improved ecosystem function and climate change resilience.[139–142]
- Meaningfully collaborate with Tribes and incorporate traditional ecological knowledge and Indigenous science to re-establish historical fire regimes and adaptively manage ecosystems.
- If GHG emissions reductions from protecting habitat are used for meeting regulatory or permitting requirements, ensure that mitigation measures are real, permanent, quantifiable, verifiable and enforceable. There should be evidence that shows the GHG emissions reductions would not have occurred in the absence of mitigation measures. Similarly, the GHG emissions reductions must be irreversible.

Tree-planting and carbon offset schemes are not the answers to the climate crisis. If we want to take meaningful climate action, we must make smarter land-use decisions that value the carbon storage and sequestration abilities of not only trees and forests, but also California's overlooked shrublands, grasslands, deserts and riparian corridors. As California communities grow, we must mitigate harmful developments with a sound plan that brings real results. Preserving and restoring the native habitats of this golden state protects our rich biodiversity, benefits communities, and gives us a fighting chance to tackle the climate crisis.



South Fork Kings River in Sequoia-Kings Canyon Wilderness by Tiffany Yap

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APPENDIX

There is great diversity within habitats that must be considered when calculating carbon impacts and offsets. Yet existing tools used to calculate carbon losses from destroyed habitat are often insufficient and incomplete. Miscalculations relying on these tools can, for example, underestimate the loss of carbon storage and sequestration from removing native grasslands or shrublands while also leading to systematic over-crediting in California's carbon offsets program.[1] Therefore, it's essential to carefully examine and analyze site-specific carbon storage and sequestration.

This report provides regional and statewide estimates of the carbon storage contributions from shrublands, grasslands, deserts and riparian habitats. There are many ways carbon can be stored in ecosystems.[i] Carbon can be stored in aboveground biomass of living and dead plants, belowground root systems, soils, and leaf litter. This appendix provides additional information and discussion regarding how carbon is stored in various habitats. Accounting for the various carbon sinks within an ecosystem is important when calculating carbon loss from habitats that are bulldozed for development.

The Supplemental Table provides a more detailed summary of the available data in the scientific literature regarding carbon storage and sequestration in shrublands, grasslands, desert, riparian habitats, natural forests and urban trees in California. Although there are gaps in the data that make it difficult to directly compare the habitats, the available information reflects the untapped carbon potential of several nonforest habitats in the state.

Climate science is a growing and dynamic field. Some habitats have more information than others. As more research is conducted and new information is made available, we can deepen our understanding of the carbon cycle and how nature-based solutions can help combat climate change.

[i] Some scientists are even looking into the recovery of baleen whales as a carbon sequestration strategy.[31]



Owens Peak Wilderness

Supplemental Table: *Carbon storage and sequestration of different habitat types in California.*

Habitat Type	Age (years)	Average Aboveground Biomass (metric tons/acre)	Average Belowground Biomass (metric tons/acre)	Average Soil Carbon (metric tons/acre)	Soil Depth (cm)	Average Leaf Litter Biomass (metric tons/ acre)	Estimated Average Total Carbon Storage (metric tons/ acre)	Estimated Annual Carbon Accumulation (metric tons/ acre/year)	Ref.
Riparian Habitat[a]	1-45	233.8	51.6	40.2	50			0.81	[2]
Channel		61.8	14						[2]
Floodplain		92.9	20.1	17.5	50			0.35	[2]
Upper Bank		79.1	17.5	22.7	50			0.45	[2]
Grasslands									
Dominated by *Agrostis halli* (native species)		1.34 - 1.7	0.85 - 1.66	71.2	50		71.2[b]	2.18 - 3.36	[3]
Dominated by *Festuca rubra* (native species)		1.41 - 1.5	2.02 - 4.09	68.4	50		68.4[b]	3.44 - 5.58	[3]
Nassella pulchra, *Bromus carinatus*, *Elymus glaucus* mix (native species)		1.05 - 1.05	1.5 - 3	59.5	50		59.5[b]	2.55 - 4.05	[3]
Non-native Grasslands		0.49 - 1.13	0.57 - 0.81	38.4 - 60.3	50		38.4 - 60.3[b]	1.05 - 1.94	[3]
Rangelands				15.8 - 23	40		15.8 – 23[b]		[4]
Shrubland									
Mixed Chaparral	1 - 30+	14	5.38	5.66	100	10.3	35.3	1.73	[5,6]
Chamise Chaparral	1 - 30+	8.55	5.13[c]	3.65	100	5.17	22.5	0.45	[5,6]
Coastal Sage Scrub	1 - 10+	6.4				5.63			[5,6]
Desert							4.17[d]	0.4-0.51[d]	[7–9]
Ceanothus greggii (desert shrub)	21 - 24	19.7	3.23					2.41	[5]
Natural Forest[e]							48.6	1.21 - 3.16	[10]
Urban Trees[f]							3.3 - 6.2	1.3 - 2	[11]

a Only maximum estimates of carbon storage and carbon sequestration rates are provided.
b Only includes average soil carbon because average biomass data was provided as a range.
c Calculated based on the 0.6 shoot:root ratio provided for chamise (*Adenostoma fasciculatum*) in Bohlman et al. (2018).
d Estimates are based on measurements taken in the northern Mojave Desert in Nevada.
e Estimates include forests in Northern California and Oregon, only includes total tree biomass.
f Only includes total tree biomass.



Coastal scrub by Ileene Anderson

SHRUBLANDS

California chaparral is primarily made up of evergreen woody shrubs that create a dense, semi-impenetrable cover. It occupies most of the hills and lower slopes of California and is adapted to drought and fire.[12] Long-duration cycles of fire and regrowth sustain the various successional stages of chaparral communities. It also fixes carbon throughout the year with summer and winter depressions.[12]

Named for its preference for the entire coast of California, typically within the fog-drip zone, coastal scrub is occasionally referred to as "soft chaparral" because the shrubs are shorter, less robust, and have a shallower root zone.[13,14] Unlike chaparral, coastal scrub shrubs are typically drought deciduous, which means they lose leaves during the dry season, adding biomass during the rainy season. With this strategy, the majority of the carbon uptake occurs during the rainy season.[13,14]

Aboveground biomass consists of both live and dead vegetation. Even dead vegetation, like stands of shrubs or trees killed during a wildfire, can still serve to store carbon, and some plants can resprout after fire. Researchers found that carbon in above-ground biomass of shrub communities, including mixed chaparral, chamise chaparral, and coastal sage scrub, ranged from 0.49 to 47.7 metric tons of carbon per acre and averaged 6.4 to 14 metric tons of carbon per acre (Supplemental Table).[5,15]

Although researchers found that the amount of carbon stored in shrub communities increased with the age of the stand, the age of an individual plant may not always be indicative of the amount of carbon stored.[5,15] For example, Bohlman et al. (2018)[5] found the lowest reported biomass for an individual chamise (*Adenostoma fasciculatum*) was 0.198 kg of carbon per square meter for a one-year-old individual, while the highest reported biomass was 6.818 kg of carbon per square meter for a resprouting two-year-old individual that had many dead stems. The next highest biomass was from a mature individual (>60 years old) at 4.260 kg of carbon per square meter, of which 3.363 kg of carbon per square meter was alive.[5]

Even leaf litter, which includes accumulated leaves and branches and other once-living matter on the ground that has not decayed, also consists of carbon that is being stored and not emitted into the atmosphere. Though often overlooked, such litter in shrublands has been estimated to store 5.17 to 10.28 metric tons of carbon per acre (Supplemental Table).[5]

Although carbon in belowground biomass is rarely measured or calculated, some shrubland species have been found to have 41% to 47% of their biomass below the surface,[5] and chaparral roots have been found 4 meters

(>13 feet) deep in weathered bedrock.[16] For example, Bohlman et al. (2018)[5] calculated the average reported belowground biomass carbon for mixed chaparral to be 5.38 metric tons of carbon per acre (Supplemental Table).

A substantial amount of carbon may also be stored in the microbial communities and mycorrhizal fungi that work in concert with root systems to trap carbon in biomass and soil pores and to suppress decomposition of humic substances.[17,18] One study found 3.65 metric tons of carbon per acre in soils down to 1 meter deep for chamise (Supplemental Table).[6]

Accounting for total biomass (above and below ground), soil carbon (1 meter deep), and leaf litter carbon, mixed chaparral and chamise chaparral habitats have been found to store an average 22.5 and 35.3 metric tons of carbon per acre, respectively (Supplemental Table). In addition, shrubland habitats can continue to sequester carbon as they age. Scientists estimated that mixed chaparral and chamise chaparral sequester on average an additional 1.73 and 0.45, respectively (Supplemental Table).[5]

Intact shrublands with more diverse plant communities have been found to stimulate the formation of soil pores that support optimal microbial functioning and carbon accrual.[17] And increased root surface area supports more mycorrhizae that aid in nutrient uptake and facilitate carbon flow and soil carbon accumulation.[18–20] In addition, semi-arid shrublands have been found to drive the trend and interannual variation of the global carbon cycle.[21,22] Shrublands should be recognized for their carbon storage potential and included in carbon calculations.



Colorado Desert by slworking2/Flickr

DESERTS

Carbon in desert landscapes can be found in vegetation and within the soil. Although desert plant cover is generally low, some desert shrubs can store large amounts of carbon. Desert ceanothus (*Ceanothus gregii*) was found to store up to 41 metric tons of carbon per acre in their aboveground biomass and up to 5.8 metric tons of carbon per acre in their belowground biomass while accumulating 2.4 metric tons of carbon per acre, per year (Supplemental Table).[5] Other areas with vegetation, like Joshua tree woodlands and creosote bush, likely store significant amounts of carbon as well.

There are no soil databases that have data on carbon sequestration capacity of soils below 2 meters,[23] but soil carbon in deserts should not be dismissed. Two different mechanisms can sequester deep soil organic matter in desert soils: preferential flow of dissolved organic carbon and plant rooting behavior.

Preferential flow pathways are stable paths that persist for decades and the transport of carbon into deeper soil horizons depends on soil texture and the homogeneity of surface plant cover. An example of a preferential flow pathway is the vertical cracks of clayey soils that cause an increasing variability of soil organic carbon distribution in lower soil horizons.[24]

Plant rooting behavior plays an important role in carbon storage. As roots move through the soils, they release fluids and slough-off organic material, and at some point the roots die or die back and decompose.[24] Perennial desert plants, including microphyll woodlands, creosote and other deep-rooted desert plants, can have roots that reach 30 meters below the surface where groundwater is located, resulting in the introduction of organic carbon, through plant root behavior, deep into the soil horizons.

Soil organic carbon fluctuates and is tied to rainfall, with greater organic carbon being stored when moisture is available.[25] Large stocks of soil inorganic carbon are mostly found in regions with low water availability (*i.e.*, areas with mean annual precipitation < 250 mm),[26] with deserts having the greatest densities of soil inorganic carbon compared to other ecosystems.[27,28] Soil inorganic carbon and deep soil organic carbon are very stable forms of stored carbon, and they dominate the carbon sink in deserts.[25,29] This highlights the carbon sequestration contribution of California's deserts and the need to protect these landscapes from soil disturbance and degradation from development.

The desert data provided in the report are from studies conducted in the northern Mojave Desert in Nevada, which is different from the more southern portions of the Mojave and other desert areas in California. The Mojave Desert receives almost all of its precipitation in the winter, while the southern desert in California, known as the Colorado Desert, has bimodal precipitation where rain falls in the winter and summer. The summer rainfall is known as monsoon season, when the Colorado Desert gets most of its rain. This bimodal rainfall creates many ephemerally flooded washes that support microphyll woodlands or dry desert wash woodlands. They create an important desert refugia for animals including migratory birds in California's southern desert.

Microphyll woodlands are dominated by leguminous trees with deep roots that extend down several meters and into groundwater.[30] These trees absorb carbon dioxide as they grow, creating sugars that move into the roots and soil organisms. In the desert when carbon dioxide is respired back into the soil, it reacts with calcium in the soil to form calcium carbonate, a very stable material.[30] This process sequesters large amounts of carbon into soils, making it possible that California deserts store and sequester even more carbon than reported here.

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From: kathy spencer
Sent: Monday, June 30, 2025 10:30 AM
To: Monde, Christina <CMonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

My name is Kathy Macy Spencer. I live 3 blocks from the Arroyo Seco and ride my horses on the trails in the lower Arroyo daily. I board my horses at Arroyo Seco Stables in South Pasadena.
At our stable there are at least 30 equestrians that frequently ride their horses on the trails.

I am a member of ETI Corral 2. ETI (Equestrian Trails Inc) is a nonprofit organization dedicated to the preservation of Equestrian Trails, Good Horsemanship, and Equine Legislation.

I have concerns about this project in Pasadena and South Pasadena. Project plans include removal of over 100 trees, constructing a park like setting, and diverting water from the river system.

Currently we have a dedicated equestrian trail passing through the project areas. Current plans show a narrower path with benches alongside the trail. The pathway will encourage more pedestrian usage.
Strollers, young children, and horses are not a good mix on a narrow path. Proper fencing is needed alongside the road and areas used for picnicking.

Other concerns are ...What accommodations will be made for riders during construction?
Will signs be posted prohibiting bicycles and motorized vehicles? Bicyclists are currently a problem. Equestrians encounter bicyclists on the dirt trails almost daily.

Safety is my utmost concern.

Please notify me of any upcoming meetings concerning these projects. Our organization, ETI, could be a valuable asset during the planning and construction of this project.

My regards,

Kathy Macy Spencer

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(✓) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
(✓) The loss of a local cherished community parkland including the loss of access to the water.
(✓) Removal of a water source that is currently supporting local wildlife.
(✓) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
(✓) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
(✓) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
(✓) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
(✓) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.
(✓) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
(✓) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.
(✓) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

(✓) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
(✓) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
(✓) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
(✓) Exploration of alternative areas that do not require the destruction of the current ecosystem.
(✓) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
(✓) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.
(✓) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.
(✓) An alternative that seeks input from community members and takes this information into consideration.
(✓) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?
(✓) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?
(✓) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
(✓) Additional comments:

Name: Emily Spokes Email Addres

Address:

Signature: Date: 6.14.23

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

STEWARDS OF THE ARROYO SECO

Date: June 27, 2025
From: Stewards of the Arroyo Seco
To: Christina Monde, City of Pasadena Department of Public Works
Re: Scoping Comments for the Arroyo Seco Water Reuse Project (ASWRP)

Stewards of the Arroyo Seco supports cleaning up water quality in the Arroyo Seco and the Los Angeles River by using green infrastructure and nature-based methods. The Arroyo Seco Water Reuse Project (ASWRP) relies on grey infrastructure that will degrade the Arroyo Seco stream and habitat. There is a better way to improve water quality in the Arroyo Seco, and that is to protect and enhance its natural functions. The Mitigated Negative Declaration (MND), now revoked, and the Notice of Preparation fail to comply with the goals of the Los Angeles County Safe Clean Water Program (SCWP), particularly regarding promoting biodiversity, nature-based solutions and community engagement.

You must develop and evaluate a nature-based watershed alternative to the project that encompasses the Arroyo Restoration Corridor (ARC) that extends from the San Rafael Bridge in Pasadena through South Pasadena to the York Boulevard Bridge in Los Angeles.

Key components of the ARC Nature-based Alternative are:

1. Enhance the nature and biodiversity of the Arroyo Seco. San Rafael Creek is more than a storm drain outlet. It is the last relatively natural tributary of the Arroyo Seco. The San Pascual site is a small but valuable preserve that fosters abundant birds and wildlife. Instead of employing industrial facilities and artificial wetlands, ASWRP should utilize methods that will enhance and restore the natural character of the Arroyo and the watershed in this important transition zone.

Nature-based solutions are a high priority goal of the SCWP which is funding the ASWRP. SCWP has recently established a task force to ensure that funded projects prioritize nature-based

solutions. If it is necessary to use mechanical treatment to reduce contaminants, ASWRP should do so in a way that minimizes the impact on habitat and natural stream hydrology.

2. **Verify Current Conditions.** ASWRP has been based on Enhanced Watershed Management Program (EWMP) and Load Reduction Strategy (LRS) plans that were based on conditions found in 2010 (Crest Study), fifteen years ago. It has taken far too long to clean up the stream, and there has been considerable progress since then in developing green infrastructure and nature-based approaches that would do so. San Rafael Creek (AS-41) was selected by Pasadena as a priority outfall, but that designation should be reviewed before proceeding with a costly and destructive treatment program. The EWMP and LRS programs provide for an adaptive approach to meet TMDL requirements that could include other sites, pollution prevention, conservation, best management practices, and other tools to reduce the contaminant load throughout the Arroyo Seco area. Other storm drain outfalls are discharging significantly higher levels of bacteria than San Rafael Creek. Changing conditions need to be evaluated to verify the best way to meet the water quality goals for the Arroyo Seco in the era of climate change. You must update contaminant sources in the Arroyo Seco and consider other sites and measures to achieve the Arroyo Seco TMDL bacteria goal.

3. Water Quality – Green infrastructure and nature-based methods can produce water quality improvements that meet regulatory standards. A comprehensive program to identify pollutant sources and treat them at the source with on-site retention, bioremediation, public education, and other best management practices can reduce or eliminate pollution in a cost-effective, nature-based way. The California State Water Resources Control Board (SWRCB) is accepting proposals for projects that address nonpoint source pollution. You must consider an alternative that meets regulatory goals using nature-based methods with minimal impact on natural habitat, wildlife, and hydrology.

4. Community Engagement – The EIR should promote community involvement and the energetic participation of stakeholder groups, such as Stewards of the Arroyo Seco, the Council of Arroyo Seco Organizations, Save San Pascual Park, and local agencies, including the City of Los Angeles. It is not sufficient to just announce planning results when the draft EIR is issued without a comprehensive program of community engagement throughout the planning process. Community engagement is another key goal of the SCWP. You must consider an alternative that will utilize extensive community education and engagement.

5. Water Rights - South Pasadena does not have a water right to divert water from the Arroyo Seco, which is a fully appropriated stream. That means there is no more water to export from the stream, and the State Water Resources Control Boards cannot consider new diversion permits. Instead, Pasadena and South Pasadena should work together to provide sufficient water for Arroyo Park in South Pasadena and the Golf Course by reducing turf area, utilizing

native-based landscaping, improving irrigation efficiency, and capturing local precipitation and runoff. South Pasadena cannot divert flow for irrigation, so you must consider alternatives that do not divert water for illegal uses.

6. Remove barriers to fish passage. The ASWRP identified in the revoked Mitigation Negative Declaration and the NOP would create new barriers to fish and wildlife passage at both the San Rafael site and the San Pascual site. There are thousands of native rainbow trout in the upper watershed of the Arroyo Seco that occasionally are released into the Lower Arroyo stream through Devil's Gate Dam. These trout are genetically the same as the endangered Southern California Steelhead that is listed by both the federal and state government as an endangered species. The ASWRP grey infrastructure facilities would create new barriers for the rainbow trout and for the recovery of the endangered southern steelhead. You must consider alternatives and adopt a plant that does not take endangered steelhead trout.

7. **Protect the precious habitat** that exists in the project area, such as at the San Rafael Confluence and the San Pascual site. You must consider an alternative that protects the high-quality riparian habitat in both of those areas. Lined artificial ponds will not produce genuine riparian habitat. Instead of bulldozing and replanting those sites, remove the invasive species and debris and enhance the high-quality habitat that is already there. Remove the short concrete lining in San Rafael Creek just above the confluence with the Arroyo Seco to allow the stream flow to create a natural wetland and a wide natural connection to the Arroyo Seco stream. This will help restore natural stream hydrology and promote biodiversity. You must consider an alternative that restores stream hydrology and protects and produces genuine riparian habitat and benefits for wildlife.

8. Hire a Consultant Experienced in Nature-based Stream Restoration and Pollution Prevention.

In 2019, at the very beginning of the planning process for what is now called the ASWRP, Tim Brick brought an impressive group of scientists and watershed planners from Stillwater Sciences to the San Rafael and San Pascual sites to discuss nature-based approaches to restoring the project area with city officials from Pasadena and South Pasadena. This enlightening tour was led by Wendy Katagi, a prominent river restoration expert. Attached is the handout she provided which outlines a comprehensive and professional approach to a project that would certainly be award-winning. Instead of pursuing that path, Pasadena retained engineering-oriented consultants with only limited understanding of nature and biology. You must rethink the ASWRP plan and change your consultants to conform with the goals of the Safe Clean Water program and modern stream management in the era of climate change.

Thank you very much for your consideration of the ARC Nature-based Alternative. We hope to work with you to develop a resilient program to improve water quality and watershed management in this major tributary of the Los Angeles River.

Respectfully Submitted,



Timothy F. Brick
Executive Director
Stewards of the Arroyo Seco

Relevant Resources

- Let's Restore the Arroyo Seco – Pasadena Now, June 27, 2025
- Source Control fact sheet, including Probable Sources of Contamination in the ARC
- Nature-based Solution fact sheet
- Stillwater Paper

STEWARDS OF THE ARROYO SECO

References and Resources

Stewards of the Arroyo Seco

Stewards of the Arroyo Seco is a community-based program of Stewards of Public Land, a 501©3 educational foundation. Stewards relies on a science-based approach to environmental restoration and watershed management.

Tim Brick, the Executive Director of Stewards of the Arroyo Seco, has been involved in protecting and restoring the Arroyo Seco for more than forty years. He has been associated with most of the planning efforts and restoration implementation programs.

- 1985-1986 Toward 2000, Pasadena's Strategic Plan which highlighted the Arroyo Seco and the Devils Gate area as a key planning priority for Pasadena's future.
- 1985-2012 Member, Metropolitan Water District Board of Directors; Chairman 2006-2010
- 1986-1991 Member, Devil's Gate Advisory Committee
- 1989-2023 Founder and Board Member, Arroyo Seco Foundation, Managing Director 1998
- 1991-93 Vice-chair, Devil's Gate Multi-Use Project Joint Powers Authority; , Coordinator: Lower Arroyo Low-Flow Stream Restoration Project
- 1993 Birth of Hahamongna Watershed Park
- 1995-98 Hahamongna Operating Company, Executive Director during the establishment of the park and rehabilitation of Devil's Gate Dam
- 1997-2003 Development and Adoption of Pasadena's Arroyo Seco Master Plan
- 2002-2023 Participant, USACE/LA County Flood Control District – Arroyo Seco Ecosystem Restoration Program
- 2002-Current Coordinator, Council of Arroyo Seco Organizations
- 2002- 2022 Participant, Council of Arroyo Seco Agencies
- 2004-2015 Coordinator, Arroyo Seco Watershed Management Program funded by the California Department of Conservation
- 2006-2008 Project Director, Central Arroyo Seco Stream Restoration Program, $2.5 million program funded by the State Water Resources Control Board; restored native Arroyo Chub to the stream

- 2014-2025 Member, San Gabriel Mountains National Monument Community Collaborative
- 2017-current Arroyo Seco Native Trout Recovery Program
- 2019-current Member Upper LA River and Tributaries Working Group, Santa Monica Mountains Conservancy
- 2022-2023 Arroyo Seco Stream Flow Enhancement Program
- 2023-current Executive Director, Stewards of the Arroyo Seco
- 2024-current Member, Los Angeles River Environmental Flows Framework Working Group

Wendy Katagi, CEP

You will note that Wendy Katagi has been involved in many of the key planning activities in the last twenty years (Central Arroyo Stream Restoration, Native Trout Recovery, Stream Flow Enhancement, the 2019 ARC Tour, etc.). Here is her contact information.

- Katagi@mcmillen.com
- https://www.mcmillen.com/
- https://www.linkedin.com/in/wendykatagi?utm_source=share&utm_campaign=share_via&utm_content=profile&utm_medium=ios_app

Key Arroyo Seco Planning Documents

One of the prominent gaps in ASWRP planning is the failure to consider and incorporate previous Arroyo Seco planning documents and policies. This is a list of key documents from the last four decades regarding Arroyo planning. Please note the consistent pattern of projects that incorporate Integrated Water Resources Planning methods and that prioritize nature-based solutions.

1988	**Master Plan for the Lower Arroyo Seco,** Graduate Program, Dept. of Landscape Architecture, Cal Poly, Pomona, June 1988; lays out a vision for Arroyo Seco restoration including biodiversity, stream restoration, and channel removal. https://www.arroyoseco.org/documents/1988-lower-arroyo-606-studio.pdf
2001-2002	**Arroyo Seco Ecosystem Restoration Feasibility Study** prepared by North East Trees and the Arroyo Seco Foundation for the California Coastal Conservancy https://www.arroyoseco.org/aswrfs.htm
2003	**City of Pasadena Arroyo Seco Master Plans**

	https://www.cityofpasadena.net/public-works/urban-forestry/arroyo-seco/arroyo-seco-master-plans/ **Lower Arroyo Master Plan** - https://www.cityofpasadena.net/public-works/wp-content/uploads/sites/29/City-Council-Agenda-Report-September-29-2003.pdf?v=1751232719434
2005-2023	**US Army Corps of Engineers/LA County Arroyo Seco Ecosystem Study** This webpage has a full list of activities and documents from the USACE Arroyo Seco Ecosystem Study. https://www.arroyoseco.org/corpsstudy.htm
2006	**Arroyo Seco Watershed Management and Restoration Plan** adopted by State Water Resources Control Board. This plan contains conceptual designs for the San Rafael Creek and the ARC area. https://www.arroyoseco.org/documents/arroyoseco%20wmrp2006.pdf **San Rafael Creek Restoration** https://www.arroyoseco.org/documents/NET2006/San%20Rafael%20Appendix.pdf
2011	**2011 US Army Corps of Engineers Arroyo Seco Ecosystem Restoration Study** https://www.arroyoseco.org/corps/USACE_Arroyo_Seco_FSM.pdf
2011	**2011 Roadmap to Large Scale Ecosystem Restoration of the Arroyo Seco** Prepared by Wendy Katagi, Ted Johnson, and Tim Brick. https://www.arroyoseco.org/documents/2011%20Roadmap%20to%20Large-Scale%20Ecosystem%20Restoration%20AS.pdf
2011	**Arroyo Seco Watershed Assessment** prepared for Arroyo Seco Foundation by CDM Smith https://www.arroyoseco.org/documents/watershed-assessment-final.pdf
2015	**City of Pasadena Lower Arroyo Master Plan Revised** 2015 https://www.arroyoseco.org/aswrfs.htm
2019	**Stillwater Sciences Tour Handout** on nature-based planning and ecosystem restoration at San Rafael Creek and the San Pascual site. https://www.arroyoseco.org/documents/planning/StillwaterTour.pdf
2021	**Upper LA River and Tributaries Working Group - Arroyo Seco Recommendations** This official working group was set up by the Santa Monica Mountains Conservancy to make recommendations about priority watershed projects to State of California agencies. There are major recommendations regarding Arroyo Seco environmental restoration. https://www.arroyoseco.org/documents/ULART_ASr.pdf

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From: Kathy Sturdevant
Sent: Sunday, June 29, 2025 2:54 PM
To: CMonde <CMonde@cityofpasadena.net>
Subject: San Rafael-San Pascual Water Reuse Project

Hello Ms Monde,

I am writing to encourage a reevaluation and modifications to the Arroyo Seco Water Reuse project. I believe the EIR needs to be expanded to include more environmentally friendly options including swales, concrete removal, etc. Existing trees need to be saved as much as possible to preserve the current habitat. Current pollution sources need to be stopped and the financial costs and responsibilities need to be understood and assigned appropriately. This is a complicated project that needs another look and more details ironed out before it moves forward. My concern is the long term effects of rushing into a solution that will be more costly down the line when we realize our mistakes, won't adequately address the issues, could cause disputes over responsibility, and could cause irreversible harm to the environment in that area.

I urge the city to take more time to reevaluate and improve the plan.

Thank you,
Kathy Sturdevant

Kathy Sturdevant, PMP, CSM

From: Taj Sullivan
Sent: Monday, June 30, 2025 1:06 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Urgent: Oppose Arroyo Seco Water Reuse Project – Protect Historic Equestrian & Multi-Use Corridors

Dear Ms. Monde and Members of the City of Pasadena Department of Public Works,

On behalf of the Los Angeles Equestrian Coalition, I submit this comment urging the City of Pasadena to halt the Arroyo Seco Water Reuse Project in its current form.

This project poses an unacceptable threat to one of Southern California's last historic multi-use and equestrian corridors — a route with deep roots stretching from Indigenous stewardship by the Kizh Nation to Rancho land grant horse transit and explicitly recognized in Los Angeles County's General Plans as protected equestrian infrastructure.

The proposal would remove over 140 mature trees, destabilize soils, increase dust and erosion, and narrow or obstruct trail alignments that have served riders, hikers, and the broader community for generations. Critically, it fails to uphold the Los Angeles County Trails Manual (2003) and the California State Parks Trail Handbook (2007), which require:

8–12 foot tread widths and 10 foot vertical clearances for safe multi-use and equestrian passage,

Preservation of native canopy and natural surfaces essential for horse hoof safety,

And avoidance of impacts to culturally significant lands and corridors.

Furthermore, the plan diverts approximately 175 million gallons annually from the Arroyo Seco — largely to irrigate a South Pasadena golf course — fundamentally altering riparian conditions and further threatening trail stability and safety.

These corridors are not just recreational amenities. They are vital, historic pathways of cultural mobility and multi-generational equestrian tradition, sustaining working-class and Latino communities who maintain charro and vaquero practices. Disrupting them violates principles of mobility justice and erases irreplaceable cultural infrastructure.

We strongly urge the City of Pasadena to:

Reject or substantially redesign this project to protect these trails,

Guarantee compliance with County and State trail standards,

Implement binding protections for safe equestrian access before, during, and after any work,

Engage the Kizh Nation as rightful stewards in any decision-making impacting their ancestral lands,

And pursue alternative stormwater strategies that preserve these irreplaceable corridors.

Thank you for considering this critical matter and for upholding the cultural, environmental, and mobility legacies entrusted to your stewardship.

Sincerely,

Taj Sullivan

From: Diane K. Suzuki
Sent: Tuesday, June 3, 2025 5:46 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Re San Pascual EIR

Dear Ms. Monde,

I am a concerned resident of Los Angeles CDI and a park user. I understand that your firm has been tasked with the EIR re San Pasquel, and respectfully request that the EIR include:

- Direct consultation with the Gabrieleno Kizh nation, whose land this was. Please include their input, expertise, and mitigation measures on protecting the land, water, wildlife, and cultural resources.
- Alternatives to the proposed project that include nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation, and the reintroduction of Steelhead Trout. LA County pledged $5 million to consider stream restoration. I am concerned that the proposed project would prevent stream restoration in this portion of the Arroyo.
- Address the issue of cleaning the pollution at the source. The proposed cleanup at San Pascual does not currently address the pollution going into the river.
- Please suggest alternative areas that do not require the destruction of the current ecosystem.
- Provide current and clear data on Arroyo Seco contamination sources (the current data is 15 years old). Please include contamination data from the South Pasadena Golf Course and its downstream areas.
- Provide clear and transparent data showing how much water is diverted to the Golf Course, infiltration, irrigation, or wetland support, and how the water flow seasonally shifts during times of drought.
- The proposed project stipulates maintenance for 30 years. Please address the impacts that will occur when the 30-year maintenance agreement ends.
- Provide legal information on whether granting land in perpetuity violates the LA Charter 594 c.
- Please outline the benefits to LA City residents, the water LA City will receive, and the amount South Pasadena Golf Course is to pay for the water they will receive in perpetuity.
- Provide a detailed biological survey that observes all wildlife using the area

In addition, I ask that you examine the negative environmental impacts resulting from:

- The removal of over 140 mature trees and bushes, and their replacement with small saplings.
- The loss of a local community parkland, with loss of access to the water.
- Removal of the water source supporting local wildlife.
- Loss of local green ecosystem habitats in the wildlife corridor connecting to the San Gabriel Mountains.
- Air pollution resulting from the demolition of the green canopy, which purifies the freeway's pollution.
- Heat islands that will last for at least 15 years, until a mature canopy can recapture its cooling benefits.
- The loss of mature trees.
- Water capture at the site and the resulting reduced downstream flow -- affecting downstream habitats.

Sincerely,

Diane Suzuki

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2. Saplings provide no benefit for 10 years or more.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

( ) An alternative that seeks input from community members and takes this information into consideration.

( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

( ) The San Pascual site is designed to provide the total estimated annual irrigation water to the South Pasadena Golf Course. Will the Golf Course be guaranteed its full irrigation allocation regardless of future climate variability or water scarcity? Will the City of South Pasadena, as the golf course's owner, be financially responsible for the diverted and purified water? How is water allocation prioritized, and who makes these decisions?

( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Tom B Email Address: tom@taocreative.com

Address: _____

Signature: _____ Date: _____

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez, Pasadena City Council, South Pasadena City Council

From: Jennifer Trotoux
Sent: Tuesday, May 27, 2025 8:08 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project

Christina Monde
City of Pasadena

Dear Ms. Monde,

I am writing in support of the Arroyo Seco Water Reuse Project. I went to the site yesterday and walked the whole area. I see nothing but value in what is proposed. The area is in dire need of restoration. Clearing it out and removing the excess of non-native trees would make it safer and more accessible. This area is not some remnant of Virgin Nature that should not be touched. It was clearly created as a part of a constructed watershed management system and is now a hazardous mess due to a combination of human action and inaction. It is not functioning the way we need it to. An understanding of how our watersheds (with their natural and human-made elements) should look and function is critical to the health of our urban-natural environment and its role in our local culture.

In our own garden, we have created pits and swales to discourage runoff and return of rainwater to the ground. This is a generational shift in thinking about water runoff, and South Pasadena (where I live) and Pasadena (my birthplace, childhood home, and where I work) must be critical stewards of these ideas. The impact and volume of this project appears to be a much-needed move in the right direction.

I look forward to learning more and supporting the project at the meeting on Wednesday evening.

Sincerely,
Jennifer Trotoux

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

(X) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.
( ) The loss of a local cherished community parkland including the loss of access to the water.
( ) Removal of a water source that is currently supporting local wildlife.
( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.
( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?
( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway
( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.
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( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.
( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.
( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.
( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.
( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.
( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.
( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.
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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.
( ) Additional comments:

Name: Via Trujillo Email Address:

Address:

Signature: Date: 9/14/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

June 29, 2025

Christina Monde, P.E.
City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

Re: Arroyo Seco Reuse Project, EIR Scoping Comments

Dear Ms. Monde,

Since the Scoping phase of CEQA accepts public comment on the scope and content of the EIR, this letter suggests some areas to be studied and addressed in the EIR for the *Arroyo Seco Water Reuse Project*. The Project aims to achieve the water quality targets in the Arroyo Seco through diversion, runoff/pollutant capture, filtration, recharge, and release. The Project is situated at the confluence of San Rafael Creek and the Arroyo Seco, which is a major tributary of the Los Angeles River. The Project will affect the future of all three of these waterways. Its impacts will be local as well as regional. To this effect, thorough consideration of the following issues is requested:

1. Include Alternatives that credibly represent Nature Based Solutions as defined by a non profit or governmental entity

The Initial Study lists one of the Safe Clean Water targets for the project as: Prioritization of Nature-based Solutions (NbS). Table 1 in the Initial Study describes NbS measures for the Project as “Landscape plans will include additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the Project sites. The swales will be sized to convey all the flows from the surface drainage.” This very limited description of natural processes raises concerns about the Project’s use of the term ‘Nature Based Solutions.’

The term ‘Nature Based Solutions’ is often misused, and several aspects of the Project as described resemble grey infrastructure that happens to utilize native plant species. Project elements should be consistent with Nature Based Solutions as defined by entities that have the public interest and global biodiversity community in mind, such as International Union for Conservation of Nature (IUCN). The IUCN definition of Nature Based Solutions served as a model for an actionable definition of Nature Based Solutions for Los Angeles County which is currently being workshopped by a committee led by LA County Public Works and Council for Watershed Health.

If prioritizing Nature Based Solutions is one of the goals of the Project, Project Alternatives that credibly represent different Nature Based Solutions for water quality must be included in the EIR. Project mechanisms for maintaining healthy and complex vegetation and soil microbiomes, and for enhancing the connection between the groundwater table, surface water, and aboveground vegetation, and other the ways natural landscapes clean water, should be explicitly described for each Project Alternative.

2. The Project should be consistent with other publicly funded initiatives along the Los Angeles River and Arroyo Seco

Regional waterways such as the Los Angeles River, transcend City boundaries. To date, substantial public resources at the federal, state, regional, and local levels have been invested in plans for restoration of fish passage and fish habitat in our regional rivers. The LA River has been the subject of a number of plans to re-establish fish passage, including the Los Angeles River Fish Passage and Habitat Structures Design (LAR FPHS) Project, and the Los Angeles River Fish Passage Restoration (LAR FPR) Project, funded by public funds distributed by the State of California Wildlife Conservation Board (WCB), Santa Monica Mountains Conservancy (SMMC) with City of Los Angeles as a lead agency. These Projects involved coordination with other partners. At the federal level: U.S. Bureau of Reclamation (Reclamation), National Marine Fisheries Service (NMFS), U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS). At the State level: California Department of Fish and Wildlife (CDFW). At the regional level: County of Los Angeles, Southern California Coastal Water Research Project (SCCWRP), Rivers and Mountains Conservancy. Nonprofits such as Arroyo Seco Foundation (ASF), Stewards of the Arroyo Seco, Council for Watershed Health, Friends of the Los Angeles River (FoLAR), CalTrout, and Trout Unlimited have been invested substantial resources in promoting fish passage.

The Arroyo Seco is a particularly important tributary for fish passage in the LA River because of the high quality habitat in its upper watershed. If funded by public monies, the Project should be consistent with ongoing planning of governments and nonprofits to create refugia and habitat for native fish. This means that the Project should be designed to minimize mortality caused by pipes, pumps, industrial filters, and other infrastructure. Such infrastructure as well as lined wetlands are inconsistent with Nature Based Solutions. The Project should not obviate creation of refugia and fish passage along the Arroyo Seco or San Rafael Creek in the future.

3. Vegetation, Carbon sequestration and Maintenance

The Project will remove 142 of the 195 trees in the area, including 42 that are ‘protected’. Though new trees will be planted, the loss of habitat and shade will be substantial, and not likely to be reestablished for more than a decade if at all. Given increasingly hot temperatures, this is

a substantial impact on local habitat and neighborhoods.

The large number of trees to be removed, and slow rate of growth of replacement nursery trees (as typically seen in other designed landscapes) raises concerns about whether the benefits of the Project will compensate for its large carbon footprint.

It is well known that other public infrastructure that serves a flood control or infiltration purpose are routinely cleared of vegetation to maintain design capacity and scraped to remove sediments that compromise infiltration rates. Please clarify whether habitat and soils on the site will be allowed to mature and become more complex over time, as in a natural system, or whether it would need to be cleared regularly. Will the vegetation on the site offer habitat suitable for wildlife to breed? Or will the anticipated maintenance regime risk creating a habitat sink? Please describe explicitly what would happen if Least Bell's vireo were to be documented on site.

Given our current biodiversity crisis, and the progression of climate change, it is unfortunate that the CEQA process treats our current situation of degraded habitat and habitat fragmentation as a baseline, offering no incentive to cities or project proponents to improve or enhance or create new habitat. Despite this, I encourage the lead agency and approving entities to consider how the project design can enhance existing efforts to reestablish fish passage and increase habitat for rare birds like Least Bell's vireo, address our current biodiversity crisis, and strengthen the dynamic hydrologic connection between native vegetation communities, surface water, and groundwater in service of water quality.

Thank you for your thorough consideration of these issues.

Sincerely,

Jane Tsong

Pasadena and Highland Park, Los Angeles

From: Jane Tsong
Sent: Monday, June 30, 2025 11:26 PM
To: Monde, Christina <CMonde@cityofpasadena.net>
Cc:
Subject: Arroyo Seco Reuse Project, EIR Scoping Comments

June 29, 2025

Christina Monde, P.E.

City of Pasadena, Department of Public Works
100 North Garfield Ave, Suite N306
Pasadena, CA 91101
Email: *CMonde@cityofpasadena.net*

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Thank you for your thorough consideration of these issues.

Sincerely,

Jane Tsong

Pasadena andHighland Park, Los Angeles

To: Christina Monde, P.E., CMonde@cityofpasadena.net

I want the Environmental Impact Report (EIR) to address the following:

Negative impacts resulting from:

( ) The removal of over 140 mature trees and bushes and the inadequacy of replacing them with small saplings.

( ) The loss of a local cherished community parkland including the loss of access to the water.

( ) Removal of a water source that is currently supporting local wildlife.

( ) Loss of a local green ecosystem habitat and an important wildlife corridor connecting to the San Gabriel mountains.

( ) Loss of birds, frogs, fish, clams, turtles and other animals whose habitat will be lost for more than 2 years during construction and while saplings grow to maturity who may never recover from this loss. Will the water still provide habitat?

( ) Noise pollution from demolition, construction and loss of trees that currently mitigate the noise from the freeway

( ) Light pollution - loss of mature trees that shield the community and wildlife at night from the sport field lights and from FWY vehicles.

( ) Air pollution resulting from demolition and loss of the green canopy which reduces freeway pollution. Show clear data.

( ) Heat island effect that will last for at least 15 years, until a mature canopy can recapture its cooling benefits. Retaining mature trees is crucial for mitigating climate change.

( ) Amount of carbon that will released into atmosphere by decaying trees that are cut down and amount of CO2 uptake lost by removing trees that uptake CO2.

( ) Cumulative impacts from this and other water capture projects and how it will reduce downstream flow affecting downstream habitats, especially in summer months.

EIR must also include:

( ) Direct consultation with the Gabrieleno Kizh nation, whose land this was. Include their input, expertise and mitigation measures on protecting the land, water, wildlife and cultural resources.

( ) Alternatives to the proposed project that includes nature-based solutions that consider stream restoration, connectivity, wildlife habitat preservation and the re-introduction of Steelhead Trout.

( ) EIR must address the issue of cleaning the contamination at the source. The proposed cleanup at San Pascual Park will not address the pollution going into the river from known sources. The proposed project will waste millions on a cleanup midstream while allowing known pollutants to continue to flow into the river including from the South Pasadena Golf Course.

( ) Exploration of alternative areas that do not require the destruction of the current ecosystem.

( ) Provide current and clear data on Arroyo Seco contamination sources (not 15-year-old data). Include contamination data from the South Pasadena Golf Course and downstream from it.

( ) Clear transparent data showing how much water would be diverted to infiltration, irrigation or wetland support and how it shifts during each season or during times of drought.

( ) The proposed project asks for LA Park land into perpetuity but maintenance is only proposed for 30 years. Address the impacts when this maintenance ends. Provide scope of responsibility after 30 years. Provide legal information on whether granting land into perpetuity violates the LA Charter 594 c.

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( ) Study, how much will South Pasadena Golf Course pay for the water they will receive in perpetuity? Who will they pay it to?

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( ) Study alternate solutions including a "no build alternative" and an alternative that includes no water being diverted to the South Pasadena Golf Course.

( ) Additional comments:

Name: Rod Vlaunday Email Address

Address:

Signature: Date: 5/29/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: John URQUIZA Email Address: ___

Address: ___

Signature: _____ Date: 5/29/25

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

To: Christina Monde, P.E., CMonde@cityofpasadena.net

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( ) Additional comments:

Name: AJA WOLVMAN Email Address: _

Address:

Signature: Date: 10/28/2025

cc: Ysabel Jurado, Jessica Caloza, Maria Elena Durazo, Jimmy Gomez

Final

June 26, 2025

Christina Monde, P.E.
City of Pasadena Department of Public Works
100 North Garfield Avenue, Suite N306
Pasadena, CA 91101

Via E-mail: CMonde@cityofpasadena.net

Re: Arroyo Seco Water Reuse Project EIR Scoping Comments

Dear Ms. Monde:

The West Pasadena Residents' Association (WPRA) appreciates this opportunity to provide EIR Scoping comments for the Arroyo Seco Water Reuse Project.

WPRA represents over 7,000 households in southwest Pasadena, almost all of which are within a few blocks of the Arroyo Seco, and many of which are also adjacent to the Arroyo Seco Channel or the San Rafael Creek. WPRA and its neighborhoods are acutely aware of and interested in the Arroyo Seco's preservation, condition, and maintenance.

Topics to be Studied and Analyzed.

WPRA has reviewed the list in the Notice of Preparation of Topics to be studied and analyzed in the EIR that have the potential for significant Environmental impacts, as well as the list of Topics to be excluded. We agree with and support the following list of Topics to be included in the EIR for study and analysis: Aesthetics; Air Quality; Biological Resources; Cultural Resources; Greenhouse Gas Emissions; Hydrology and Water Quality; Land Use and Planning; Noise; Public Services (Parks); Recreation; Tribal Cultural Resources; and Wildfire.

Special Attention for Study and Analysis.

The community, including an extensive list of stakeholders such as WPRA, has worked tirelessly over many years to establish a vision for the future, including restoration, of the Arroyo Seco. In this regard, we support EIR consideration and analysis of all of Pasadena's adopted policies concerning the Arroyo Seco. For example, the Arroyo Seco Master Plan was

WEST PASADENA RESIDENTS' ASSOCIATION
POST OFFICE BOX 50252 * PASADENA, CA 91115

adopted by the Pasadena City Council in 2003 and continues to be the roadmap for the planning, preservation and enhancement of the unique and irreplaceable asset that is the Arroyo Seco. WPRA also supports EIR consideration of various studies to restore the Arroyo Seco including its water resources such as the 2006 Watershed Plan for San Rafael Creek, as well as adopted applicable local, regional and State Water policies and plans.

Project Alternatives, Mitigations, and Cumulative Impacts.

Section 21002 of the California Environmental Quality Act (CEQA) law requires that a public agency shall not approve a project as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of the proposed project.

In this regard, WPRA supports EIR study and analysis of a robust number of feasible project alternatives, particularly nature-based alternatives, which will meet goals of environmental restoration and sustainability along with avoiding significant environmental effects of the proposed project. Similarly, as to mitigations, we support EIR inclusion of feasible, specific, detailed, and enforceable mitigation measures that will ensure environmental restoration and sustainability and mitigate significant environmental effects of the proposed project.

Past, current, and planned future Water-related projects are common for the Arroyo Seco. WPRA also supports robust consideration of the proposed project's significant Cumulative Impacts as required by CEQA, including inclusion of feasible mitigations and analysis of adopted applicable local, regional and State Water policies and plans and approved local land use documents.

Thank you for your attention to and consideration of our comments and concerns. Feel free to contact the undersigned at (if you have comments or questions.

Sincerely,

Carlos Javelera
Vice President
For the Board of Directors

cc: WPRA Board of Directors
Steve Madison, Council Member, District 6
Justin Chapman, District 6 Council Liaison

WEST PASADENA RESIDENTS' ASSOCIATION
POST OFFICE BOX 50252 * PASADENA, CA 91115

From: julie williams
Sent: Thursday, May 29, 2025 10:38 AM
To: Monde, Christina <cmonde@cityofpasadena.net>
Subject: Arroyo Seco Water Reuse Project - Public Comments

I was at the public meeting last night in South Pasadena. I appreciate the information and graphics that were provided, this was my first introduction to the project. After the meeting we drove over and took a look at the lower portion of the project site.

I am interested in learning more about the details, but from the information I have I am in favor of the project.

I would like to see following issues be addressed in the EIR:

Please allow for more public comment and dialog with the community. Local residents who live in the area want to be heard and they deserve to be treated with respect.

The Gabrielino Kizh nation should be included in the planning of this project.

More detailed information about water used now and how it will change with this project.
Specifically how much water will be taken out of the river for the gold course and how much will be put back from runoff?

What is the source of the water contamination?

Are there any opportunities for mitigation of the construction noise & dust, increased light coming from the baseball fields, that can be made to the residents living across the river near San Pasqual Park? Could there be improvements made to San Pasqual Park that residents there have requested.

Sincerely,

Julie Williams

From: Rachel Wing <
Sent: Sunday, June 29, 2025 5:13 PM
To: Monde, Christina <cmonde@cityofpasadena.net>
Cc: Lyon, Jason; Thyret, Pam
Subject: Arroyo Seco Water Reuse Project - Public Comment

To: Christina Monde, P.E., City of Pasadena Department of Public Works

Subject: Comment on Proposed Arroyo Seco Water Reuse Project

I am opposed to the proposed project as presented in the Notice of Preparation and associated documents on several grounds:

- The need for the project and its goals, and the relation of those to the proposed project, are not clearly spelled out so that the public can understand:
    - why the project needs to be done
    - how the proposed project would meet those goals
    - what alternative solutions have been considered and why they are not being pursued
    - what role the pursuit of ancillary goals (such as providing irrigation water for the golf course and reduction of zinc and copper) play, if any, in the agency's decision to pursue the proposed project
    - what methods were used to determine the levels of bacterial contamination that are, presumably, the principal motivator for the project, nor information about what those levels were at various locations, nor about the sources of that contamination.
- The proposed project proposes to build, operate and maintain significant infrastructure (pumps, vaults, pipes, access roads, etc.) rather than apply a variety of more environmentally sustainable solutions, including riparian restoration to promote natural filtering and pollution prevention at its sources, such as investigating illegal discharges, installing "green streets" solutions, etc.
- The proposed project will reduce tree canopy - at least for the medium term if not permanently.
- The proposed project will permanently remove an existing quasi-natural woodland in the San Rafael site, which could be restored to be high quality natural woodland habitat - a scarce resource for nature-based recreation and education.

The EIR should address all of the above concerns. In addition, in order for the public to be able to accurately understand and evaluate the project and its impacts, the EIR should include a project development history that should spell out in detail exactly what issue (presumably elevated bacterial contaminant levels) motivated the project at the outset; if that issue has evolved and in what way; what approaches have been considered and how and why they were rejected and provide a full discussion of the possibility that changes may have occurred subsequently (in technology or facts on the ground) that warrant reconsideration of those approaches.

I am inspired by an alternative vision of a natural Arroyo Seco, which was presented by South Pasadenan Barbara Eisenstein in her comments to the South Pasadena City Council earlier this month: "*Instead of buried pumps and lined wetlands – all requiring maintenance – we could start by cleaning up the garbage and the invasives, and opening the area to the public with a system of small trails. Kids and their parents could stop by after a Little League game to see the tadpoles, frogs, turtles and birds who call this cool & refreshing spot home.*" I have attached the full transcript of those comments and I ask that it be included as part of my comment.

Thank you for giving me the opportunity to comment on this project.

Sincerely,
Rachel Wing

South Pasadena City Council Meeting, 6/18/25
Public Comment, Non-agenda Item
Arroyo Seco Watershed Restoration

Thank you, city council and staff for the opportunity to speak here. As you all know from my many appearances, and my work in the nature park, I am committed to a restored and living Arroyo Seco. Today, rather than once again telling you what I think is wrong with the Arroyo Seco Water Reuse Project, I'd like to paint a picture of what we could have instead.

This is not some unrealistic, pie-in-the-sky dream. The Army Corps of Engineers worked for years with LA Co Flood Control and the cities along the Arroyo to study the feasibility of restoring it. Millions of dollars have been spent on this, and the consensus is that we do not have to accept an ugly, degraded channelized sewer for the sake of flood protection.

The park land along the Arroyo Seco opens the possibility of allowing the river to flow and even flood in places, as it always has. So imagine our city working with our neighbors along the Arroyo to chip away as this degraded channel – which is in dire need of repair and upgrade. There is the money because repairing the channel would cost untold millions/billions, and doing nothing leaves us vulnerable to vastly more costly destruction. There are ideas – Army Corps, Stillwater Sciences, North East Trees, Stewards of the Arroyo Seco, and more have presented concept plans.

Stop and visualize this. The Arroyo Seco diversion – that little wooded wildland and creek – could be ground zero for releasing the Arroyo Seco from its awful, concrete straitjacket. It could be the model for continued work along the Arroyo from the mountains on down to its confluence with the LA River.

Instead of buried pumps and lined wetlands – all requiring maintenance – we could start by cleaning up the garbage and the invasives, and opening the area to the public with a system of small trails. Kids and their parents could stop by after a Little League game to see the tadpoles, frogs, turtles and birds who call this cool & refreshing spot home.

You might say, but we can't leave all of the garbage and pollution in the water, and I agree. Let's first determine what we have to deal with – we need current water quality tests. Then let's figure out where it is coming from and see whether we can remove it before it enters the system. Let's employ nature-based solutions like bioswales and infiltration basins.

The Water Reuse project will not just remove some big old trees, it will scrape the ground of all of its organisms, kill the diverted creek, and leave all of the animals that rely on it to die. Where will the birds and the rest go during the 17 or so months of destruction and construction? They will not come back and this incredibly unique gift that we have in South Pasadena will be gone forever.

Barbara Eisenstein, 1852 Monterey Road, Friends of SP Nature Park

Friends of
SOUTH PASADENA
NATURE PARK

Appendix B-1

Construction Mass Daily Emissions

16364 - Arroyo Seco Wate Reuse Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	16364 - Arroyo Seco Wate Reuse
Construction Start Date	9/1/2026
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50000
Precipitation (days)	7.20000
Location	34.12065303999505, -118.16760703700828
County	Los Angeles-South Coast
City	South Pasadena
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4945
EDFZ	7
Electric Utility	Pasadena Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.41

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
City Park	1.50000	Acre	1.50000	0.00000	65,340.0	65,340.0	—	San Rafael

City Park	2.20000	Acre	2.20000	0.00000	95,832.0	95,832.0	—	San Pascual

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.78854	1.46315	14.3348	17.2864	0.03437	0.58442	0.75972	1.33012	0.53862	0.15197	0.68946	—	4,112.59	4,112.59	0.17474	0.18638	2.80204	4,175.30
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.78656	1.46084	14.3959	17.1551	0.03437	0.58442	0.74570	1.33012	0.53862	0.15084	0.68946	—	4,102.69	4,102.69	0.16895	0.18665	0.07271	4,162.60
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.75363	0.61567	6.09521	6.96637	0.01547	0.23458	0.26345	0.49804	0.21622	0.05709	0.27331	—	1,812.96	1,812.96	0.07488	0.08285	0.53685	1,840.06
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.13754	0.11236	1.11238	1.27136	0.00282	0.04281	0.04808	0.09089	0.03946	0.01042	0.04988	—	300.156	300.156	0.01240	0.01372	0.08888	304.643

2.2. Construction Emissions by Year

2.2.1. Total Construction Emissions by Year, Unmitigated

Includes both onsite and offsite emissions.

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.92634	0.75634	7.45159	10.0807	0.01613	0.35091	0.38429	0.66326	0.32340	0.07900	0.40241	—	2,059.68	2,059.68	0.09179	0.10380	1.79372	2,094.69
2027	1.78854	1.46315	14.3348	17.2864	0.03437	0.58442	0.75972	1.33012	0.53862	0.15197	0.68946	—	4,112.59	4,112.59	0.17474	0.18638	2.80204	4,175.30
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.74015	0.61477	5.94096	6.12646	0.01523	0.22009	0.38430	0.60438	0.20304	0.07848	0.28153	—	1,645.40	1,645.40	0.06693	0.09647	0.04060	1,658.57
2027	1.78656	1.46084	14.3959	17.1551	0.03437	0.58442	0.74570	1.33012	0.53862	0.15084	0.68946	—	4,102.69	4,102.69	0.16895	0.18665	0.07271	4,162.60
2028	0.31723	0.26728	2.26903	3.28640	0.00422	0.09512	0.06535	0.16047	0.08751	0.01532	0.10283	—	519.071	519.071	0.01932	0.00608	0.00481	521.371
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.15970	0.12878	1.30561	1.60887	0.00286	0.06023	0.08636	0.14659	0.05554	0.01852	0.07406	—	369.861	369.861	0.01702	0.02330	0.16520	377.396
2027	0.75363	0.61567	6.09521	6.96637	0.01547	0.23458	0.26345	0.49804	0.21622	0.05709	0.27331	—	1,812.96	1,812.96	0.07488	0.08285	0.53685	1,840.06
2028	0.01924	0.01621	0.13764	0.20003	0.00026	0.00577	0.00395	0.00972	0.00531	0.00092	0.00623	—	31.5451	31.5451	0.00117	0.00037	0.00488	31.6891
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.02914	0.02350	0.23827	0.29362	0.00052	0.01099	0.01576	0.02675	0.01014	0.00338	0.01352	—	61.2347	61.2347	0.00282	0.00386	0.02735	62.4822
2027	0.13754	0.11236	1.11238	1.27136	0.00282	0.04281	0.04808	0.09089	0.03946	0.01042	0.04988	—	300.156	300.156	0.01240	0.01372	0.08888	304.643
2028	0.00351	0.00296	0.02512	0.03651	0.00005	0.00105	0.00072	0.00177	0.00097	0.00017	0.00114	—	5.22264	5.22264	0.00019	0.00006	0.00081	5.24650

2.2.2. Onsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.83506	0.70168	6.74876	9.01573	0.01243	0.34386	0.13794	0.35097	0.31635	0.01490	0.31645	—	1,346.15	1,346.15	0.05461	0.01092	0.00000	1,350.77
2027	1.65742	1.39134	13.1377	15.9153	0.02747	0.57249	0.27582	0.84831	0.52669	0.02979	0.55647	—	2,929.74	2,929.74	0.11884	0.02377	0.00000	2,939.79

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.72690	0.60943	5.72532	6.02432	0.01388	0.21429	0.13794	0.35097	0.19715	0.01490	0.21089	—	1,458.25	1,458.25	0.05915	0.01183	0.00000	1,463.25
2027	1.65742	1.39134	13.1377	15.9153	0.02747	0.57249	0.27582	0.84831	0.52669	0.02979	0.55647	—	2,929.74	2,929.74	0.11884	0.02377	0.00000	2,939.79
2028	0.29788	0.25030	2.24963	3.04659	0.00422	0.09512	0.00000	0.09512	0.08751	0.00000	0.08751	—	457.199	457.199	0.01855	0.00371	0.00000	458.768
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.14197	0.11928	1.13283	1.42898	0.00198	0.05856	0.02460	0.08316	0.05387	0.00266	0.05653	—	214.109	214.109	0.00869	0.00174	0.00000	214.844
2027	0.70345	0.59030	5.52560	6.49994	0.01222	0.22955	0.07746	0.30701	0.21118	0.00836	0.21955	—	1,297.57	1,297.57	0.05264	0.01053	0.00000	1,302.02
2028	0.01807	0.01518	0.13647	0.18482	0.00026	0.00577	0.00000	0.00577	0.00531	0.00000	0.00531	—	27.7362	27.7362	0.00113	0.00023	0.00000	27.8313
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.02591	0.02177	0.20674	0.26079	0.00036	0.01069	0.00449	0.01518	0.00983	0.00049	0.01032	—	35.4482	35.4482	0.00144	0.00029	0.00000	35.5698
2027	0.12838	0.10773	1.00842	1.18624	0.00223	0.04189	0.01414	0.05603	0.03854	0.00153	0.04007	—	214.828	214.828	0.00871	0.00174	0.00000	215.565
2028	0.00330	0.00277	0.02491	0.03373	0.00005	0.00105	0.00000	0.00105	0.00097	0.00000	0.00097	—	4.59204	4.59204	0.00019	0.00004	0.00000	4.60780

2.2.3. Offsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.09128	0.05466	0.70283	1.06498	0.00370	0.00705	0.31171	0.31876	0.00705	0.07890	0.08596	—	713.528	713.528	0.03719	0.09288	1.79372	743.928
2027	0.13920	0.08395	1.19714	1.57750	0.00690	0.01193	0.48390	0.49448	0.01193	0.12219	0.13298	—	1,182.85	1,182.85	0.05589	0.16262	2.80204	1,235.51
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.06979	0.03556	0.71362	0.67369	0.00370	0.00705	0.24635	0.25341	0.00705	0.06359	0.07064	—	640.731	640.731	0.03454	0.09051	0.04060	668.606
2027	0.12914	0.06950	1.25816	1.23979	0.00690	0.01193	0.46988	0.48181	0.01193	0.12105	0.13298	—	1,172.95	1,172.95	0.05011	0.16288	0.07271	1,222.81
2028	0.01935	0.01698	0.01940	0.23981	0.00000	0.00000	0.06535	0.06535	0.00000	0.01532	0.01532	—	61.8721	61.8721	0.00077	0.00237	0.00481	62.6024

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.01773	0.00949	0.17278	0.17989	0.00088	0.00167	0.06176	0.06343	0.00167	0.01586	0.01752	—	155.752	155.752	0.00834	0.02157	0.16520	162.552
2027	0.05017	0.02537	0.56961	0.46644	0.00325	0.00504	0.18599	0.19103	0.00504	0.04873	0.05376	—	515.390	515.390	0.02224	0.07232	0.53685	538.036
2028	0.00117	0.00102	0.00117	0.01521	0.00000	0.00000	0.00395	0.00395	0.00000	0.00092	0.00092	—	3.80890	3.80890	0.00005	0.00014	0.00488	3.85780
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.00324	0.00173	0.03153	0.03283	0.00016	0.00031	0.01127	0.01158	0.00030	0.00289	0.00320	—	25.7865	25.7865	0.00138	0.00357	0.02735	26.9124
2027	0.00916	0.00463	0.10395	0.08512	0.00059	0.00092	0.03394	0.03486	0.00092	0.00889	0.00981	—	85.3287	85.3287	0.00368	0.01197	0.08888	89.0779
2028	0.00021	0.00019	0.00021	0.00278	0.00000	0.00000	0.00072	0.00072	0.00000	0.00017	0.00017	—	0.63061	0.63061	0.00001	0.00002	0.00081	0.63870

2.3. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01672	0.01672	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02839	0.80195	0.83035	0.00324	0.00005	0.00000	0.92568

2.4. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Waste	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.09160	0.09160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Waste	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Waste	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.17149	4.84384	5.01533	0.01955	0.00029	0.00000	5.59113

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.01672	0.01672	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.80195	0.80195	0.00040	0.00005	—	0.82634
Waste	—	—	—	—	—	—	—	—	—	—	—	0.02839	0.00000	0.02839	0.00284	0.00000	—	0.09933
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	0.01672	0.01672	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.02839	0.80195	0.83035	0.00324	0.00005	0.00000	0.92568

3. Construction Emissions Details

3.1. San Rafael Demolition (2026)

3.1.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83506	0.70168	6.74876	9.01573	0.01243	0.34386	—	0.34386	0.31635	—	0.31635	—	1,346.15	1,346.15	0.05461	0.01092	—	1,350.77
Demolition	—	—	—	—	—	—	0.00064	0.00064	—	0.00010	0.00010	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	0.04804	0.04037	0.38828	0.51871	0.00072	0.01978	—	0.01978	0.01820	—	0.01820	—	77.4495	77.4495	0.00314	0.00063	—	77.7153
Demoliti on	—	—	—	—	—	—	0.00004	0.00004	—	0.00001	0.00001	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Roa d Equipm ent	0.00877	0.00737	0.07086	0.09467	0.00013	0.00361	—	0.00361	0.00332	—	0.00332	—	12.8227	12.8227	0.00052	0.00010	—	12.8667
Demoliti on	—	—	—	—	—	—	0.00001	0.00001	—	< 0.000005	< 0.000005	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.1.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05195	0.04602	0.04850	0.80731	0.00000	0.00000	0.16339	0.16339	0.00000	0.03830	0.03830	—	169.359	169.359	0.00703	0.00592	0.57303	171.873
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.03933	0.00864	0.65433	0.25768	0.00370	0.00705	0.14832	0.15537	0.00705	0.04061	0.04766	—	544.170	544.170	0.03016	0.08695	1.22069	572.056
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00297	0.00262	0.00341	0.04149	0.00000	0.00000	0.00936	0.00936	0.00000	0.00219	0.00219	—	9.37364	9.37364	0.00042	0.00034	0.01426	9.49998
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00224	0.00049	0.03960	0.01489	0.00021	0.00041	0.00850	0.00891	0.00041	0.00233	0.00273	—	31.3139	31.3139	0.00174	0.00500	0.03018	32.8783

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00054	0.00048	0.00062	0.00757	0.00000	0.00000	0.00171	0.00171	0.00000	0.00040	0.00040	—	1.55191	1.55191	0.00007	0.00006	0.00236	1.57283
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00041	0.00009	0.00723	0.00272	0.00004	0.00007	0.00155	0.00163	0.00007	0.00043	0.00050	—	5.18438	5.18438	0.00029	0.00083	0.00500	5.44338

3.2. San Rafael Site Preparation (2026)

3.2.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51143	0.42974	4.05508	4.97910	0.00679	0.21303	—	0.21303	0.19599	—	0.19599	—	735.346	735.346	0.02983	0.00597	—	737.870
Dust From Material Movement	—	—	—	—	—	—	0.13794	0.13794	—	0.01490	0.01490	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51143	0.42974	4.05508	4.97910	0.00679	0.21303	—	0.21303	0.19599	—	0.19599	—	735.346	735.346	0.02983	0.00597	—	737.870
Dust From Material Movement	—	—	—	—	—	—	0.13794	0.13794	—	0.01490	0.01490	—	—	—	—	—	—	—

Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03083	0.02590	0.24442	0.30011	0.00041	0.01284	—	0.01284	0.01181	—	0.01181	—	44.3222	44.3222	0.00180	0.00036	—	44.4743
Dust From Material Movement	—	—	—	—	—	—	0.00831	0.00831	—	0.00090	0.00090	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00563	0.00473	0.04461	0.05477	0.00007	0.00234	—	0.00234	0.00216	—	0.00216	—	7.33805	7.33805	0.00030	0.00006	—	7.36324
Dust From Material Movement	—	—	—	—	—	—	0.00152	0.00152	—	0.00016	0.00016	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03117	0.02761	0.02910	0.48438	0.00000	0.00000	0.09803	0.09803	0.00000	0.02298	0.02298	—	101.615	101.615	0.00422	0.00355	0.34382	103.124
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.03933	0.00864	0.65433	0.25768	0.00370	0.00705	0.14832	0.15537	0.00705	0.04061	0.04766	—	544.170	544.170	0.03016	0.08695	1.22069	572.056

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03117	0.02745	0.03266	0.41337	0.00000	0.00000	0.09803	0.09803	0.00000	0.02298	0.02298	—	96.3321	96.3321	0.00438	0.00355	0.00892	97.5100
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.03862	0.00811	0.68096	0.26032	0.00370	0.00705	0.14832	0.15537	0.00705	0.04061	0.04766	—	544.399	544.399	0.03016	0.08695	0.03168	571.096
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00187	0.00164	0.00214	0.02608	0.00000	0.00000	0.00588	0.00588	0.00000	0.00138	0.00138	—	5.89200	5.89200	0.00026	0.00021	0.00896	5.97142
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00235	0.00051	0.04149	0.01559	0.00022	0.00043	0.00891	0.00933	0.00043	0.00244	0.00286	—	32.8051	32.8051	0.00182	0.00524	0.03162	34.4439
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00034	0.00030	0.00039	0.00476	0.00000	0.00000	0.00107	0.00107	0.00000	0.00025	0.00025	—	0.97549	0.97549	0.00004	0.00004	0.00148	0.98864
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00043	0.00009	0.00757	0.00285	0.00004	0.00008	0.00163	0.00170	0.00008	0.00045	0.00052	—	5.43126	5.43126	0.00030	0.00087	0.00523	5.70258

3.3. San Pascual Site Preparation (2027)

3.3.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.47228	0.39685	3.80845	4.95486	0.00679	0.18489	—	0.18489	0.17010	—	0.17010	—	735.701	735.701	0.02984	0.00597	—	738.226

Dust From Material Movement	—	—	—	—	—	—	0.13793	0.13793	—	0.01490	0.01490	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07117	0.05980	0.57388	0.74662	0.00102	0.02786	—	0.02786	0.02563	—	0.02563	—	110.859	110.859	0.00450	0.00090	—	111.240
Dust From Material Movement	—	—	—	—	—	—	0.02078	0.02078	—	0.00224	0.00224	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01299	0.01091	0.10473	0.13626	0.00019	0.00508	—	0.00508	0.00468	—	0.00468	—	18.3540	18.3540	0.00074	0.00015	—	18.4170
Dust From Material Movement	—	—	—	—	—	—	0.00379	0.00379	—	0.00041	0.00041	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.3.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02985	0.02612	0.03233	0.38170	0.00000	0.00000	0.09803	0.09803	0.00000	0.02298	0.02298	—	94.4927	94.4927	0.00132	0.00355	0.00805	95.5932
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.05767	0.01190	0.98811	0.38017	0.00556	0.01058	0.22248	0.23306	0.01058	0.06091	0.07149	—	800.419	800.419	0.03968	0.13043	0.04419	840.322
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00450	0.00394	0.00487	0.06044	0.00000	0.00000	0.01470	0.01470	0.00000	0.00345	0.00345	—	14.4487	14.4487	0.00020	0.00054	0.02017	14.6335
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00881	0.00187	0.15057	0.05693	0.00084	0.00159	0.03341	0.03500	0.00159	0.00915	0.01074	—	120.580	120.580	0.00598	0.01961	0.11082	126.685
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00082	0.00072	0.00089	0.01103	0.00000	0.00000	0.00268	0.00268	0.00000	0.00063	0.00063	—	2.39215	2.39215	0.00003	0.00009	0.00334	2.42274
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00161	0.00034	0.02748	0.01039	0.00015	0.00029	0.00610	0.00639	0.00029	0.00167	0.00196	—	19.9634	19.9634	0.00099	0.00325	0.01835	20.9742

3.4. San Rafael Grading (2026)

3.4.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51143	0.42974	4.05508	4.97910	0.00679	0.21303	—	0.21303	0.19599	—	0.19599	—	735.346	735.346	0.02983	0.00597	—	737.870

Dust From Material Movement	—	—	—	—	—	—	0.13794	0.13794	—	0.01490	0.01490	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06025	0.05063	0.47772	0.58658	0.00080	0.02510	—	0.02510	0.02309	—	0.02309	—	86.6298	86.6298	0.00351	0.00070	—	86.9271
Dust From Material Movement	—	—	—	—	—	—	0.01625	0.01625	—	0.00176	0.00176	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01100	0.00924	0.08718	0.10705	0.00015	0.00458	—	0.00458	0.00421	—	0.00421	—	14.3426	14.3426	0.00058	0.00012	—	14.3918
Dust From Material Movement	—	—	—	—	—	—	0.00297	0.00297	—	0.00032	0.00032	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.4.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03117	0.02745	0.03266	0.41337	0.00000	0.00000	0.09803	0.09803	0.00000	0.02298	0.02298	—	96.3321	96.3321	0.00438	0.00355	0.00892	97.5100
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.03862	0.00811	0.68096	0.26032	0.00370	0.00705	0.14832	0.15537	0.00705	0.04061	0.04766	—	544.399	544.399	0.03016	0.08695	0.03168	571.096
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00365	0.00321	0.00419	0.05097	0.00000	0.00000	0.01150	0.01150	0.00000	0.00269	0.00269	—	11.5162	11.5162	0.00052	0.00042	0.01752	11.6714
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00459	0.00100	0.08110	0.03048	0.00044	0.00083	0.01741	0.01824	0.00083	0.00477	0.00560	—	64.1190	64.1190	0.00355	0.01024	0.06180	67.3222
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00067	0.00059	0.00076	0.00930	0.00000	0.00000	0.00210	0.00210	0.00000	0.00049	0.00049	—	1.90664	1.90664	0.00009	0.00007	0.00290	1.93234
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00084	0.00018	0.01480	0.00556	0.00008	0.00015	0.00318	0.00333	0.00015	0.00087	0.00102	—	10.6156	10.6156	0.00059	0.00170	0.01023	11.1460

3.5. San Pascual Grading (2027)

3.5.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94457	0.79370	7.61690	9.90972	0.01358	0.36978	—	0.36978	0.34020	—	0.34020	—	1,471.40	1,471.40	0.05969	0.01194	—	1,476.45
Dust From Material Movement	—	—	—	—	—	—	0.27582	0.27582	—	0.02979	0.02979	—	—	—	—	—	—	—

Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94457	0.79370	7.61690	9.90972	0.01358	0.36978	—	0.36978	0.34020	—	0.34020	—	1,471.40	1,471.40	0.05969	0.01194	—	1,476.45
Dust From Material Movement	—	—	—	—	—	—	0.27582	0.27582	—	0.02979	0.02979	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19409	0.16309	1.56512	2.03624	0.00279	0.07598	—	0.07598	0.06990	—	0.06990	—	302.343	302.343	0.01226	0.00245	—	303.380
Dust From Material Movement	—	—	—	—	—	—	0.05668	0.05668	—	0.00612	0.00612	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03542	0.02976	0.28563	0.37161	0.00051	0.01387	—	0.01387	0.01276	—	0.01276	—	50.0563	50.0563	0.00203	0.00041	—	50.2281
Dust From Material Movement	—	—	—	—	—	—	0.01034	0.01034	—	0.00112	0.00112	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.5.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06035	0.05324	0.05175	0.90097	0.00000	0.00000	0.19606	0.19606	0.00000	0.04596	0.04596	—	199.340	199.340	0.00843	0.00711	0.62114	202.291
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.05873	0.01296	0.94790	0.37620	0.00556	0.01058	0.22248	0.23306	0.01058	0.06091	0.07149	—	800.065	800.065	0.03968	0.13016	1.70241	841.547
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05969	0.05225	0.06465	0.76341	0.00000	0.00000	0.19606	0.19606	0.00000	0.04596	0.04596	—	188.985	188.985	0.00265	0.00711	0.01610	191.186
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.05767	0.01190	0.98811	0.38017	0.00556	0.01058	0.22248	0.23306	0.01058	0.06091	0.07149	—	800.419	800.419	0.03968	0.13043	0.04419	840.322
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01227	0.01074	0.01328	0.16485	0.00000	0.00000	0.04010	0.04010	0.00000	0.00940	0.00940	—	39.4055	39.4055	0.00054	0.00146	0.05501	39.9095
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.01201	0.00255	0.20532	0.07763	0.00114	0.00217	0.04555	0.04773	0.00217	0.01248	0.01465	—	164.427	164.427	0.00815	0.02675	0.15112	172.753
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00224	0.00196	0.00242	0.03008	0.00000	0.00000	0.00732	0.00732	0.00000	0.00171	0.00171	—	6.52403	6.52403	0.00009	0.00024	0.00911	6.60747
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00219	0.00047	0.03747	0.01417	0.00021	0.00040	0.00831	0.00871	0.00040	0.00228	0.00267	—	27.2228	27.2228	0.00135	0.00443	0.02502	28.6012

3.6. San Rafael Building Construction (2026)

3.6.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.72690	0.60943	5.72532	6.02432	0.01388	0.21429	—	0.21429	0.19715	—	0.19715	—	1,458.25	1,458.25	0.05915	0.01183	—	1,463.25
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00285	0.00239	0.02241	0.02358	0.00005	0.00084	—	0.00084	0.00077	—	0.00077	—	5.70742	5.70742	0.00023	0.00005	—	5.72701
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00052	0.00044	0.00409	0.00430	0.00001	0.00015	—	0.00015	0.00014	—	0.00014	—	0.94493	0.94493	0.00004	0.00001	—	0.94817
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.6.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.01325	0.00534	0.21564	0.10214	0.00135	0.00270	0.05134	0.05403	0.00135	0.01418	0.01553	—	187.158	187.158	0.00778	0.02669	0.01312	195.320
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00005	0.00002	0.00085	0.00040	0.00001	0.00001	0.00020	0.00021	0.00001	0.00006	0.00006	—	0.73230	0.73230	0.00003	0.00010	0.00085	0.76505
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00001	< 0.000005	0.00015	0.00007	< 0.000005	< 0.000005	0.00004	0.00004	< 0.000005	0.00001	0.00001	—	0.12124	0.12124	0.00001	0.00002	0.00014	0.12666
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.7. San Rafael Building Construction (2027)

3.7.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71286	0.59764	5.52080	6.00557	0.01388	0.20270	—	0.20270	0.18649	—	0.18649	—	1,458.34	1,458.34	0.05916	0.01183	—	1,463.34
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71286	0.59764	5.52080	6.00557	0.01388	0.20270	—	0.20270	0.18649	—	0.18649	—	1,458.34	1,458.34	0.05916	0.01183	—	1,463.34
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16601	0.13918	1.28567	1.39856	0.00323	0.04720	—	0.04720	0.04343	—	0.04343	—	339.613	339.613	0.01378	0.00276	—	340.778
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03030	0.02540	0.23463	0.25524	0.00059	0.00861	—	0.00861	0.00793	—	0.00793	—	56.2267	56.2267	0.00228	0.00046	—	56.4197
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.7.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.01204	0.00561	0.19749	0.09397	0.00135	0.00135	0.05134	0.05268	0.00135	0.01418	0.01553	—	183.442	183.442	0.00778	0.02534	0.47849	191.668
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.01177	0.00534	0.20540	0.09622	0.00135	0.00135	0.05134	0.05268	0.00135	0.01418	0.01553	—	183.543	183.543	0.00778	0.02534	0.01243	191.303
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00280	0.00128	0.04812	0.02216	0.00031	0.00031	0.01191	0.01222	0.00031	0.00329	0.00361	—	42.7292	42.7292	0.00181	0.00590	0.04808	44.5814
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00051	0.00023	0.00878	0.00404	0.00006	0.00006	0.00217	0.00223	0.00006	0.00060	0.00066	—	7.07431	7.07431	0.00030	0.00098	0.00796	7.38097
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.8. San Pascual Building Construction (2027)

3.8.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71286	0.59764	5.52080	6.00557	0.01388	0.20270	—	0.20270	0.18649	—	0.18649	—	1,458.34	1,458.34	0.05916	0.01183	—	1,463.34
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71286	0.59764	5.52080	6.00557	0.01388	0.20270	—	0.20270	0.18649	—	0.18649	—	1,458.34	1,458.34	0.05916	0.01183	—	1,463.34
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25194	0.21122	1.95119	2.12252	0.00491	0.07164	—	0.07164	0.06591	—	0.06591	—	515.412	515.412	0.02091	0.00418	—	517.181
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04598	0.03855	0.35609	0.38736	0.00090	0.01307	—	0.01307	0.01203	—	0.01203	—	85.3323	85.3323	0.00346	0.00069	—	85.6252
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.8.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.02407	0.01122	0.39498	0.18794	0.00270	0.00270	0.10267	0.10537	0.00270	0.02837	0.03106	—	366.885	366.885	0.01556	0.05069	0.95698	383.336
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.02355	0.01069	0.41080	0.19244	0.00270	0.00270	0.10267	0.10537	0.00270	0.02837	0.03106	—	367.087	367.087	0.01556	0.05069	0.02485	382.606
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00851	0.00387	0.14607	0.06726	0.00095	0.00095	0.03615	0.03710	0.00095	0.00999	0.01094	—	129.696	129.696	0.00550	0.01791	0.14593	135.318
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Vendor	0.00155	0.00071	0.02666	0.01228	0.00017	0.00017	0.00660	0.00677	0.00017	0.00182	0.00200	—	21.4726	21.4726	0.00091	0.00297	0.02416	22.4034
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.9. San Rafael Paving (2027)

3.9.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31546	0.26508	2.33306	3.05348	0.00422	0.10688	—	0.10688	0.09833	—	0.09833	—	457.148	457.148	0.01854	0.00371	—	458.717
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01901	0.01598	0.14062	0.18405	0.00025	0.00644	—	0.00644	0.00593	—	0.00593	—	27.5541	27.5541	0.00112	0.00022	—	27.6487
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00347	0.00292	0.02566	0.03359	0.00005	0.00118	—	0.00118	0.00108	—	0.00108	—	4.56190	4.56190	0.00019	0.00004	—	4.57756
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.9.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02012	0.01775	0.01725	0.30032	0.00000	0.00000	0.06535	0.06535	0.00000	0.01532	0.01532	—	66.4466	66.4466	0.00281	0.00237	0.20705	67.4302
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00120	0.00105	0.00130	0.01612	0.00000	0.00000	0.00392	0.00392	0.00000	0.00092	0.00092	—	3.85298	3.85298	0.00005	0.00014	0.00538	3.90226
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00022	0.00019	0.00024	0.00294	0.00000	0.00000	0.00072	0.00072	0.00000	0.00017	0.00017	—	0.63791	0.63791	0.00001	0.00002	0.00089	0.64606
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.10. San Pascual Paving (2027)

3.10.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.31546	0.26508	2.33306	3.05348	0.00422	0.10688	—	0.10688	0.09833	—	0.09833	—	457.148	457.148	0.01854	0.00371	—	458.717
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Roa Equipment	0.00123	0.00104	0.00913	0.01195	0.00002	0.00042	—	0.00042	0.00038	—	0.00038	—	1.78923	1.78923	0.00007	0.00001	—	1.79537
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00023	0.00019	0.00167	0.00218	< 0.000005	0.00008	—	0.00008	0.00007	—	0.00007	—	0.29623	0.29623	0.00001	< 0.000005	—	0.29724
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.10.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01990	0.01742	0.02155	0.25447	0.00000	0.00000	0.06535	0.06535	0.00000	0.01532	0.01532	—	62.9951	62.9951	0.00088	0.00237	0.00537	63.7288
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.00008	0.00007	0.00008	0.00105	0.00000	0.00000	0.00025	0.00025	0.00000	0.00006	0.00006	—	0.25019	0.25019	< 0.000005	0.00001	0.00035	0.25339
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00001	0.00001	0.00002	0.00019	0.00000	0.00000	0.00005	0.00005	0.00000	0.00001	0.00001	—	0.04142	0.04142	< 0.000005	< 0.000005	0.00006	0.04195
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.11. San Pascual Paving (2028)

3.11.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29788	0.25030	2.24963	3.04659	0.00422	0.09512	—	0.09512	0.08751	—	0.08751	—	457.199	457.199	0.01855	0.00371	—	458.768
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	0.01807	0.01518	0.13647	0.18482	0.00026	0.00577	—	0.00577	0.00531	—	0.00531	—	27.7362	27.7362	0.00113	0.00023	—	27.8313
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00330	0.00277	0.02491	0.03373	0.00005	0.00105	—	0.00105	0.00097	—	0.00097	—	4.59204	4.59204	0.00019	0.00004	—	4.60780
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.11.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01935	0.01698	0.01940	0.23981	0.00000	0.00000	0.06535	0.06535	0.00000	0.01532	0.01532	—	61.8721	61.8721	0.00077	0.00237	0.00481	62.6024
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.00117	0.00102	0.00117	0.01521	0.00000	0.00000	0.00395	0.00395	0.00000	0.00092	0.00092	—	3.80890	3.80890	0.00005	0.00014	0.00488	3.85780
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00021	0.00019	0.00021	0.00278	0.00000	0.00000	0.00072	0.00072	0.00000	0.00017	0.00017	—	0.63061	0.63061	0.00001	0.00002	0.00081	0.63870
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.09160	0.09160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

Total	0.09160	0.09160	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.09160	0.09160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.09160	0.09160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.01672	0.01672	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.01672	0.01672	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	4.84384	4.84384	0.00241	0.00029	—	4.99114
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.80195	0.80195	0.00040	0.00005	—	0.82634
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.80195	0.80195	0.00040	0.00005	—	0.82634

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Total	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999

Total	—	—	—	—	—	—	—	—	—	—	—	0.17149	0.00000	0.17149	0.01714	0.00000	—	0.59999
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	0.02839	0.00000	0.02839	0.00284	0.00000	—	0.09933
Total	—	—	—	—	—	—	—	—	—	—	—	0.02839	0.00000	0.02839	0.00284	0.00000	—	0.09933

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
San Rafael Demolition	Demolition	9/1/2026	9/29/2026	5.00000	21.0000	22

San Rafael Site Preparation	Site Preparation	9/30/2026	10/29/2026	5.00000	22.0000	23
San Pascual Site Preparation	Site Preparation	1/1/2027	3/18/2027	5.00000	55.0000	45
San Rafael Grading	Grading	10/30/2026	12/29/2026	5.00000	43.0000	44
San Pascual Grading	Grading	3/19/2027	7/1/2027	5.00000	75.0000	66
San Rafael Building Construction	Building Construction	12/30/2026	4/29/2027	5.00000	87.0000	88
San Pascual Building Construction	Building Construction	7/2/2027	12/29/2027	5.00000	129.000	130
San Rafael Paving	Paving	4/30/2027	5/31/2027	5.00000	22.0000	23
San Pascual Paving	Architectural Coating	12/30/2027	1/31/2028	5.00000	23.0000	24

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
San Rafael Demolition	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Rafael Demolition	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Rafael Demolition	Tractors/Loaders/Backhoes	Diesel	Average	1.000000	8.00000	84.0000	0.37000
San Rafael Demolition	Crawler Tractors	Diesel	Average	1.000000	8.00000	87.0000	0.43000
San Rafael Demolition	Other Construction Equipment	Diesel	Average	1.000000	8.00000	82.0000	0.42000
San Rafael Site Preparation	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Rafael Site Preparation	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Rafael Site Preparation	Crawler Tractors	Diesel	Average	1.000000	8.00000	87.0000	0.43000
San Pascual Site Preparation	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000

San Pascual Site Preparation	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Pascual Site Preparation	Crawler Tractors	Diesel	Average	1.000000	8.00000	87.0000	0.43000
San Rafael Grading	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Rafael Grading	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Rafael Grading	Crawler Tractors	Diesel	Average	1.000000	8.00000	87.0000	0.43000
San Pascual Grading	Excavators	Diesel	Average	2.00000	8.00000	36.0000	0.38000
San Pascual Grading	Skid Steer Loaders	Diesel	Average	2.00000	8.00000	71.0000	0.37000
San Pascual Grading	Crawler Tractors	Diesel	Average	2.00000	8.00000	87.0000	0.43000
San Rafael Building Construction	Cranes	Diesel	Average	1.000000	8.00000	367.000	0.29000
San Rafael Building Construction	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Rafael Building Construction	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Rafael Building Construction	Pumps	Diesel	Average	1.000000	8.00000	11.0000	0.74000
San Pascual Building Construction	Cranes	Diesel	Average	1.000000	8.00000	367.000	0.29000
San Pascual Building Construction	Excavators	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Pascual Building Construction	Skid Steer Loaders	Diesel	Average	1.000000	8.00000	71.0000	0.37000
San Pascual Building Construction	Pumps	Diesel	Average	1.000000	8.00000	11.0000	0.74000
San Rafael Paving	Pavers	Diesel	Average	1.000000	8.00000	81.0000	0.42000
San Rafael Paving	Rollers	Diesel	Average	1.000000	8.00000	36.0000	0.38000
San Pascual Paving	Pavers	Diesel	Average	1.000000	8.00000	81.0000	0.42000
San Pascual Paving	Rollers	Diesel	Average	1.000000	8.00000	36.0000	0.38000

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
San Rafael Demolition	Worker	12.5000	18.5000	LDA,LDT1,LDT2
San Rafael Demolition	Vendor	—	10.2000	HHDT,MHDT
San Rafael Demolition	Hauling	8.00000	20.0000	HHDT
San Rafael Demolition	Onsite truck	—	—	HHDT
San Rafael Site Preparation	Worker	7.50000	18.5000	LDA,LDT1,LDT2
San Rafael Site Preparation	Vendor	—	10.2000	HHDT,MHDT
San Rafael Site Preparation	Hauling	8.00000	20.0000	HHDT
San Rafael Site Preparation	Onsite truck	—	—	HHDT
San Pascual Site Preparation	Worker	7.50000	18.5000	LDA,LDT1,LDT2
San Pascual Site Preparation	Vendor	—	10.2000	HHDT,MHDT
San Pascual Site Preparation	Hauling	12.0000	20.0000	HHDT
San Pascual Site Preparation	Onsite truck	—	—	HHDT
San Rafael Grading	Worker	7.50000	18.5000	LDA,LDT1,LDT2
San Rafael Grading	Vendor	—	10.2000	HHDT,MHDT
San Rafael Grading	Hauling	8.00000	20.0000	HHDT
San Rafael Grading	Onsite truck	—	—	HHDT
San Pascual Grading	Worker	15.0000	18.5000	LDA,LDT1,LDT2
San Pascual Grading	Vendor	—	10.2000	HHDT,MHDT
San Pascual Grading	Hauling	12.0000	20.0000	HHDT
San Pascual Grading	Onsite truck	—	—	HHDT
San Rafael Building Construction	Worker	0.00000	18.5000	LDA,LDT1,LDT2
San Rafael Building Construction	Vendor	6.00000	10.2000	HHDT,MHDT
San Rafael Building Construction	Hauling	0.00000	20.0000	HHDT
San Rafael Building Construction	Onsite truck	—	—	HHDT
San Pascual Building Construction	Worker	0.00000	18.5000	LDA,LDT1,LDT2
San Pascual Building Construction	Vendor	12.0000	10.2000	HHDT,MHDT

San Pascual Building Construction	Hauling	0.00000	20.0000	HHDT
San Pascual Building Construction	Onsite truck	—	—	HHDT
San Rafael Paving	Worker	5.00000	18.5000	LDA,LDT1,LDT2
San Rafael Paving	Vendor	—	10.2000	HHDT,MHDT
San Rafael Paving	Hauling	0.00000	20.0000	HHDT
San Rafael Paving	Onsite truck	—	—	HHDT
San Pascual Paving	Worker	5.00000	18.5000	LDA,LDT1,LDT2
San Pascual Paving	Vendor	—	10.2000	HHDT,MHDT
San Pascual Paving	Hauling	0.00000	20.0000	HHDT
San Pascual Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
San Pascual Paving	0.00000	0.00000	0.00000	0.00000	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
San Rafael Demolition	0.00000	0.00000	0.00000	1.03000	0.00000

San Rafael Site Preparation	—	1,000.000	11.0000	0.00000	0.00000
San Pascual Site Preparation	—	2,000.00	22.0000	0.00000	0.00000
San Rafael Grading	—	2,000.00	33.0000	0.00000	0.00000
San Pascual Grading	—	4,000.00	44.0000	0.00000	0.00000
San Rafael Paving	0.00000	0.00000	0.00000	0.00000	0.00000

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Phase Name	Land Use	Area Paved (acres)	% Asphalt
San Rafael Paving	City Park	0.00000	0%
San Rafael Paving	City Park	0.00000	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00000	1,027.54	0.03300	0.00400
2027	0.00000	1,027.54	0.03300	0.00400
2028	0.00000	1,027.54	0.03300	0.00400

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year

City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
City Park	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
City Park	Wood Fireplaces	0	0
City Park	Gas Fireplaces	0	0
City Park	Propane Fireplaces	0	0
City Park	Electric Fireplaces	0	0
City Park	No Fireplaces	0	0
City Park	Conventional Wood Stoves	0	0
City Park	Catalytic Wood Stoves	0	0
City Park	Non-Catalytic Wood Stoves	0	0
City Park	Pellet Wood Stoves	0	0
City Park	Wood Fireplaces	0	0
City Park	Gas Fireplaces	0	0
City Park	Propane Fireplaces	0	0
City Park	Electric Fireplaces	0	0
City Park	No Fireplaces	0	0
City Park	Conventional Wood Stoves	0	0
City Park	Catalytic Wood Stoves	0	0
City Park	Non-Catalytic Wood Stoves	0	0
City Park	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0.00000	0.00000	0.00000	0.00000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	250.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
City Park	0.00000	66.3262	0.0330	0.0040	0.00000
City Park	0.00000	66.3262	0.0330	0.0040	0.00000

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
City Park	0.00000	2,036,370
City Park	0.00000	2,986,675

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

City Park	0.12900	0.00000
City Park	0.18920	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
City Park	Other commercial A/C and heat pumps	R-410A	2,088.00	0.00180	4.00000	4.00000	18.0000
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430.00	0.03750	1.000000	0.00000	1.000000
City Park	Other commercial A/C and heat pumps	R-410A	2,088.00	0.00180	4.00000	4.00000	18.0000
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430.00	0.03750	1.000000	0.00000	1.000000

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	15.3800	annual days of extreme heat
Extreme Precipitation	7.00000	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00000	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	71.6615
AQ-PM	59.1661
AQ-DPM	88.5128
Drinking Water	87.2237
Lead Risk Housing	73.0183
Pesticides	0.00000
Toxic Releases	69.1423
Traffic	69.3625
Effect Indicators	—
CleanUp Sites	54.2553
Groundwater	14.9261
Haz Waste Facilities/Generators	38.7028
Impaired Water Bodies	33.1583
Solid Waste	52.8981

Sensitive Population	—
Asthma	9.69591
Cardio-vascular	6.54287
Low Birth Weights	24.3136
Socioeconomic Factor Indicators	—
Education	16.2111
Housing	56.4766
Linguistic	46.0008
Poverty	29.2085
Unemployment	51.2624

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	68.77967407
Employed	91.37687668
Median HI	58.24457847
Education	—
Bachelor's or higher	85.38431926
High school enrollment	100
Preschool enrollment	59.16848454
Transportation	—
Auto Access	53.75336841
Active commuting	70.76863852
Social	—
2-parent households	61.91453869
Voting	76.97934043

Neighborhood	—
Alcohol availability	46.27229565
Park access	50.48120108
Retail density	80.73912486
Supermarket access	80.11035545
Tree canopy	90.63261902
Housing	—
Homeownership	17.51571924
Housing habitability	44.87360452
Low-inc homeowner severe housing cost burden	83.60066727
Low-inc renter severe housing cost burden	79.18644938
Uncrowded housing	58.74502759
Health Outcomes	—
Insured adults	52.90645451
Arthritis	0.0
Asthma ER Admissions	98.1
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	41.7
Cognitively Disabled	74.6
Physically Disabled	54.0
Heart Attack ER Admissions	95.3
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0

Obesity	0.0
Pedestrian Injuries	40.5
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	19.9
Elderly	61.3
English Speaking	74.0
Foreign-born	48.3
Outdoor Workers	58.4
Climate Change Adaptive Capacity	—
Impervious Surface Cover	59.6
Traffic Density	60.6
Traffic Access	56.5
Other Indices	—
Hardship	18.2
Other Decision Support	—
2016 Voting	65.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	35.0000

Healthy Places Index Score for Project Location (b)	77.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

8.1. Justifications

Screen	Justification
Characteristics: Utility Information	Located within the City of Pasadena
Construction: Construction Phases	Based on project specific durations provided by the Project Applicant
Construction: Off-Road Equipment	Project specific equipment estimates. AC phase equipment used to represent 2nd paving phase - equipment has been adjusted appropriately.
Construction: Dust From Material Movement	Developer provided export
Construction: Trips and VMT	Per IS/MND, San Rafael site is to have 4 one-way haul trips per day (8 round trips) and San Pascual site is to have 6 one-way haul trips per day (12 round trips). Per Project Applicant, San Rafael site is to have 3 cement truck and San Pascual site is to have 6 cement trucks.
Operations: Vehicle Data	No daily trip generation.

8.2. Project Characteristics

8.2.1. Project Details

Model Parameter	Default Value	New Value
Electric Utility	Southern California Edison	Pasadena Water & Power

8.4. Construction

8.4.2. Off-Road Equipment

Phase Name	Equipment Type	Model Parameter	Default Value	New Value
San Rafael Demolition	Excavators	Number per Day	3.00000	1.000000
San Pascual Grading	Excavators	Number per Day	1.000000	2.00000
San Rafael Building Construction	Cranes	Hours Per Day	7.00000	8.00000
San Pascual Building Construction	Cranes	Hours Per Day	7.00000	8.00000
San Rafael Paving	Rollers	Number per Day	2.00000	1.000000
San Rafael Paving	Rollers	Hours Per Day	6.00000	8.00000

8.4.4. Dust from Material Movement

Phase Name	Model Parameter	Units	Default Value	New Value
San Pascual Site Preparation	Material Exported	Cubic Yards	—	2,000.00
San Pascual Site Preparation	Total Acres Graded	acres	27.5000	22.0000
San Rafael Grading	Material Exported	Cubic Yards	—	2,000.00
San Rafael Grading	Total Acres Graded	acres	21.5000	33.0000
San Pascual Grading	Material Exported	Cubic Yards	—	4,000.00
San Pascual Grading	Total Acres Graded	acres	75.0000	44.0000

8.4.6. Trips and VMT

Phase Name	Trip Type	Model Parameter	Default Value	New Value
San Rafael Demolition	Hauling	One-Way Trips per Day	0.04762	8.00000

San Rafael Site Preparation	Hauling	One-Way Trips per Day	5.68182	8.00000
San Pascual Site Preparation	Hauling	One-Way Trips per Day	4.54545	12.0000
San Rafael Grading	Hauling	One-Way Trips per Day	5.81395	8.00000
San Pascual Grading	Hauling	One-Way Trips per Day	6.66667	12.0000
San Rafael Building Construction	Vendor	One-Way Trips per Day	0.00000	6.00000
San Pascual Building Construction	Vendor	One-Way Trips per Day	0.00000	12.0000
San Pascual Paving	Worker	One-Way Trips per Day	0.00000	5.00000

8.5. Operations

8.5.1. Mobile Sources

8.5.1.1. Vehicle Data

Land Use	Model Parameter	Units	Default Value	New Value
City Park	Weekday Trip Rate	size/day	0.78000	0.00000
City Park	Saturday Trip Rate	size/day	1.96000	0.00000
City Park	Sunday Trip Rate	size/day	2.19000	0.00000
City Park	Weekday Trip Rate	size/day	0.78000	0.00000
City Park	Saturday Trip Rate	size/day	1.96000	0.00000
City Park	Sunday Trip Rate	size/day	2.19000	0.00000

16364 - Arroyo Secco Water Use (LA) Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	16364 - Arroyo Secco Water Use (LA)
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50000
Precipitation (days)	7.20000
Location	34.12126499161808, -118.16779396700508
County	Los Angeles-South Coast
City	Los Angeles
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	3962
EDFZ	16
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.41

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Recreational	1.000000	User Defined Unit	0.00000	0.00000	0.00000	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.3. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.00067	0.00000	-0.00005	-0.00001	-0.00001	-0.00001	> -0.000005	> -0.000005	> -0.000005	0.00000	-1.36365	-1.36365	0.00000	0.00000	0.00000	-1.36365

2.4. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	-8.23651	-8.23651	—	—	—	-8.23651
Total	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	-8.23651	-8.23651	—	—	—	-8.23651
Total	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

Vegetation	—	0.00000	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	-8.23651	-8.23651	—	—	—	-8.23651
Total	0.00000	0.00000	-0.00365	0.00000	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	0.00000	-8.23651	-8.23651	0.00000	0.00000	0.00000	-8.23651
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.00067	—	-0.00005	-0.00001	-0.00001	-0.00001	> -0.000005	> -0.000005	> -0.000005	—	-1.36365	-1.36365	—	—	—	-1.36365
Total	0.00000	0.00000	-0.00067	0.00000	-0.00005	-0.00001	-0.00001	-0.00001	> -0.000005	> -0.000005	> -0.000005	0.00000	-1.36365	-1.36365	0.00000	0.00000	0.00000	-1.36365

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landsca Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm(	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal Live Oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European Elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California redbud	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	2.47367	2.47367	—	—	—	2.47367
European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	0.36844	0.36844	—	—	—	0.36844

Mexican fan palm(	—	—	—	—	—	—	—	—	—	—	—	—	0.86715	0.86715	—	—	—	0.86715
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-0.69202	-0.69202	—	—	—	-0.69202
Coastal Live Oak	—	—	—	—	—	—	—	—	—	—	—	—	-2.66217	-2.66217	—	—	—	-2.66217
European Elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-1.96138	-1.96138	—	—	—	-1.96138
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	-5.57524	-5.57524	—	—	—	-5.57524
California redbud	—	—	—	—	—	—	—	—	—	—	—	—	-1.05496	-1.05496	—	—	—	-1.05496
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-8.23651	-8.23651	—	—	—	-8.23651
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00192	—	0.00013	0.00016	0.00016	0.00033	0.00004	0.00004	0.00009	—	—	—	—	—	—	—
European black elderberry	—	—	0.00049	—	0.00004	0.00027	0.00027	0.00054	0.00007	0.00007	0.00015	—	—	—	—	—	—	—
Mexican fan palm(	—	—	0.00240	—	0.00019	0.00011	0.00011	0.00021	0.00003	0.00003	0.00006	—	—	—	—	—	—	—
California sycamore	—	—	-0.00120	—	-0.00008	-0.00009	-0.00009	-0.00018	-0.00002	-0.00002	-0.00005	—	—	—	—	—	—	—

Coastal Live Oak	—	—	-0.00243	—	-0.00017	-0.00019	-0.00019	-0.00038	-0.00005	-0.00005	-0.00010	—	—	—	—	—	—	—
European Elderberry	—	—	-0.00090	—	-0.00007	-0.00005	-0.00005	-0.00009	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
Toyon	—	—	-0.00283	—	-0.00021	-0.00018	-0.00018	-0.00036	-0.00005	-0.00005	-0.00010	—	—	—	—	—	—	—
California redbud	—	—	-0.00111	—	-0.00008	-0.00007	-0.00007	-0.00013	-0.00002	-0.00002	-0.00004	—	—	—	—	—	—	—
Subtotal	—	—	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	-8.23651	-8.23651	—	—	—	-8.23651
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm(	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal Live Oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000

European Elderber	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California redbud	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	2.47367	2.47367	—	—	—	2.47367
European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	0.36844	0.36844	—	—	—	0.36844
Mexican fan palm(	—	—	—	—	—	—	—	—	—	—	—	—	0.86715	0.86715	—	—	—	0.86715
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-0.69202	-0.69202	—	—	—	-0.69202
Coastal Live Oak	—	—	—	—	—	—	—	—	—	—	—	—	-2.66217	-2.66217	—	—	—	-2.66217
European Elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-1.96138	-1.96138	—	—	—	-1.96138
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	-5.57524	-5.57524	—	—	—	-5.57524
California redbud	—	—	—	—	—	—	—	—	—	—	—	—	-1.05496	-1.05496	—	—	—	-1.05496
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-8.23651	-8.23651	—	—	—	-8.23651

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00192	—	0.00013	0.00016	0.00016	0.00033	0.00004	0.00004	0.00009	—	—	—	—	—	—	—
European black elderberry	—	—	0.00049	—	0.00004	0.00027	0.00027	0.00054	0.00007	0.00007	0.00015	—	—	—	—	—	—	—
Mexican fan palm(	—	—	0.00240	—	0.00019	0.00011	0.00011	0.00021	0.00003	0.00003	0.00006	—	—	—	—	—	—	—
California sycamore	—	—	-0.00120	—	-0.00008	-0.00009	-0.00009	-0.00018	-0.00002	-0.00002	-0.00005	—	—	—	—	—	—	—
Coastal Live Oak	—	—	-0.00243	—	-0.00017	-0.00019	-0.00019	-0.00038	-0.00005	-0.00005	-0.00010	—	—	—	—	—	—	—
European Elderberry	—	—	-0.00090	—	-0.00007	-0.00005	-0.00005	-0.00009	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
Toyon	—	—	-0.00283	—	-0.00021	-0.00018	-0.00018	-0.00036	-0.00005	-0.00005	-0.00010	—	—	—	—	—	—	—
California redbud	—	—	-0.00111	—	-0.00008	-0.00007	-0.00007	-0.00013	-0.00002	-0.00002	-0.00004	—	—	—	—	—	—	—
Subtotal	—	—	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.00365	—	-0.00025	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	-8.23651	-8.23651	—	—	—	-8.23651
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000

European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm(	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal Live Oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European Elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California redbud	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	0.40954	0.40954	—	—	—	0.40954
European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	0.06100	0.06100	—	—	—	0.06100
Mexican fan palm(	—	—	—	—	—	—	—	—	—	—	—	—	0.14357	0.14357	—	—	—	0.14357
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-0.11457	-0.11457	—	—	—	-0.11457

Coastal Live Oak	—	—	—	—	—	—	—	—	—	—	—	—	-0.44075	-0.44075	—	—	—	-0.4407
European Elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.32473	-0.32473	—	—	—	-0.32473
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	-0.92304	-0.92304	—	—	—	-0.92304
California redbud	—	—	—	—	—	—	—	—	—	—	—	—	-0.17466	-0.17466	—	—	—	-0.17466
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-1.36365	-1.36365	—	—	—	-1.36365
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00035	—	0.00002	0.00003	0.00003	0.00006	0.00001	0.00001	0.00002	—	—	—	—	—	—	—
European black elderberry	—	—	0.00009	—	0.00001	0.00005	0.00005	0.00010	0.00001	0.00001	0.00003	—	—	—	—	—	—	—
Mexican fan palm(	—	—	0.00044	—	0.00004	0.00002	0.00002	0.00004	0.00001	0.00001	0.00001	—	—	—	—	—	—	—
California sycamore	—	—	-0.00022	—	-0.00002	-0.00002	-0.00002	-0.00003	> -0.000005	> -0.000005	-0.00001	—	—	—	—	—	—	—
Coastal Live Oak	—	—	-0.00044	—	-0.00003	-0.00003	-0.00003	-0.00007	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
European Elderberry	—	—	-0.00016	—	-0.00001	-0.00001	-0.00001	-0.00002	> -0.000005	> -0.000005	> -0.000005	—	—	—	—	—	—	—
Toyon	—	—	-0.00052	—	-0.00004	-0.00003	-0.00003	-0.00007	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—

Californi redbud	—	—	-0.00020	—	-0.00001	-0.00001	-0.00001	-0.00002	> -0.000005	> -0.000005	-0.00001	—	—	—	—	—	—	—
Subtotal	—	—	-0.00067	—	-0.00005	-0.00001	-0.00001	-0.00001	> -0.000005	> -0.000005	> -0.000005	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.00067	—	-0.00005	-0.00001	-0.00001	-0.00001	> -0.000005	> -0.000005	> -0.000005	—	-1.36365	-1.36365	—	—	—	-1.36365

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
User Defined Recreational	Wood Fireplaces	0	0
User Defined Recreational	Gas Fireplaces	0	0
User Defined Recreational	Propane Fireplaces	0	0
User Defined Recreational	Electric Fireplaces	0	0
User Defined Recreational	No Fireplaces	0	0
User Defined Recreational	Conventional Wood Stoves	0	0
User Defined Recreational	Catalytic Wood Stoves	0	0
User Defined Recreational	Non-Catalytic Wood Stoves	0	0
User Defined Recreational	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0.00000	0.00000	0.00000	0.00000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	250.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Recreational	0.00000	348.637	0.0330	0.0040	0.00000

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Recreational	0.00000	0.00000

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

User Defined Recreational	0.00000	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
California sycamore	6.00000	0.00000	0.00000
Coastal Live Oak	10.00000	0.00000	0.00000
European Elderberry	16.0000	0.00000	0.00000
Toyon	12.0000	0.00000	0.00000
California redbud	4.00000	0.00000	0.00000
Coastal live oak	-2.00000	0.00000	0.00000
European black elderberry	-1.000000	0.00000	0.00000
European black elderberry	-1.000000	0.00000	0.00000
European black elderberry	-1.000000	0.00000	0.00000
European black elderberry	-1.000000	0.00000	0.00000
Mexican fan palm(	-5.00000	0.00000	0.00000

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	—	annual days of extreme heat
Extreme Precipitation	—	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	—	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	71.6615
AQ-PM	60.7716
AQ-DPM	72.2838
Drinking Water	87.5359
Lead Risk Housing	78.2105
Pesticides	0.00000
Toxic Releases	70.0800
Traffic	71.2875
Effect Indicators	—
CleanUp Sites	37.5513
Groundwater	0.00000
Haz Waste Facilities/Generators	21.9590
Impaired Water Bodies	23.8765
Solid Waste	0.00000

Sensitive Population	—
Asthma	45.9621
Cardio-vascular	38.8709
Low Birth Weights	66.0508
Socioeconomic Factor Indicators	—
Education	68.0334
Housing	57.3764
Linguistic	73.0951
Poverty	65.4146
Unemployment	78.9693

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	30.32208392
Employed	74.81072758
Median HI	40.16424997
Education	—
Bachelor's or higher	34.23585269
High school enrollment	100
Preschool enrollment	1.873476197
Transportation	—
Auto Access	73.42486847
Active commuting	76.22225074
Social	—
2-parent households	10.50943154
Voting	44.30899525

Neighborhood	—
Alcohol availability	35.77569614
Park access	81.35506224
Retail density	51.54625946
Supermarket access	43.68022584
Tree canopy	76.47889131
Housing	—
Homeownership	12.34441165
Housing habitability	6.13370974
Low-inc homeowner severe housing cost burden	1.62966765
Low-inc renter severe housing cost burden	56.07596561
Uncrowded housing	21.00603105
Health Outcomes	—
Insured adults	20.53124599
Arthritis	83.7
Asthma ER Admissions	47.4
High Blood Pressure	89.1
Cancer (excluding skin)	80.0
Asthma	58.2
Coronary Heart Disease	72.1
Chronic Obstructive Pulmonary Disease	68.2
Diagnosed Diabetes	39.3
Life Expectancy at Birth	28.5
Cognitively Disabled	74.6
Physically Disabled	77.4
Heart Attack ER Admissions	54.2
Mental Health Not Good	37.4
Chronic Kidney Disease	64.9

Obesity	34.9
Pedestrian Injuries	79.2
Physical Health Not Good	36.4
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	45.1
Current Smoker	45.1
No Leisure Time for Physical Activity	39.0
Climate Change Exposures	—
Wildfire Risk	67.9
SLR Inundation Area	0.0
Children	28.6
Elderly	88.2
English Speaking	20.1
Foreign-born	69.7
Outdoor Workers	23.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	32.8
Traffic Density	71.3
Traffic Access	61.1
Other Indices	—
Hardship	68.0
Other Decision Support	—
2016 Voting	31.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	70.0000

Healthy Places Index Score for Project Location (b)	33.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

16364 - Arroyo Secco Water Use (Pasadena) Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	16364 - Arroyo Secco Water Use (Pasadena)
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50000
Precipitation (days)	7.20000
Location	34.12454768510693, -118.16761610787265
County	Los Angeles-South Coast
City	Pasadena
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4969
EDFZ	7
Electric Utility	Los Angeles Department of Water & Power
Gas Utility	Southern California Gas
App Version	2022.1.1.41

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Recreational	1.000000	User Defined Unit	0.00000	0.00000	0.00000	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.3. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	-0.00245	0.00000	-0.00018	-0.00018	-0.00018	-0.00037	-0.00005	-0.00005	-0.00010	0.00000	-3.17521	-3.17521	0.00000	0.00000	0.00000	-3.17521

2.4. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	-19.1785	-19.1785	—	—	—	-19.1785
Total	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	-19.1785	-19.1785	—	—	—	-19.1785
Total	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

Vegetation	—	0.00000	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	-19.1785	-19.1785	—	—	—	-19.1785
Total	0.00000	0.00000	-0.01345	0.00000	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	0.00000	-19.1785	-19.1785	0.00000	0.00000	0.00000	-19.1785
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	-0.00245	—	-0.00018	-0.00018	-0.00018	-0.00037	-0.00005	-0.00005	-0.00010	—	-3.17521	-3.17521	—	—	—	-3.17521
Total	0.00000	0.00000	-0.00245	0.00000	-0.00018	-0.00018	-0.00018	-0.00037	-0.00005	-0.00005	-0.00010	0.00000	-3.17521	-3.17521	0.00000	0.00000	0.00000	-3.17521

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landsca Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Willow	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.50914	-0.50914	—	—	—	-0.50914
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	-6.92165	-6.92165	—	—	—	-6.92165
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-1.03803	-1.03803	—	—	—	-1.03803
Willow	—	—	—	—	—	—	—	—	—	—	—	—	-10.7096	-10.7096	—	—	—	-10.7096
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-19.1785	-19.1785	—	—	—	-19.1785
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

European black elderberry	—	—	0.00059	—	0.00002	0.00001	0.00001	0.00001	< 0.000005	< 0.000005	< 0.000005	—	—	—	—	—	—	—
Coastal live oak	—	—	-0.00632	—	-0.00045	-0.00050	-0.00050	-0.00100	-0.00014	-0.00014	-0.00027	—	—	—	—	—	—	—
California sycamore	—	—	-0.00180	—	-0.00013	-0.00013	-0.00013	-0.00026	-0.00004	-0.00004	-0.00007	—	—	—	—	—	—	—
Willow	—	—	-0.00592	—	-0.00042	-0.00038	-0.00038	-0.00075	-0.00010	-0.00010	-0.00020	—	—	—	—	—	—	—
Subtotal	—	—	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	-19.1785	-19.1785	—	—	—	-19.1785
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Willow	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.50914	-0.50914	—	—	—	-0.50914
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	-6.92165	-6.92165	—	—	—	-6.92165
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-1.03803	-1.03803	—	—	—	-1.03803
Willow	—	—	—	—	—	—	—	—	—	—	—	—	-10.7096	-10.7096	—	—	—	-10.7096
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-19.1785	-19.1785	—	—	—	-19.1785
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	—	0.00059	—	0.00002	0.00001	0.00001	0.00001	< 0.000005	< 0.000005	< 0.000005	—	—	—	—	—	—	—
Coastal live oak	—	—	-0.00632	—	-0.00045	-0.00050	-0.00050	-0.00100	-0.00014	-0.00014	-0.00027	—	—	—	—	—	—	—
California sycamore	—	—	-0.00180	—	-0.00013	-0.00013	-0.00013	-0.00026	-0.00004	-0.00004	-0.00007	—	—	—	—	—	—	—
Willow	—	—	-0.00592	—	-0.00042	-0.00038	-0.00038	-0.00075	-0.00010	-0.00010	-0.00020	—	—	—	—	—	—	—
Subtotal	—	—	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.01345	—	-0.00098	-0.00100	-0.00100	-0.00200	-0.00027	-0.00027	-0.00055	—	-19.1785	-19.1785	—	—	—	-19.1785
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

European black elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Willow	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.08429	-0.08429	—	—	—	-0.08429
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	-1.14596	-1.14596	—	—	—	-1.14596
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-0.17186	-0.17186	—	—	—	-0.17186
Willow	—	—	—	—	—	—	—	—	—	—	—	—	-1.77310	-1.77310	—	—	—	-1.77310
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-3.17521	-3.17521	—	—	—	-3.17521
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
European black elderberry	—	—	0.00011	—	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	—	—	—	—	—	—	—
Coastal live oak	—	—	-0.00115	—	-0.00008	-0.00009	-0.00009	-0.00018	-0.00002	-0.00002	-0.00005	—	—	—	—	—	—	—

California	—	—	-0.00033	—	-0.00002	-0.00002	-0.00002	-0.00005	-0.00001	-0.00001	-0.00001	—	—	—	—	—	—	—
Willow	—	—	-0.00108	—	-0.00008	-0.00007	-0.00007	-0.00014	-0.00002	-0.00002	-0.00004	—	—	—	—	—	—	—
Subtotal	—	—	-0.00245	—	-0.00018	-0.00018	-0.00018	-0.00037	-0.00005	-0.00005	-0.00010	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	-0.00245	—	-0.00018	-0.00018	-0.00018	-0.00037	-0.00005	-0.00005	-0.00010	—	-3.17521	-3.17521	—	—	—	-3.17521

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
User Defined Recreational	Wood Fireplaces	0	0
User Defined Recreational	Gas Fireplaces	0	0
User Defined Recreational	Propane Fireplaces	0	0
User Defined Recreational	Electric Fireplaces	0	0
User Defined Recreational	No Fireplaces	0	0
User Defined Recreational	Conventional Wood Stoves	0	0
User Defined Recreational	Catalytic Wood Stoves	0	0
User Defined Recreational	Non-Catalytic Wood Stoves	0	0

User Defined Recreational	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0.00000	0.00000	0.00000	0.00000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	250.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Recreational	0.00000	690.400	0.0489	0.0069	0.00000

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Recreational	0.00000	0.00000

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Recreational	0.00000	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
European black elderberry	9.00000	0.00000	0.00000
Coastal live oak	26.0000	0.00000	0.00000
California sycamore	9.00000	0.00000	0.00000
Willow	17.0000	0.00000	0.00000
European black elderberry	-6.00000	0.00000	0.00000

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	—	annual days of extreme heat
Extreme Precipitation	—	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	—	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	74.1008
AQ-PM	57.1126
AQ-DPM	78.5190
Drinking Water	71.1253
Lead Risk Housing	55.5009
Pesticides	0.00000
Toxic Releases	67.9295
Traffic	59.8625
Effect Indicators	—
CleanUp Sites	88.0366
Groundwater	0.00000
Haz Waste Facilities/Generators	81.6678
Impaired Water Bodies	33.1583
Solid Waste	35.7159
Sensitive Population	—
Asthma	14.5439
Cardio-vascular	7.73928
Low Birth Weights	50.7185

Socioeconomic Factor Indicators	—
Education	24.1205
Housing	51.3561
Linguistic	22.1681
Poverty	20.3769
Unemployment	68.4019

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	97.8570512
Employed	97.20261773
Median HI	98.13935583
Education	—
Bachelor's or higher	97.95970743
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	98.98626973
Active commuting	30.15526755
Social	—
2-parent households	85.62812781
Voting	80.11035545
Neighborhood	—
Alcohol availability	87.87373284
Park access	81.35506224
Retail density	60.16938278

Supermarket access	25.68972154
Tree canopy	86.68035416
Housing	—
Homeownership	98.72962915
Housing habitability	81.38072629
Low-inc homeowner severe housing cost burden	96.68933658
Low-inc renter severe housing cost burden	26.31849095
Uncrowded housing	86.21840113
Health Outcomes	—
Insured adults	97.11279353
Arthritis	32.9
Asthma ER Admissions	91.6
High Blood Pressure	17.7
Cancer (excluding skin)	5.1
Asthma	98.2
Coronary Heart Disease	40.3
Chronic Obstructive Pulmonary Disease	91.4
Diagnosed Diabetes	75.2
Life Expectancy at Birth	69.8
Cognitively Disabled	98.4
Physically Disabled	91.7
Heart Attack ER Admissions	93.6
Mental Health Not Good	99.4
Chronic Kidney Disease	55.3
Obesity	89.8
Pedestrian Injuries	19.6
Physical Health Not Good	95.1
Stroke	70.4

Health Risk Behaviors	—
Binge Drinking	63.5
Current Smoker	99.4
No Leisure Time for Physical Activity	99.0
Climate Change Exposures	—
Wildfire Risk	100.0
SLR Inundation Area	0.0
Children	29.7
Elderly	9.9
English Speaking	95.4
Foreign-born	35.4
Outdoor Workers	85.0
Climate Change Adaptive Capacity	—
Impervious Surface Cover	89.0
Traffic Density	91.0
Traffic Access	54.8
Other Indices	—
Hardship	2.3
Other Decision Support	—
2016 Voting	80.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	41.0000
Healthy Places Index Score for Project Location (b)	99.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

16364 - Arroyo Secco Water Use (South Pasadena) Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	16364 - Arroyo Secco Water Use (South Pasadena)
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50000
Precipitation (days)	7.20000
Location	34.12065303999505, -118.16760703700828
County	Los Angeles-South Coast
City	South Pasadena
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4945
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.41

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Recreational	1.000000	User Defined Unit	0.00000	0.00000	0.00000	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.3. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00000	0.00000	0.00755	0.00000	0.00060	0.00040	0.00040	0.00080	0.00011	0.00011	0.00022	0.00000	-0.72508	-0.72508	0.00000	0.00000	0.00000	-0.72508

2.4. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	-4.37954	-4.37954	—	—	—	-4.37954
Total	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	-4.37954	-4.37954	—	—	—	-4.37954
Total	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

Vegetation	—	0.00000	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	-4.37954	-4.37954	—	—	—	-4.37954
Total	0.00000	0.00000	0.04137	0.00000	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	0.00000	-4.37954	-4.37954	0.00000	0.00000	0.00000	-4.37954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Area	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Energy	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Water	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Vegetation	—	0.00000	0.00755	—	0.00060	0.00040	0.00040	0.00080	0.00011	0.00011	0.00022	—	-0.72508	-0.72508	—	—	—	-0.72508
Total	0.00000	0.00000	0.00755	0.00000	0.00060	0.00040	0.00040	0.00080	0.00011	0.00011	0.00022	0.00000	-0.72508	-0.72508	0.00000	0.00000	0.00000	-0.72508

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landsca Equipment	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	0.00000	—	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
User Defined Recreational	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000
Total	—	—	—	—	—	—	—	—	—	—	—	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Willow spp	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Carob	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Brazilian Peppertree	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Chinese Elm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Shamel Ash	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California Sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	2.89160	2.89160	—	—	—	2.89160
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	7.40447	7.40447	—	—	—	7.40447
Willow spp	—	—	—	—	—	—	—	—	—	—	—	—	-29.5355	-29.5355	—	—	—	-29.5355
European elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.85746	-0.85746	—	—	—	-0.85746
Mexican fan palm	—	—	—	—	—	—	—	—	—	—	—	—	13.3541	13.3541	—	—	—	13.3541
Carob	—	—	—	—	—	—	—	—	—	—	—	—	0.14548	0.14548	—	—	—	0.14548
Brazilian Peppertree	—	—	—	—	—	—	—	—	—	—	—	—	0.31708	0.31708	—	—	—	0.31708
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	0.42886	0.42886	—	—	—	0.42886
Chinese Elm	—	—	—	—	—	—	—	—	—	—	—	—	1.93425	1.93425	—	—	—	1.93425
Shamel Ash	—	—	—	—	—	—	—	—	—	—	—	—	0.80630	0.80630	—	—	—	0.80630
California Sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-1.26868	-1.26868	—	—	—	-1.26868
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-4.37954	-4.37954	—	—	—	-4.37954
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	—	0.01088	—	0.00073	0.00096	0.00096	0.00192	0.00026	0.00026	0.00052	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00523	—	0.00036	0.00047	0.00047	0.00094	0.00013	0.00013	0.00026	—	—	—	—	—	—	—

Willow spp	—	—	-0.01742	—	-0.00122	-0.00119	-0.00119	-0.00238	-0.00032	-0.00032	-0.00065	—	—	—	—	—	—	—
European elderberry	—	—	-0.00007	—	-0.00001	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	—	—	—	—	—	—	—
Mexican fan palm	—	—	0.03697	—	0.00297	0.00166	0.00166	0.00331	0.00045	0.00045	0.00090	—	—	—	—	—	—	—
Carob	—	—	0.00094	—	0.00007	0.00006	0.00006	0.00012	0.00002	0.00002	0.00003	—	—	—	—	—	—	—
Brazilian Peppertree	—	—	0.00495	—	0.00037	0.00029	0.00029	0.00059	0.00008	0.00008	0.00016	—	—	—	—	—	—	—
Toyon	—	—	0.00088	—	0.00007	0.00006	0.00006	0.00011	0.00002	0.00002	0.00003	—	—	—	—	—	—	—
Chinese Elm	—	—	0.00063	—	0.00005	0.00002	0.00002	0.00004	0.00001	0.00001	0.00001	—	—	—	—	—	—	—
Shamel Ash	—	—	0.00057	—	0.00004	0.00003	0.00003	0.00006	0.00001	0.00001	0.00002	—	—	—	—	—	—	—
California Sycamore	—	—	-0.00220	—	-0.00015	-0.00016	-0.00016	-0.00033	-0.00004	-0.00004	-0.00009	—	—	—	—	—	—	—
Subtotal	—	—	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	-4.37954	-4.37954	—	—	—	-4.37954
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000

Willow spp	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Carob	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Brazilian Peppertree	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Chinese Elm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Shamel Ash	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California Sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	2.89160	2.89160	—	—	—	2.89160
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	7.40447	7.40447	—	—	—	7.40447
Willow spp	—	—	—	—	—	—	—	—	—	—	—	—	-29.5355	-29.5355	—	—	—	-29.5355
European elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.85746	-0.85746	—	—	—	-0.85746

Mexican fan palm	—	—	—	—	—	—	—	—	—	—	—	—	13.3541	13.3541	—	—	—	13.3541
Carob	—	—	—	—	—	—	—	—	—	—	—	—	0.14548	0.14548	—	—	—	0.14548
Brazilian Peppertree	—	—	—	—	—	—	—	—	—	—	—	—	0.31708	0.31708	—	—	—	0.31708
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	0.42886	0.42886	—	—	—	0.42886
Chinese Elm	—	—	—	—	—	—	—	—	—	—	—	—	1.93425	1.93425	—	—	—	1.93425
Shamel Ash	—	—	—	—	—	—	—	—	—	—	—	—	0.80630	0.80630	—	—	—	0.80630
California Sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-1.26868	-1.26868	—	—	—	-1.26868
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-4.37954	-4.37954	—	—	—	-4.37954
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	—	0.01088	—	0.00073	0.00096	0.00096	0.00192	0.00026	0.00026	0.00052	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00523	—	0.00036	0.00047	0.00047	0.00094	0.00013	0.00013	0.00026	—	—	—	—	—	—	—
Willow spp	—	—	-0.01742	—	-0.00122	-0.00119	-0.00119	-0.00238	-0.00032	-0.00032	-0.00065	—	—	—	—	—	—	—
European elderberry	—	—	-0.00007	—	-0.00001	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	—	—	—	—	—	—	—
Mexican fan palm	—	—	0.03697	—	0.00297	0.00166	0.00166	0.00331	0.00045	0.00045	0.00090	—	—	—	—	—	—	—
Carob	—	—	0.00094	—	0.00007	0.00006	0.00006	0.00012	0.00002	0.00002	0.00003	—	—	—	—	—	—	—
Brazilian Peppertree	—	—	0.00495	—	0.00037	0.00029	0.00029	0.00059	0.00008	0.00008	0.00016	—	—	—	—	—	—	—

Toyon	—	—	0.00088	—	0.00007	0.00006	0.00006	0.00011	0.00002	0.00002	0.00003	—	—	—	—	—	—	—
Chinese Elm	—	—	0.00063	—	0.00005	0.00002	0.00002	0.00004	0.00001	0.00001	0.00001	—	—	—	—	—	—	—
Shamel Ash	—	—	0.00057	—	0.00004	0.00003	0.00003	0.00006	0.00001	0.00001	0.00002	—	—	—	—	—	—	—
California Sycamore	—	—	-0.00220	—	-0.00015	-0.00016	-0.00016	-0.00033	-0.00004	-0.00004	-0.00009	—	—	—	—	—	—	—
Subtotal	—	—	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	0.04137	—	0.00328	0.00220	0.00220	0.00440	0.00060	0.00060	0.00120	—	-4.37954	-4.37954	—	—	—	-4.37954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Coastal live oak	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Willow spp	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
European elderberry	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Mexican fan palm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Carob	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Brazilian Peppertree	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Toyon	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Chinese Elm	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000

Shamel Ash	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
California Sycamore	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Subtotal	—	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	—	—	—	0.00000
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	—	—	—	—	—	—	—	—	—	—	—	0.47874	0.47874	—	—	—	0.47874
Coastal live oak	—	—	—	—	—	—	—	—	—	—	—	—	1.22589	1.22589	—	—	—	1.22589
Willow spp	—	—	—	—	—	—	—	—	—	—	—	—	-4.88994	-4.88994	—	—	—	-4.88994
European elderberry	—	—	—	—	—	—	—	—	—	—	—	—	-0.14196	-0.14196	—	—	—	-0.14196
Mexican fan palm	—	—	—	—	—	—	—	—	—	—	—	—	2.21092	2.21092	—	—	—	2.21092
Carob	—	—	—	—	—	—	—	—	—	—	—	—	0.02409	0.02409	—	—	—	0.02409
Brazilian Peppertree	—	—	—	—	—	—	—	—	—	—	—	—	0.05250	0.05250	—	—	—	0.05250
Toyon	—	—	—	—	—	—	—	—	—	—	—	—	0.07100	0.07100	—	—	—	0.07100
Chinese Elm	—	—	—	—	—	—	—	—	—	—	—	—	0.32024	0.32024	—	—	—	0.32024
Shamel Ash	—	—	—	—	—	—	—	—	—	—	—	—	0.13349	0.13349	—	—	—	0.13349
California Sycamore	—	—	—	—	—	—	—	—	—	—	—	—	-0.21004	-0.21004	—	—	—	-0.21004

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	-0.72508	-0.72508	—	—	—	-0.72508
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California sycamore	—	—	0.00199	—	0.00013	0.00018	0.00018	0.00035	0.00005	0.00005	0.00010	—	—	—	—	—	—	—
Coastal live oak	—	—	0.00095	—	0.00007	0.00009	0.00009	0.00017	0.00002	0.00002	0.00005	—	—	—	—	—	—	—
Willow spp	—	—	-0.00318	—	-0.00022	-0.00022	-0.00022	-0.00043	-0.00006	-0.00006	-0.00012	—	—	—	—	—	—	—
European elderberry	—	—	-0.00001	—	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	> -0.000005	—	—	—	—	—	—	—
Mexican fan palm	—	—	0.00675	—	0.00054	0.00030	0.00030	0.00060	0.00008	0.00008	0.00016	—	—	—	—	—	—	—
Carob	—	—	0.00017	—	0.00001	0.00001	0.00001	0.00002	< 0.000005	< 0.000005	0.00001	—	—	—	—	—	—	—
Brazilian Peppertree	—	—	0.00090	—	0.00007	0.00005	0.00005	0.00011	0.00001	0.00001	0.00003	—	—	—	—	—	—	—
Toyon	—	—	0.00016	—	0.00001	0.00001	0.00001	0.00002	< 0.000005	< 0.000005	0.00001	—	—	—	—	—	—	—
Chinese Elm	—	—	0.00011	—	0.00001	< 0.000005	< 0.000005	0.00001	< 0.000005	< 0.000005	< 0.000005	—	—	—	—	—	—	—
Shamel Ash	—	—	0.00010	—	0.00001	0.00001	0.00001	0.00001	< 0.000005	< 0.000005	< 0.000005	—	—	—	—	—	—	—
California Sycamore	—	—	-0.00040	—	-0.00003	-0.00003	-0.00003	-0.00006	-0.00001	-0.00001	-0.00002	—	—	—	—	—	—	—
Subtotal	—	—	0.00755	—	0.00060	0.00040	0.00040	0.00080	0.00011	0.00011	0.00022	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.00000	0.00755	—	0.00060	0.00040	0.00040	0.00080	0.00011	0.00011	0.00022	—	-0.72508	-0.72508	—	—	—	-0.72508

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
User Defined Recreational	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
User Defined Recreational	Wood Fireplaces	0	0
User Defined Recreational	Gas Fireplaces	0	0
User Defined Recreational	Propane Fireplaces	0	0
User Defined Recreational	Electric Fireplaces	0	0
User Defined Recreational	No Fireplaces	0	0
User Defined Recreational	Conventional Wood Stoves	0	0
User Defined Recreational	Catalytic Wood Stoves	0	0
User Defined Recreational	Non-Catalytic Wood Stoves	0	0
User Defined Recreational	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0.00000	0.00000	0.00000	0.00000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	250.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
User Defined Recreational	0.00000	348.637	0.0330	0.0040	0.00000

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
User Defined Recreational	0.00000	0.00000

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
User Defined Recreational	0.00000	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
Willow spp	72.0000	0.00000	0.00000
European elderberry	10.00000	0.00000	0.00000

Coastal live oak	14.0000	0.00000	0.00000
California Sycamore	11.0000	0.00000	0.00000
California sycamore	-6.00000	0.00000	0.00000
Coastal live oak	-9.00000	0.00000	0.00000
Willow spp	-12.0000	0.00000	0.00000
European elderberry	-4.00000	0.00000	0.00000
Mexican fan palm	-77.0000	0.00000	0.00000
Carob	-2.00000	0.00000	0.00000
Brazilian Peppertree	-5.00000	0.00000	0.00000
Toyon	-2.00000	0.00000	0.00000
Chinese Elm	-1.000000	0.00000	0.00000
Shamel Ash	-1.000000	0.00000	0.00000

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	—	annual days of extreme heat
Extreme Precipitation	—	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	—	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	71.6615
AQ-PM	59.1661
AQ-DPM	88.5128
Drinking Water	87.2237
Lead Risk Housing	73.0183
Pesticides	0.00000
Toxic Releases	69.1423
Traffic	69.3625
Effect Indicators	—
CleanUp Sites	54.2553
Groundwater	14.9261
Haz Waste Facilities/Generators	38.7028
Impaired Water Bodies	33.1583
Solid Waste	52.8981
Sensitive Population	—
Asthma	9.69591

Cardio-vascular	6.54287
Low Birth Weights	24.3136
Socioeconomic Factor Indicators	—
Education	16.2111
Housing	56.4766
Linguistic	46.0008
Poverty	29.2085
Unemployment	51.2624

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	68.77967407
Employed	91.37687668
Median HI	58.24457847
Education	—
Bachelor's or higher	85.38431926
High school enrollment	100
Preschool enrollment	59.16848454
Transportation	—
Auto Access	53.75336841
Active commuting	70.76863852
Social	—
2-parent households	61.91453869
Voting	76.97934043
Neighborhood	—
Alcohol availability	46.27229565

Park access	50.48120108
Retail density	80.73912486
Supermarket access	80.11035545
Tree canopy	90.63261902
Housing	—
Homeownership	17.51571924
Housing habitability	44.87360452
Low-inc homeowner severe housing cost burden	83.60066727
Low-inc renter severe housing cost burden	79.18644938
Uncrowded housing	58.74502759
Health Outcomes	—
Insured adults	52.90645451
Arthritis	0.0
Asthma ER Admissions	98.1
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	41.7
Cognitively Disabled	74.6
Physically Disabled	54.0
Heart Attack ER Admissions	95.3
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	40.5

Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	19.9
Elderly	61.3
English Speaking	74.0
Foreign-born	48.3
Outdoor Workers	58.4
Climate Change Adaptive Capacity	—
Impervious Surface Cover	59.6
Traffic Density	60.6
Traffic Access	56.5
Other Indices	—
Hardship	18.2
Other Decision Support	—
2016 Voting	65.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	35.0000
Healthy Places Index Score for Project Location (b)	77.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Appendix B-2

i-Tree Output

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: Los Angeles, CA 90004
Total number of trees planted in this project: 48
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vis	TreeCondit	CrownLigh	DBH (inche	Height (fee	Surviving Tr	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity S	Electricity S	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
4	6 California	6	California s	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	57.4	2.5	3.8	2,291.00	17,875.00	1.5	0	$0.00	7,577.60	$447.14	0	$0.00	0	$0.00	46,902.90	46,899.70	########	14,264.00	$127.46	57.01	0	13.14	0	0.91	0	0	0.53	$0.00	$341.30
5	10 Coastal	10	Coastal live	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	67	4.1	6.4	4,157.40	33,867.40	5.6	0	$0.00	29,150.80	########	0	$0.00	0	$0.00	84,250.10	84,244.30	########	25,621.90	$228.96	107.34	0	26.64	0	1.89	0	0	1.14	$0.00	$688.87
7	16 Europea	16	European b	2.3	>60	north (0Â°)	post-1980	excellent	full sun	15.5	17.3	6.6	8.7	1,931.90	7,947.70	4	0	$0.00	21,477.10	########	0	$0.00	0	$0.00	46,918.70	46,915.50	########	14,268.80	$127.51	45.23	0	9.82	0	0.74	0	0	0.27	$0.00	$246.66
11	12 Toyon(H	12	Toyon(Hete	2.3	>60	north (0Â°)	post-1980	excellent	full sun	17.6	53.4	5	8.4	4,664.20	23,822.80	10.9	0	$0.00	61,048.90	########	0	$0.00	0	$0.00	########	########	########	34,906.60	$311.93	129	0	30.97	0	2.3	0	0	1.08	$0.00	$775.68
12	4 California	4	California r	2.3	>60	north (0Â°)	post-1980	excellent	full sun	18.3	63.3	1.7	3	1,844.50	8,074.70	1.9	0	$0.00	11,551.80	$681.65	0	$0.00	0	$0.00	51,109.70	51,106.10	########	15,543.30	$138.90	54.49	0	12.13	0	0.88	0	0	0.39	$0.00	$307.61

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	78.73025	182.2085	311.3389	466.6434	648.3442	856.4221	1090.66	1350.676	1635.958	1945.881	2279.739	2631.786	2997.862	3376.946	3755.894	4120.429	4469.703	4803.625	5122.624	5427.467	5716.215	5988.167	6244.517	6486.505	6715.609	6935.109	7144.148	7343.783	7534.988	7718.655
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	10.67608	23.4221	38.22621	55.06647	73.9102	94.7147	117.4284	141.9922	168.3404	196.4021	226.1024	257.3629	290.0639	324.0702	359.257	395.4642	432.5036	470.2102	508.4393	547.0647	585.976	625.0675	664.241	703.4106	742.5012	781.4473	820.1916	858.6845	896.8824	934.7478
Air Pollutio	17.04412	38.523075	64.80647	96.23165	133.0873	175.6014	223.93219	278.1625	338.2975	404.2646	475.9172	553.03993	635.2641	722.15468	813.28174	908.0894	1005.9343	1106.244	1208.508	1312.273	1417.133	1522.667	1628.505	1734.32	1839.817	1944.778	2049.447	2153.6589	2257.261	2360.1172845638002
Combined	106.4505	244.15366	414.3716	617.9415	855.3417	1126.738	1432.02	1770.831	2142.595	2546.5479	2981.7583	3442.188	3923.1895	4423.1713	4928.433	5423.983	5908.141	6380.079	6839.571	7286.8046	7719.323	8135.9014	8537.263	8924.236	9297.928	9661.3335	10013.787	10356.13	10689.131	11013.52

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: Los Angeles, CA 90004
Total number of trees planted in this project: 11
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vis	TreeCondit	CrownLigh	DBH (inche	Height (fee	Surviving Tr	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity S	Electricity S	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
1	2 Coastal li	2	Coastal live	19.85	>60	north (0Â°)	post-1980	excellent	full sun	34.4	84.1	0.83	5.3	1,840.30	13,050.70	6.5	0	$0.00	27,086.70	########	0	$0.00	0	$0.00	61,691.60	61,687.30	########	18,761.50	$167.65	83.47	0	21.02	0	1.46	0	0	0.98	$0.00	$551.58
2	1 European	1	European b	14.2	>60	north (0Â°)	post-1980	good	full sun	18.2	17.9	0.41	0.75	146.1	612.4	0.4	0	$0.00	1,008.60	$59.52	0	$0.00	0	$0.00	5,593.20	5,592.80	28,288.60	1,701.00	$15.20	6.09	0	1.35	0	0.1	0	0	0.04	$0.00	$33.96
4	1 European	1	European b	14.2	>60	north (0Â°)	post-1980	good	full sun	18.2	17.9	0.41	0.75	146.1	612.4	0.4	0	$0.00	1,008.60	$59.52	0	$0.00	0	$0.00	5,593.20	5,592.80	28,288.60	1,701.00	$15.20	6.09	0	1.35	0	0.1	0	0	0.04	$0.00	$33.96
5	1 European	1	European b	14.2	>60	north (0Â°)	post-1980	good	full sun	18.2	17.9	0.41	0.75	146.1	612.4	0.4	0	$0.00	1,008.60	$59.52	0	$0.00	0	$0.00	5,593.20	5,592.80	28,288.60	1,701.00	$15.20	6.09	0	1.35	0	0.1	0	0	0.04	$0.00	$33.96
6	1 European	1	European b	14.2	>60	north (0Â°)	post-1980	good	full sun	18.2	17.9	0.41	0.75	146.1	612.4	0.4	0	$0.00	1,008.60	$59.52	0	$0.00	0	$0.00	5,593.20	5,592.80	28,288.60	1,701.00	$15.20	6.09	0	1.35	0	0.1	0	0	0.04	$0.00	$33.96
7	5 Mexican f	5	Mexican fa	17	>60	north (0Â°)	post-1980	good	full sun	41.9	42.2	2.1	19.8	5,059.20	11,688.40	2	0	$0.00	9,495.30	$560.30	0	$0.00	0	$0.00	########	########	########	36,881.80	$329.58	115.87	0	26.29	0	2.11	0	0	0.64	$0.00	$638.01

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	90.04931	179.3646	267.9441	355.7917	442.9151	529.3244	615.0309	700.0464	784.3829	868.0522	951.0658	1033.435	1115.169	1196.28	1276.776	1356.667	1435.962	1510.861	1589.976	1668.637	1746.843	1824.59	1901.244	1976.418	2050.102	2122.284	2193.006	2262.307	2330.202	2396.709
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	16.42535	33.18251	50.24953	67.60473	85.22674	103.0946	121.1876	139.4856	157.9689	176.6181	195.4144	214.3395	233.3755	252.5052	271.7117	290.9787	310.2905	329.6319	348.9882	368.3452	387.6893	407.0073	426.2867	445.5034	464.628	483.634	502.4973	521.1965	539.7125	558.0281
Air Pollutio	40.6451	82.17701	124.5354	167.6565	211.4727	255.9137	300.9063	346.3744	392.2406	438.4255	484.8489	531.4302	578.0887	624.7442	671.3178	717.7320	763.9116	809.7835	854.0773	898.2706	942.3299	986.223	1029.918	1073.363	1116.489	1159.237	1201.547	1243.372	1284.675	1325.423
Combined	147.1198	294.7249	442.729	591.0529	739.6146	888.3328	1037.125	1185.906	1334.592	1483.096	1631.329	1779.205	1926.634	2073.53	2219.806	2365.378	2510.164	2650.277	2793.041	2935.253	3076.862	3217.821	3357.45	3495.284	3631.219	3765.155	3897.051	4026.876	4154.589	4280.16

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: Pasadena, CA 91103
Total number of trees planted in this project: 61
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group	Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vio	TreeCondit	CrownLigh	DBH (inche	Height (fee	Surviving Ti	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity S	Electricity S	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
4	9	Californi	9	California s	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	57.4	3.7	5.7	3,436.50	26,812.50	2.2	0	$0.00	11,366.40	$670.71	0	$0.00	0	$0.00	69,005.00	69,002.70	########	23,597.70	$210.87	85.52	0	19.71	0	1.37	0	0	0.79	$0.00	$511.95
5	26	Coastal	26	Coastal live	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	67	11	16.6	10,809.20	88,055.20	14.6	0	$0.00	75,792.10	########	0	$0.00	0	$0.00	########	########	########	73,472.20	$656.55	279.08	0	69.25	0	4.91	0	0	2.98	$0.00	########
6	17	Black wi	17	Black willo	2.3	>60	north (0Â°)	post-1980	excellent	full sun	29.4	69.2	7	33.2	15,089.30	54,234.10	22.8	0	$0.00	########	########	0	$0.00	0	$0.00	########	########	########	86,490.70	$772.88	287.71	0	64.81	0	4.65	0	0	2.24	$0.00	########
7	9	Europear	9	European b	2.3	>60	north (0Â°)	post-1980	excellent	full sun	15.5	17.3	3.7	4.9	1,086.70	4,470.60	2.3	0	$0.00	12,080.90	$712.87	0	$0.00	0	$0.00	25,885.60	25,884.70	########	8,852.10	$79.10	25.44	0	5.52	0	0.42	0	0	0.15	$0.00	$138.74

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	77.56524	180.9205	311.3359	469.635	656.2845	871.4569	1115.079	1386.871	1686.381	2013.009	2366.042	2744.669	3148.009	3575.126	4025.049	4496.785	4989.333	5501.695	6032.885	6581.934	7146.258	7723.936	8314.119	8916.021	9529.519	10159.31	10799.52	11449.46	12108.47	12775.89
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	16.78869	36.86089	60.23915	86.92939	116.9212	150.1889	186.693	226.3816	269.1919	315.0519	363.8809	415.5918	470.0912	527.2811	587.0593	649.3206	713.9574	780.8603	849.9188	921.0218	994.0581	1068.911	1145.461	1223.592	1303.189	1384.141	1466.341	1549.685	1634.072	1719.401
Air Pollutio	25.63211	58.35821	98.865143	147.7904	205.6938	273.0328	350.14318	437.223	534.3219	641.33665	758.01171	883.94600	1018.605	1161.335	1311.3870	1467.933	1630.0927	1796.9536	1969.291	2147.2177	2330.205	2517.6892	2709.11	2903.919	3101.5801	3300.313	3499.5775	3698.9324	3897.963	4096.282
Combined	119.986	276.1396	470.4402	704.35485	978.89944	1294.679	1651.915	2050.476	2489.894	2969.397	3487.934	4044.207	4636.705	5263.743	5923.495	6614.039	7333.3830	8079.5088	8852.095	9650.173	10470.521	11310.54	12168.69	13043.532	13934.29	14843.76	15765.435	16698.076	17640.501	18591.58

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: Pasadena, CA 91103
Total number of trees planted in this project: 6
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vis	TreeCondit	CrownLigh	DBH (inche	Height (fee	Surviving Tr	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity S	Electricity S	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
1	1 European	1	European b	7.67	>60	north (0Â°)	post-1980	fair	full sun	16.6	17.6	0.41	0.62	130.9	454.8	0.3	0	$0.00	1,440.00	$84.97	0	$0.00	0	$0.00	3,392.40	3,392.20	17,794.10	1,160.10	$10.37	4	0	0.86	0	0.07	0	0	0.02	$0.00	$21.63
2	1 European	1	European b	7.65	>60	north (0Â°)	post-1980	fair	full sun	16.6	17.6	0.41	0.62	130.8	454.5	0.3	0	$0.00	1,439.60	$84.95	0	$0.00	0	$0.00	3,387.70	3,387.60	17,769.60	1,158.50	$10.35	3.99	0	0.86	0	0.07	0	0	0.02	$0.00	$21.60
3	1 European	1	European b	21.1	>60	north (0Â°)	post-1980	fair	full sun	21.4	18.6	0.41	1	178.9	696.1	0.5	0	$0.00	84.1	$4.96	0	$0.00	0	$0.00	6,443.20	6,442.90	33,796.50	2,203.40	$19.69	8.19	0	1.8	0	0.13	0	0	0.05	$0.00	$45.47
4	1 European	1	European b	15.1	>60	north (0Â°)	post-1980	fair	full sun	18.2	17.9	0.41	0.74	145.7	526.4	0.4	0	$0.00	786.8	$46.43	0	$0.00	0	$0.00	4,829.50	4,829.40	25,332.60	1,651.60	$14.76	5.94	0	1.3	0	0.1	0	0	0.04	$0.00	$32.59
5	1 European	1	European b	10.5	>60	north (0Â°)	post-1980	fair	full sun	17.4	17.7	0.41	0.68	138	488.9	0.3	0	$0.00	1,377.20	$81.27	0	$0.00	0	$0.00	4,010.10	4,010.00	21,034.40	1,371.30	$12.25	4.83	0	1.05	0	0.08	0	0	0.03	$0.00	$26.31
6	1 European	1	European b	10.47	>60	north (0Â°)	post-1980	fair	full sun	17.4	17.7	0.41	0.68	138	488.6	0.3	0	$0.00	1,379.10	$81.38	0	$0.00	0	$0.00	4,004.20	4,004.00	21,003.20	1,369.30	$12.24	4.82	0	1.05	0	0.08	0	0	0.03	$0.00	$26.27
																			6,506.80												6.92		0.53			0.19		

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	20.29385	40.65503	61.07325	81.53882	101.8495	121.5636	140.6823	159.2129	177.1677	194.5629	211.4173	227.5352	242.6483	256.7877	269.9894	282.2934	293.7417	304.3781	314.2467	323.3917	331.8566	339.6839	346.915	353.5895	359.7455	365.4192	370.6451	375.4556	379.8814	383.9513
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	3.152271	6.28612	9.400149	12.49308	15.56375	18.61049	21.63056	24.62148	27.58107	30.50739	33.39871	36.25354	39.06994	41.84537	44.57764	47.26485	49.90541	52.49798	55.04147	57.535	59.97791	62.36973	64.71015	66.99902	69.23632	71.42218	73.55682	75.64057	77.67385	79.65715
Air Pollutio	6.6354898	13.2564	19.86002	26.44382	33.00545	39.53945	46.03543	52.48767	58.89092	65.24045	71.532	77.76176	83.92274	90.00583	96.005358	101.9163	107.73444	113.4559	119.0775	124.5965	130.0109	135.3188	140.5189	145.61033	150.5924	155.4649	160.2278	164.8814	169.4262	173.8628
Combined	30.081615	60.19754	90.333412	120.4757	150.41866	179.7135	208.3483	236.322	263.6397	290.3107	316.34796	341.5505	365.641	388.63885	410.5724	431.47456	451.38158	470.332	488.3657	505.52325	521.8454	537.3725	552.1441	566.1988	579.57423	592.3063	604.4297	615.97756	626.9814	637.4712

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: South Pasadena, CA 91030
Total number of trees planted in this project: 107
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vis	TreeCondit	CrownLigh	DBH (inche	Height (fee	Surviving Tr	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity S	Electricity S	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
4	11 Californ	11	California s	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	57.4	4.5	7	4,200.20	32,770.80	2.7	0	$0.00	13,892.30	$819.76	0	$0.00	0	$0.00	82,912.20	82,912.00	########	31,170.40	$278.54	104.52	0	24.09	0	1.67	0	0	0.97	$0.00	$625.72
5	14 Coastal	14	Coastal live	2.3	>60	north (0Â°)	post-1980	excellent	full sun	16.8	67	5.8	8.9	5,820.30	47,414.30	7.9	0	$0.00	40,811.10	########	0	$0.00	0	$0.00	########	########	########	42,756.30	$382.07	150.27	0	37.29	0	2.65	0	0	1.6	$0.00	$964.41
6	72 Black wi	72	Black willo	2.3	>60	north (0Â°)	post-1980	excellent	full sun	29.4	69.2	30	140.7	63,907.50	########	96.8	0	$0.00	########	########	0	$0.00	0	$0.00	########	########	########	########	########	1,218.53	0	274.49	0	19.69	0	0	9.49	$0.00	########
7	10 Europea	10	European b	2.3	>60	north (0Â°)	post-1980	excellent	full sun	15.5	17.3	4.1	5.4	1,207.40	4,967.30	2.5	0	$0.00	13,423.20	$792.08	0	$0.00	0	$0.00	28,275.00	28,275.00	########	10,629.90	$94.99	28.27	0	6.13	0	0.46	0	0	0.17	$0.00	$154.16

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	153.3209	372.4729	661.7167	1023.954	1461.035	1973.965	2563.064	3228.084	3968.306	4782.624	5669.611	6627.577	7654.62	8748.67	9907.525	11128.89	12410.38	13749.59	15144.08	16591.39	18087.25	19628.12	21211.64	22835.51	24497.85	26199.4	27935.25	29703.31	31501.56	33328.03
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	33.2286	74.42599	123.8193	181.5681	247.7724	322.4797	405.6907	497.3656	597.4283	705.7715	822.2604	946.7362	1079.02	1218.913	1366.204	1520.668	1682.068	1850.16	2024.692	2205.406	2392.04	2584.322	2781.977	2984.727	3192.298	3404.419	3620.833	3841.283	4065.515	4293.277
Air Pollutio	44.51925	104.6273	182.277	279.2673	397.15667	537.1887	700.2292	886.7179	1096.638	1329.5045	1584.373	1859.8695	2154.233	2465.38	2790.97	3128.49	3475.322	3828.827	4193.602	4571.496	4961.697	5363.3503	5775.6079	6197.632	6628.594	7061.878	7491.858	7917.4635	8337.714	8751.721
Combined	231.0687	551.5262	967.813	1484.789	2105.964	2833.6333	3668.9838	4612.167	5662.372	6817.9	8076.245	9434.183	10887.87	12432.96	14064.7	15778.04	17567.771	19428.58	21362.375	23368.29	25440.987	27575.793	29769.222	32017.872	34318.75	36665.7	39047.94	41462.052	43904.79	46373.03

i-Tree Planting
Report is an i-TreeÂ® benefits and tree growth forecast.

Location: South Pasadena, CA 91030
Total number of trees planted in this project: 119
Electricity Emissions Factor: 2524
Fuel Emissions Factor: 52
Project years: 30
Annual Tree Mortality: 3
Run Date: 2-10-2026
Run Version: 2.8.1

Group	Iden	Tree Group	Initial Num	Species	Initial DBH	Distance to	Direction	Building Vis	TreeCondit	CrownLight	DBH (inche	Height (fee	Surviving Tr	Basal Area	Canopy Co	Leaf Area (r	Biomass (s	CO2 Avoide	CO2 Avoide	CO2 Seque	CO2 Seque	Electricity	Electricity	Fuel Saved	Fuel Saved	Rainfall Int	Evaporatio	Transpirati	Avoided Ru	Avoided Ru	O3 Remove	NO2 Avoide	NO2 Remo	SO2 Avoide	SO2 Remo	VOC Avoide	PM2.5 Avoi	PM2.5 Rem	Avoided Va	Removal Value ($)
13	2	Carob(Ce	2	Carob(Cer	16.55	>60	north (0Â°	post-1980	good	full sun	18.7	64	0.83	1.6	863.3	4,162.00	0.9	0	$0.00	1,593.60	$94.03	0	$0.00	0	$0.00	34,276.00	34,275.90	########	12,885.90	$115.15	42.86	0	10.33	0	0.76	0	0	0.37	$0.00	$259.14
14	4	Europear	4	European b	14.2	>60	north (0Â°	post-1980	good	full sun	18.2	17.9	1.7	3	584.5	2,449.50	1.4	0	$0.00	4,034.50	$238.07	0	$0.00	0	$0.00	21,572.20	21,572.20	########	8,110.00	$72.47	24.37	0	5.38	0	0.4	0	0	0.16	$0.00	$135.83
15	12	Black wi	12	Black willo	14.6	>60	north (0Â°	post-1980	good	full sun	40	81.9	5	43.3	16,902.80	17,277.30	34.6	0	$0.00	########	########	0	$0.00	0	$0.00	########	########	########	########	########	385.34	0	83.79	0	6.32	0	0	2.39	$0.00	########
16	6	Californi	6	California s	44.7	>60	north (0Â°	post-1980	good	full sun	50.5	103	2.5	34.4	8,693.80	82,211.20	21.2	0	$0.00	31,663.30	########	0	$0.00	0	$0.00	########	########	########	########	########	501.95	0	119.14	0	7.94	0	0	5.74	$0.00	########
17	5	Brazilian	5	Brazilian pe	39.6	>60	north (0Â°	post-1980	good	full sun	40.2	74.4	2.1	18.2	4,709.20	19,543.10	18.1	0	$0.00	3,472.70	$204.92	0	$0.00	0	$0.00	########	########	########	72,611.90	$648.86	228.28	0	54.23	0	4.09	0	0	1.76	$0.00	########
18	77	Mexican fa	77	Mexican fa	17	>60	north (0Â°	post-1980	good	full sun	41.9	42.2	32	304.4	77,911.30	########	30.3	0	$0.00	########	########	0	$0.00	0	$0.00	########	########	########	########	########	1,784.39	0	404.87	0	32.51	0	0	9.89	$0.00	########
19	2	Toyon(He	2	Toyon(Hete	15.85	>60	north (0Â°	post-1980	good	full sun	18.6	54.7	0.83	1.6	831.4	3,911.10	2.1	0	$0.00	4,696.50	$277.13	0	$0.00	0	$0.00	32,325.80	32,325.70	########	12,152.70	$108.60	40.15	0	9.66	0	0.72	0	0	0.34	$0.00	$241.91
20	1	Chinese e	1	Chinese elr	37.9	>60	north (0Â°	post-1980	good	full sun	51.3	108.5	0.41	5.9	1,290.70	983.7	7.1	0	$0.00	21,180.80	########	0	$0.00	0	$0.00	47,611.90	47,611.80	########	17,899.50	$159.95	34.32	0	6.86	0	0.58	0	0	0.11	$0.00	$172.28
21	1	Shamel a	1	Shamel ash	15.9	>60	north (0Â°	post-1980	good	full sun	34	98.7	0.41	2.6	789.8	2,091.60	1.8	0	$0.00	8,829.50	$521.02	0	$0.00	0	$0.00	26,343.90	26,343.80	########	9,903.90	$88.50	28.4	0	6.2	0	0.47	0	0	0.18	$0.00	$156.07
22	9	Coastal li	9	Coastal live	19.85	>60	north (0Â°	post-1980	excellent	full sun	34.4	84.1	3.7	24	8,281.40	58,728.10	29.2	0	$0.00	########	########	0	$0.00	0	$0.00	########	########	########	########	$899.25	375.62	0	94.57	0	6.58	0	0	4.41	$0.00	########

Cumulative graph data

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sequestere	1008.488	2023.927	3045.916	4074.037	5107.855	6146.922	7190.778	8238.956	9290.986	10346.4	11402.89	12459.99	13517.35	14574.64	15631.51	16687.67	17742.86	18738.21	19805.97	20844.75	21885.41	22927.52	23960.95	24979.42	25982.45	26952.81	27889.3	28792.16	29661.71	30498.48
Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Avoided Ru	309.0566	623.675	943.5773	1268.479	1598.091	1932.119	2270.268	2612.24	2957.738	3306.463	3658.121	4012.401	4369.007	4727.652	5088.056	5449.941	5813.037	6177.077	6541.803	6906.961	7272.304	7637.591	8002.589	8366.851	8729.833	9091.037	9449.939	9806.059	10158.96	10508.27
Air Pollutio	636.6227	1283.176	1938.714	2602.2041	3272.6062	3950.293	4635.189	5326.404	6022.997	6723.982	7428.3417	8135.0272	8842.806	9548.313	10250.43	10948.01	11639.98	12325.31	12984.56	13640.609	14293.07	14941.57	15585.76	16224.93	16858.21	17484.8	18103.99	18715.17	19317.84	19911.56
Combined	1954.167	3930.779	5928.2072	7944.7200	9978.552	12029.33	14096.24	16177.6	18271.72	20376.85	22489.36	24607.413	26729.17	28850.6	30969.99	33085.63	35195.87	37240.59	39332.33	41392.32	43450.78	45506.68	47549.3	49571.2	51570.5	53528.65	55443.231	57313.39	59138.51	60918.31

Appendix C

Biological Resources Assessment Report

February 11, 2026

Christina Monde, P.E.
Project Manager
City of Pasadena Department of Public Works
100 North Garfield Avenue, Room N306
Pasadena, California 91109

VIA EMAIL
cmonde@cityofpasadena.net

Subject: Updated Biological Resources Assessment Report for the Arroyo Seco Water Reuse Project, cities of Pasadena, South Pasadena, and Los Angeles, California

Dear Ms. Monde:

This Biological Resources Assessment Report (BRA) presents the findings of an updated biological resources assessment for the Arroyo Seco Water Reuse Project (hereinafter referred to as the "Project") located in the cities of Pasadena, South Pasadena, and Los Angeles in Los Angeles County, California (Exhibit 1, Regional Location and Local Vicinity). This report updates the findings of the biological resources assessment prepared for the Project and dated November 2023. The purpose of the biological assessment is to revise or verify previously documented biological resources, evaluate potential biological constraints on the Project, identify potential impacts to biological resources and jurisdictional waters resources that could result from implementation of the Project, and recommend protective measures to ensure avoidance of impacts or to reduce impacts to a level of less than significant.

PROJECT DESCRIPTION AND LOCATION

The proposed Project involves the diversion of stormwater runoff from San Rafael Creek into treatment wetlands that would be created in an approximate 1.4-acre adjacent upland area (San Rafael site). These treatment wetlands would improve water quality and allow for soil infiltration before discharging treated water into the Arroyo Seco Channel. Further downstream, water would be diverted from the Arroyo Seco via existing facilities to restored treatment wetlands within the approximate 2.2-acre San Pascual site. A proposed off-site water harvester and related infrastructure would be installed within the existing, gated, approximately 1,375-square-foot maintenance yard at the Arroyo Seco Golf Course (Golf Course) in South Pasadena.

The Arroyo Seco Water Reuse Project survey area is generally centered along a portion of the Arroyo Seco Channel that begins just south of the San Rafael Avenue bridge overpass of the Arroyo Seco Channel in the City of Pasadena and extends approximately ½-mile south (downstream) to immediately north of the State Route 110 overpass in the City of South Pasadena. The survey area referenced herein includes the following: (1) the San Rafael area at the northern end of the survey area, which consists of vacant open space lands and a concrete-lined drain that conveys

water into the Arroyo Seco Channel from adjacent residential areas that are located northwest of the survey area; (2) the Arroyo Seco Channel, which consists of the concrete-lined channel extending between the Project site along with an adjacent dirt trail that runs along the eastern bank adjacent to the San Pascual Stables; and (3) the San Pascual area, a man-made treatment wetland that is currently densely vegetated and accepts flows diverted from the Arroyo Seco Channel through existing infrastructure in the northern portion of the site. The San Pascual site is located between Arroyo Park, located across Stoney Drive immediately to the east; and San Pascual Park, located across the Arroyo Seco Channel immediately to the west. The Golf Course maintenance yard was not included in the survey area because it is in a heavily disturbed condition and no special status biological resources are present within the fenced area. The survey area captures all jurisdictional waters and biological resources that may be directly and indirectly affected by Project implementation.

Within the survey area, the Project area assessed for impacts to biological resources encompasses the two discrete Project sites, construction staging areas, and adjacent buffer areas. The San Rafael site is situated southwest of the San Rafael Avenue overpass of the Arroyo Seco Channel and adjacent to Pasadena's southern boundary. In addition to the property within Pasadena, the San Rafael site includes a linear feature that is within the limits of the San Rafael Creek easement under Los Angeles County Flood Control District jurisdiction. The San Pascual site is situated southeast of the San Pascual Avenue overpass of the Arroyo Seco Channel and includes land within the City of South Pasadena (1.7-acres) and the City of Los Angeles (0.5-acre). The survey area is located on the U.S. Geological Survey's (USGS') Pasadena and Los Angeles 7.5-minute quadrangles of the San Bernardino Meridian at Township 1 North, Range 12 West, Section 32 and Township 1 South, Range 12 West, Section 5 (Exhibit 2, USGS Quadrangle Topographic Map; Exhibit 3, Survey Area).

METHODS

A literature review and field studies were conducted to document the biological resources as well as jurisdictional drainage features on and adjacent to the sites using the methods described below. An additional temporary staging area, the parking lot located on the southeast corner of the intersection of San Pascual Avenue and Stoney Drive at Arroyo Park, was included in all field surveys at the San Pascual site.

Literature Review

Prior to the survey, a literature review was conducted to identify special status plants, wildlife, and habitats that have been reported to occur in the vicinity of the survey area. The California Native Plant Society's (CNPS') Inventory of Rare and Endangered Plants (CNPS 2025) and the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CDFW 2025a) were reviewed. Database searches included the USGS' Burbank, Hollywood, El Monte, Mt. Wilson, Pasadena, and Los Angeles 7.5-minute quadrangles. Resources reviewed to assist in the delineation of jurisdictional features included the U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA NRCS') Web Soil Survey, the USDA NRCS' Hydric Soils List (USDA NRCS 2023), and the U.S. Fish and Wildlife Service's (USFWS') National Wetlands Inventory Wetland Mapper (USFWS 2023).

Vegetation Mapping and General Survey

Psomas Senior Biologist Sarah Thomas conducted a general plant and wildlife survey and verified vegetation within the Project's survey area on June 16, 2023. An additional field visit was conducted May 1, 2025, to revise or verify previously documented existing conditions. Vegetation was mapped on a 1-inch equals 100-foot (1″=100′) scale color aerial. Nomenclature for vegetation types generally follows that of *A Manual of California Vegetation* (Sawyer et. al. 2009) when feasible. All plant species observed were recorded in field notes. Plants were identified using taxonomic keys, descriptions, and illustrations in Jepson Flora Project (2025), Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2025c) for special status species and the Jepson eFlora (Jepson Flora Project 2025) for all other taxa.

All wildlife species detected during the survey were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic signs, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows the *Special Animals List* (CDFW 2025b) for special status species; for other species, Center for North American Herpetology (2015) for amphibians and reptiles, the American Ornithological Society (2024) for birds, and the Smithsonian National Museum of Natural History (2011) for mammals.

Focused Special Status Plant Survey

A focused special status plant survey was conducted in 2022, and the results were reviewed and updated as appropriate in 2025 as part of this updated BRA. Botanical surveys were floristic in nature and consistent with the protocols created by the CDFW (CDFW 2018). Prior to the special status plant field surveys conducted by Psomas Biologist Sarah Thomas on June 16, 2022, and May 1, 2025, a literature search was conducted to identify special status plant species reported from the vicinity of the Project sites. Sources reviewed included the USGS Pasadena, Burbank, Hollywood, Los Angeles, El Monte, and Mt. Wilson 7.5-minute quadrangles in the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (CNPS 2025) and the CDFW's California Natural Diversity Database (CDFW 2025a). Rainfall received in the winter and spring determines the germination of many annual and perennial herb species. The region received approximately 9.96 inches of precipitation between July 2021 and June 2022 (data taken from Burbank Station) (CIMIS 2023). The average annual precipitation for this area is approximately 13.91 inches.

Reference populations were monitored for annual and difficult-to-detect target species to ensure that the surveys were comprehensive. This is especially relevant during periods of unusual rainfall patterns or below average rainfall. If conditions at a nearby reference population are suitable for germination and growth, then it can be inferred that conditions would also be suitable on the Project sites. Reference populations were not monitored for species with a California Rare Plant Rank (CRPR) of 3 or 4, large perennials which would be identifiable throughout the year, or for species lacking a publicly accessible reference population.

The plant survey area included the entire boundary of the Project sites. The potentially suitable habitats for special status plants on the Project sites were systematically surveyed to the extent possible during the site visit. All plant species observed were recorded in field notes. Plants were identified using taxonomic keys, descriptions, and illustrations in Jepson Flora Project (2025), Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2025c) for special status species and the Jepson eFlora (Jepson Flora Project 2025) for all other taxa. An additional field visit was conducted May 1, 2025, to confirm whether conditions and potential for plants species to occur remained the same as previously documented and the 2023 plant survey remained valid.

Any special status plant species observed on the Project sites would be mapped using a Garmin handheld Global Positioning System unit and data would be collected on the number and phenology of individuals (estimated for large populations) and microsite characteristics (e.g., slope, aspect, soil texture, surrounding habitat, and associated species). Detailed methods and results can be found in the *Focused Special Status Plant Survey Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project* (Special Status Plant Report, Psomas 2025), provided as Appendix B.

Jurisdictional Delineation

Section 404 of the federal Clean Water Act (CWA) and Section 1602 of the *California Fish and Game Code* regulate activities affecting resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and the CDFW, respectively. Waters of the United States (WOTUS) under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes. Section 401 of the CWA provides the Regional Water Quality Control Board (RWQCB) with the authority to regulate, through a Water Quality Certification, any proposed federally permitted activity that may affect water quality. The RWQCB also has jurisdiction over isolated wetlands and waters of the State under the Porter-Cologne Water Quality Control Act.

A delineation of jurisdictional water resource boundaries was conducted by Psomas Senior Regulatory Specialist David Hughes and Biologist Trevor Bristle on February 10, 2022, to describe the type and extent of waters regulated by the USACE, the RWQCB, and/or the CDFW within the survey area. Jurisdictional features were mapped on an aerial. Non-wetland waters of the United States under the jurisdiction of the USACE were assessed based on the presence of an Ordinary High Water Mark (OHWM). The presence of wetland waters of the United States was assessed using a three-parameter approach for wetland hydrology, hydrophytic vegetation, and hydric soils, as described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). It should be noted that the RWQCB shares USACE jurisdiction unless isolated conditions are present. If conditions indicating isolated waters are present, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the three-parameter wetlands methods. The CDFW's jurisdiction is generally defined as the top of the bank of a river, stream, or lake or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, or lake. Detailed methods and results can be found in the *Jurisdictional Delineation for the Arroyo Seco Water Reuse and Natural Stream*

Restoration Project (Jurisdictional Delineation Report, Psomas 2023), provided as Appendix A. It is noted that the assessment of jurisdictional waters herein is based on the Jurisdictional Delineation Report prepared for the Project and dated November 2023, as there has been no material change to the extent of jurisdictional resources in the Project area.

Tree Survey

A tree survey was conducted by Psomas Certified Arborists David Hughes (International Society of Arboriculture [ISA] Certificate WE-7752A) and Trevor Bristle (ISA Certificate WE-10233A) on February 3, 2022, and September 9, 2022, to document tree resources within the Project survey area. An updated tree survey was conducted on October 20 and 22, 2025, to identify any trees that had died since the initial survey and other trees that may have grown to meet the minimum size for regulated trees. Specifically, the objective of the tree surveys was to identify and quantify trees regulated by the cities of Pasadena, South Pasadena, Los Angeles, and/or the California Fish and Game Code, and to assess impacts resulting from Project implementation. Detailed methods and results can be found in the *Tree Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project* (Tree Report, Psomas 2026), provided as Appendix C.

SURVEY RESULTS

Vegetation Types and Other Landcovers

The survey area consists of disturbed coast live oak woodland, coast live oak-western sycamore woodland, Peruvian pepper tree – coast live oak woodland, non-native ornamental woodland, disturbed blue elderberry – laurel sumac scrub, non-native grassland, bare ground, disturbed, and developed (Exhibit 4, Vegetation Types and Other Areas) areas. These areas are each described below.

Compared to the 2023 general vegetation survey, in Spring 2025 some of the vegetation on the San Pascual site shows evidence of recent fires and/or physical disturbance from unauthorized bicycle motorcross course establishment and/or unhoused encampment development and use. The vegetation types and other landcovers in the remainder of the survey area – the San Rafael site and Arroyo Seco Channel – are essentially the same as surveyed in 2023.

Disturbed Coast Live Oak Woodland

Disturbed coast live oak woodland occurs directly adjacent to trails, channels, and within generally disturbed areas within and near the San Rafael site and within the Arroyo Seco Channel. This vegetation type consists of coast live oak (*Quercus agrifolia*) as the dominant tree, with a mostly closed overstory. Other tree species also occurring include blue elderberry (*Sambucus nigra* ssp. *caerulea*). Understory species include but are not limited to western poison oak (*Toxicodendron diversilobum*), hollyleaf redberry (*Rhamnus ilicifolia*), toyon (*Heteromeles arbutifolia*), dwarf nettle (*Urtica urens*), and foxtail chess (*Bromus madritensis*). This vegetation type corresponds to the *Quercus agrifolia* Woodland Alliance in Sawyer et. al. (2009). It is not considered a sensitive natural community by the CDFW.

Coast Live Oak – Western Sycamore Woodland

Coast live oak – western sycamore woodland occurs on the south end of the Project, along the edges of the San Pascual site. This vegetation type consists mostly of areas with mature coast live oaks and Western sycamore (*Platanus racemosa*) trees with a closed canopy. Other tree species also occurring include blue elderberry, black willow (*Salix gooddingii*), toyon (*Heteromeles arbutifolia*), and shamel ash (*Fraxinus uhdei*). The understory is relatively sparse with species such as but not limited to mule fat (*Baccharis salicifolia* ssp. *salicifolia*), sisymbrium (*Sisymbrium* sp.), bitter gooseberry, common horehound (*Marrubium vulgare*), toyon, and brome. This vegetation type corresponds to the *Platanus racemosa - Quercus agrifolia* Alliance in Sawyer et. al. (2009). It is considered a sensitive natural community by the CDFW. This area has been heavily degraded by adverse human disturbances including unauthorized dirt bike ramps, encampment related trash, and fires.

Peruvian Pepper Tree – Coast Live Oak Woodland

Peruvian pepper tree – coast live oak woodland occurs along the eastern edge of survey area, adjacent to the Arroyo Channel and opposite the San Rafael site. This vegetation type consists mostly of areas with large Peruvian pepper trees and coast live oaks with a closed canopy. Other tree species also occurring include blue elderberry. The understory is relatively sparse with species such as, but not limited to, mule fat (*Baccharis salicifolia* ssp. *salicifolia*), sisymbrium (*Sisymbrium* sp.), bitter gooseberry, common horehound (*Marrubium vulgare*), toyon, and brome.

This vegetation type does not correspond to a named alliance or association in Sawyer et. al. (2009). Its composition is similar to the California Sycamore – coast live oak riparian woodlands, though the cover of coast live oak is less than the required cover (i.e., greater than 50 percent) for that alliance. Since the alliance is not considered a sensitive natural community by the CDFW, the Peruvian pepper tree – coast live oak woodland within the survey area is not considered sensitive.

Disturbed Blue Elderberry – Laurel Sumac Scrub

Disturbed blue elderberry – laurel sumac scrub occurs in the north side of the survey area throughout the San Rafael site west of San Rafael Creek, in open areas to the west of the Creek that show signs of past disturbance and maintenance, and along the western edge of the survey area adjacent to the Arroyo Seco Channel. These areas are dominated by laurel sumac (*Malsoma laurina*) and blue elderberry with an open canopy. The understory is sparse, but some co-occurring species include California sagebrush, toyon, and horehound.

This vegetation type does not correspond to a named alliance or association in Sawyer et. al. (2009). Its composition is similar to the *Malosma laurina* Shrubland Alliance, though the cover of laurel sumac is less than the required cover (i.e., greater than 50 percent) for this alliance. Since this alliance is not considered a sensitive natural community by the CDFW, the disturbed blue elderberry – laurel sumac scrub within the survey area is not considered sensitive.

Non-Native Grassland

Non-native grassland occurs in a small strip in the northeastern corner of the survey area. This vegetation type is dominated by brome. This vegetation type corresponds to the *Bromus rubens – Schismus (arabicus, barbatus)* Herbaceous Semi-Natural Alliance in Sawyer et. al. (2009). Being dominated by a non-native species, it is not considered a sensitive natural community by the CDFW.

Non-Native Ornamental Woodland

Non-native ornamental woodland consists of areas with non-native ornamental landscaped trees and occurs in linear areas in the Arroyo Seco Channel and throughout the central portion of the San Pascual site. In the survey area, this vegetation type includes trees such as Brazilian pepper tree, eucalyptus, Mexican fan palm, Chinese elm, carob, shamel ash, and chitalpa.

Bare Ground

Bare ground consists of undeveloped areas devoid of any vegetation. Bare ground areas in the survey area includes the unpaved trails on either side of the Arroyo Seco Channel.

Disturbed

Disturbed areas show signs of past disturbance and are unvegetated or contain sparse weedy vegetation. Disturbed areas in the survey area occur at the intersection of San Pascual Avenue and Stoney Drive adjacent to the channel at the northeast corner of the San Pascual site.

Developed

Developed areas in the survey area consist of paved roads and highways, buildings and structures, and concrete flood control facilities (i.e., Arroyo Seco Channel and San Rafael Creek). One additional developed area, the concrete bridge over San Rafael Creek, is not reflected because it located under the adjacent woodland canopy at the San Rafael site.

A discussion of individual tree resources, separate from vegetation types, is provided in the impacts section further below and reflected on Exhibits 5a and 5b, Tree Locations.

Special Status Vegetation Types

The CDFW Vegetation Classification and Mapping Program provides a list of vegetation Alliances, Associations, and Special Stands that are considered “Sensitive Natural Communities” based on their rarity and threat (CDFW 2025d). Information on rarity is based on the range and distribution of a given type of vegetation, and the proportion of occurrences that are of good ecological integrity. Threats and trends are considered in categories like residential and commercial development; agriculture, energy production, and mining; and invasive and other problematic plant species. One vegetation type present in the survey area, coast live oak – western sycamore woodland, is considered sensitive by the CDFW.

Trees

A total of 212 trees were mapped in the survey area during the 2022 tree inventory.[1] The updated 2025 tree survey identified 17 trees that had died since 2022, along with 6 new trees that grew sufficiently to meet the minimum size for protection pursuant to the South Pasadena Municipal Code. As of October 2025, there are 201 tree resources in the Project survey area consisting of 2 carob trees (*Ceratonia siliqua*), 1 Shamel ash (*Fraxinus uhdei*), 4 toyons, 16 western sycamores, 45 coast live oaks, 1 scrub oak (*Quercus berberidifolia*), 11 black willows (*Salix gooddingii*), 1 arroyo willow, 32 blue elderberries, 5 Brazilian pepper trees (*Schinus terebinthifolia*), 1 Chinese elm (*Ulmus parviflora*), and 82 Mexican fan palms (*Washingtonia robusta*). The locations of these trees are shown on Exhibits 5a and 5b.

Jurisdictional Resources

As previously described, the survey area encompasses the two discrete Project sites, construction staging areas, and adjacent areas which are divided into three general sub-areas for ease of reference. These sub-areas include the following: (1) the San Rafael site at the northern end of the survey area, which consists of a concrete-lined drain that conveys water from adjacent residential areas located northwest of the survey area and drain into the Arroyo Seco; (2) the Arroyo Seco Channel, which consists of the concrete-lined channel extending between the Project site along with an adjacent dirt trail than runs along the eastern bank adjacent to the San Pascual Stables; and (3) the San Pascual site, a densely vegetated area that accepts flows diverted from the Arroyo Seco Channel through existing infrastructure and is located immediately northwest of Arroyo Park. Within the survey area, an interconnected drainage system flows downstream from San Rafael Creek and from the Arroyo Seco Channel and exits in part via an existing diversion into the San Pascual site and in part continuing downstream through the Arroyo Seco Channel. This drainage system is shown on Exhibits 6a and 6b, Jurisdictional Resources. A summary of these resources within the survey area is provided in Table 1.

[1] Three additional trees were mapped in 2022 that occurred outside the survey area boundary and have been removed from this report. These trees include 1 Southern California black walnut (*Juglans californica*), 1 western sycamore (*Platanus racemosa*), and 1 Brazilian pepper (*Schinus terebinthifolia*).

TABLE 1
SUMMARY OF JURISDICTIONAL RESOURCES IN THE SURVEY AREA

Survey Area	Latitude/Longitude (decimal degrees)		Feature Length (lf)	OHWM Width Range (feet)	USACE Jurisdiction (acres)		RWQCB Jurisdiction (acres)		CDFW Jurisdiction (acres)
	Upstream End	Downstream End			Wetland	Non-Wetland	Wetland	Non-Wetland	
San Rafael Creek Area	34.125844°, -118.166938°	34.124887°, -118.166877°	405	6–10	0.000	0.098	0.00	0.098	0.098
Arroyo Seco Channel	34.125528°, -118.166729°	34.119197°, -118.167141°	2,730	40–50	0.000	2.604	0.00	2.604	3.018
San Pascual Area	34.121016°, -118.167599°	34.119819°, -118.167001°	580	5–36	0.064	0.219	0.064	0.221	1.798
				Totals	**0.064**	**2.921**	**0.064**	**2.923**	**4.914**

lf: linear feet; OHWM: Ordinary High Water Mark; USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife.

Three sampling points were assessed for the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. All three points were located within the San Pascual site as it was the only portion of the survey area that contained an earthen-bottom drainage feature. One of these points, located at the southern end of the San Pascual site, was determined to contain all three wetland parameters (i.e., wetland hydrology, hydrophytic vegetation, and hydric soil). The extent to which all three of these parameters occurred in the vicinity of this sampling point defined the limit of wetland conditions in that area. The other two sampling points, located upstream within the site, did not meet the criteria for wetland conditions and are mapped as non-wetland WOTUS.

Wildlife Habitat

The survey area provides moderately suitable habitat for wildlife. It includes patches of vegetation with a high percentage of native plant cover and some connectivity between these patches and adjacent areas upstream and downstream. However, the presence of chain-link fencing, a concrete box channel, and frequent disturbance from humans and domestic dogs–particularly along trails adjacent to and within the Project area–substantially reduces the survey area's wildlife value compared to more pristine habitats in foothill or mountainous regions. Although the area does support some wildlife, it is heavily infested with non-native, weedy, and ornamental plant species. Structural barriers, such as fencing and the channelization of Arroyo Seco Creek, further limit wildlife movement. These factors, combined with high levels of human activity, significantly diminish the habitat's overall quality relative to intact, protected natural environments. Wildlife expected to occur here are typically species that are tolerant of human disturbance and urban environments. Due to the semi-natural condition of the ecosystem, many native wildlife families commonly associated with undisturbed riparian woodland systems are notably absent.

The lack of habitat in the immediate area, in general, relegates the habitat on the sites as relatively higher value to some degree due to limited availability locally. However, habitat of much greater value than that present in the Project area occurs within the region to the north within undeveloped lands of the Angeles National Forest.

No fish species were observed during the biological resource surveys on the sites and the drainages in the survey area provide minimal habitat for fish due to the limited amount, depth of surface water present, and the isolated nature of the drainages in the survey area. During storm events and/or releases from Devil's Gate Dam located approximately 4.5 miles upstream of the survey area, fish may pass through the Arroyo Seco. No native fish breeding habitat occurs in the survey area. Fish species that may occur include, but are not limited to, common species such as the non-native, historically stocked, rainbow trout (*Onocorhynchus mykiss*), green sunfish (*Lepomis cyanellus*), and western mosquitofish (*Gambusia affinis*).

No amphibian species were observed during the biological surveys. Common species that may occur include black-bellied slender salamander (*Batrachoseps nigriventris*), garden slender Salamander (*Batrachoseps major major*), California toad (*Anaxyrus boreas halophilus*), and Baja California treefrog (*Pseudacris hypochondriaca*).

One reptile species was observed during the surveys, the common side-blotched lizard (*Uta stansburiana*). Other common species that may occur include western fence lizard (*Sceloporus occidentalis*), western skink (*Plestiodon skiltonianus*), southern alligator lizard (*Elgaria multicarinata*), California kingsnake (*Lampropeltis californiae*), gopher snake (*Pituophis catenifer*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*).

Bird species observed on or adjacent to the survey area include mourning dove (*Zenaida macroura*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), Anna's hummingbird (*Calypte anna*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), northern rough-winged swallow (*Stelgidopteryx serripennis*), California scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), oak titmouse (*Baeolophus inornatus*), bushtit (*Psaltriparus minimus*), wrentit (*Chamaea fasciata*), Bewick's wren (*Thryomanes bewickii*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), hooded oriole (*Icterus cucullatus*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), and yellow-rumped warbler (*Setophaga coronata*).

Two mammal species were observed during the surveys, California ground squirrel (*Otospermophilus beecheyi*) and woodrat (*Neotoma* spp.) (middens). Other common species that may occur include, but are not limited to, Botta's pocket gopher, (*Thomomys bottae*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). Common bat species with potential to forage in the survey area include canyon bat (*Parastrellus hesperus*).

Wildlife Movement

Within large open space areas where few or no man-made or naturally occurring physical constraints to wildlife movement are present, wildlife corridors may not yet exist. However, once open space areas become constrained and/or fragmented as a result of urban development or the construction of physical obstacles (e.g., roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food, and water and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

The survey area is located at the urban-wildland interface. Residential development, stables, community parks, parking lots, roadways, and flood control facilities surround the survey area. Within the survey area, pedestrian, bicyclist, and/or equestrian use is moderate to high in some areas and low in others. In the San Rafael portion of the site, vehicular use is typically restricted to occasional maintenance vehicles along the channel. Pedestrian and equestrian use is mainly limited to the walkways running along the east side of the Arroyo Seco Channel (just east of the Project site) and in the northern portion of the site just outside the fenced portion of the channel. In the San Pascual portion, moderate to high vehicular use occurs along all but the western side of the site, which abuts the channel, on San Pascual Avenue, Stoney Drive, and the Arroyo South Soccer Field parking lot. A dirt trail used by pedestrians and equestrians runs along the eastern side of the site and a chain-link fence runs along the western edge.

Wildlife movement through the survey area consists largely of species prevalent in urban or suburban landscapes such as common resident and migratory birds and invertebrates, reptiles, and amphibians able to persist in small habitat patches and within developed lands. Small- and medium-sized mammals, such as coyote, woodrat, common raccoon, striped skunk, and Virginia opossum are also expected to move through the Project area. Regional movement for these species may occur to a greater degree along green belts such as the Arroyo Seco but movement is also expected to occur throughout the surrounding suburban landscape. Therefore, the survey area is not expected to support a critical regional movement pathway for any local native species.

Special Status Plant and Wildlife Species

Plants or wildlife may be considered “special status” due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts.

Special Status Plants

Fifty-six special status plant species have been reported in the vicinity of the survey area (CNPS 2025; CDFW 2025a) [summarized in Table 1 of the *Focused Special Status Plant Survey Report for the Arroyo Seco Water Reuse Project* (Psomas 2025, Appendix B)].

Of the 56 species reported from the literature review, 5 species are federally and/or State-listed Endangered, Threatened, or are candidates for listing: marsh sandwort (*Arenari paludicola*), Braunton’s milk-vetch (*Astragalus brauntonii*), Nevin’s barberry (*Berberis*

nevinii), San Fernando Valley spineflower (*Chorizanthe parryi* var*. fernandina*), and slender-horned spineflower (*Dodecahema leptoceras*).

None of these species have potential to occur within the survey area either due to lack of detection during focused surveys, lack of suitable habitat, or because the survey area is outside the known range.

In addition to species formally listed by the resource agencies, 51 species reported in the vicinity of the survey area have a CRPR. One list 4.3 species, club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*), and one list 4.2 species, Plummer's mariposa-lily (*Calochortus plummerae*), have limited potential to occur due to the presence of marginally suitable habitat. The Project site contains suitable habitat for three list 4.2 species, southern California black walnut, San Gabrial oak, and Englemann oak. However, none of these species were observed in the survey area and so are not expected to occur. The remainder of these 48 species do not have potential to occur in the survey area due to a lack of potentially suitable soils and/or habitat.

Special Status Wildlife

A total of 27 special status wildlife species have been reported in the vicinity of the survey area (CDFW 2025a). Of the species reported from the literature review, ten species are federally and/or State-listed Endangered or Threatened or are candidates for listing: Crotch's bumble bee (*Bombus crotchii*), Santa Ana sucker (*Catostomus santaanae*), arroyo toad (*Anaxyrus californicus*), southern mountain yellow-legged frog (*Rana muscosa*), western spadefoot (*Spea hammondii*), western pond turtle (*Emys marmorata*), southwestern willow flycatcher (*Empidonax traillii extimus*), burrowing owl (burrow and wintering sites) (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), bank swallow (*Riparia riparia*), coastal California gnatcatcher (*Polioptila californica californica*), and mountain lion (Southern California/Central Coast Evolutionarily Significant Unit [ESU]) (*Puma concolor*).

None of these species are expected to occur in the survey area due to a lack of potentially suitable habitat or the presence of significant movement barriers (e.g., fenced concrete box channel, major freeways) such as for the mountain lion. Limited marginal potentially suitable foraging habitat for Crotch's bumble bee is present but nesting is not expected due to thick weedy thatch covering the ground, a lack of a robust suite of nectaring sources, and human disturbances.

In addition to species formally listed by the resource agencies, 11 special status species (i.e., California Species of Special Concern) have been reported near the survey area. Six of these species, the San Diegan tiger whiptail, San Diego desert woodrat, pallid bat, Townsend's big-eared bat, western red bat, western yellow bat, and western mastiff bat may occur in the survey area. The western red bat and western yellow bat may roost within the survey area, while the rest of the bat species are only expected for foraging as no potentially suitable roosting habitat is present. The remaining seven species are not expected to occur in the survey area due to lack of suitable habitat.

Critical Habitat

Critical Habitat is designated by the USFWS for the survival and recovery of species listed as Threatened or Endangered under the Federal Endangered Species Act. Areas designated as Critical Habitat include the physical or biological features that are essential to the survival and eventual recovery of that species. The survey area does not include any designated or proposed Critical Habitat areas for any species.

PROJECT IMPACTS

To evaluate the potential impacts on biological and jurisdictional water resources, it is necessary to understand the various Project components and whether their effects are direct or indirect and/or temporary or permanent. Exhibits5a–b, and 6a–b illustrate both the survey area and the Projects limits of disturbance (i.e., construction footprint) and staging areas. For the San Rafael site, four separate, irregularly-shaped, areas at the Project footprint boundary have been identified for staging and collectively encompass 0.30 acre. For the San Pascual site, the paved parking lot with approximately 18 spaces that serves the adjacent ballfields in the southeast corner of the San Pascual Avenue and Stoney Drive, in South Pasadena, has been identified as a staging and laydown area. The staging area at the San Pascual site encompasses 0.25 acre. The following impact analysis considers the extent of adverse effects within the Project's disturbance footprint (i.e., permanent impact area) and staging areas (i.e., temporary impact area).

As discussed further below, the Project's implementation would have no net effect on biological or jurisdictional water resources because: (1) they would not represent any permanent conversions from native to non-native vegetation/unvegetated landcover, (2) the effects are temporary, and/or (3) recommended measures would reduce impacts to less than significant.

Vegetation Types and Other Areas

The Project would temporarily and permanently impact a variety of vegetation types. However, most of these impacts, at both the San Rafael and San Pascual sites, are either minimal in extent (under one acre of an individual vegetation type) and/or would affect degraded and/or non-native/ornamental vegetation or unvegetated areas. Acreage of both temporary and permanent impacts are listed in Table 2, Summary of Impacts to Vegetation Types and Other Areas, below. The sole native and sensitive vegetation present in the survey area is 1.23 acres of coast live oak-western sycamore woodland on the San Pascual site, as shown in italics in Table 2. Non-native and/or invasive vegetation types plus bare ground, developed, and disturbed areas encompass approximately 66 percent of the Project site.

TABLE 2
SUMMARY OF PROPOSED IMPACTS
TO VEGETATION TYPES AND OTHER AREAS

Vegetation Type	San Rafael Site Impacts (acres)		San Pascual Site Impacts (acres)		Total Impacts (acres)	
	Temp	Perm	Temp	Perm	Temp	Perm
Disturbed coast live oak woodland	0.00	0.066	0.00	0.00	0.00	0.066
Coast live oak – western sycamore woodland	*0.00*	*0.00*	*0.00*	*1.234*	*0.00*	*1.234*
Peruvian pepper tree – coast live oak woodland	0.00	0.00	0.00	0.00	0.00	0.00
Non-native ornamental woodland	0.00	0.00	0.00	0.705	0.00	0.705
Disturbed blue elderberry – laurel sumac scrub	0.143	1.288	0.00	0.00	0.143	1.288
Non-native grassland	0.00	0.00	0.00	0.00	0.00	0.00
Bare ground	0.098	0.056	0.00	0.00	0.098	0.056
Developed	0.011	0.009	0.25	0.133	0.261	0.142
Disturbed	0.00	0.00	0.00	0.137	0.00	0.137
TOTALS	**0.252**	**1.419**	**0.25**	**2.209**	**0.502**	**3.628**

As shown, a total of 3.63 acres of vegetation types and other areas (i.e., bare ground, developed, and disturbed areas) occur within the Project survey boundary. Within the San Pascual site, 1.23 acres of coast live oak-western sycamore woodland (a CDFW sensitive vegetation type) would be impacted. As noted above, this is the only sensitive vegetation type within the survey area. However, these impacts are associated with the removal of non-native species and installation of additional native plants representative of this vegetation type within the same area.

Introducing additional native plant species through restoration efforts will increase plant species richness (the total number of unique species present) and diversity (relative abundance of individuals among species), which in turn is expected to attract a wider range of invertebrate and vertebrate species, many of which are currently absent from the Project site. Restoration activities would include the installation of container stock and seed mixes that include a high diversity of native shrubs, vines, and annual and perennial broadleaf herbs and grasses, sourced locally. These plantings would enhance herbaceous groundcover, reduce erosion, and promote shrub and vine establishment within open canopy and edge areas. Within and adjacent to the wetland feature, restoration efforts would incorporate native riparian and wetland plant types to improve hydrologic function, stabilize soils, and enhance habitat structural complexity. Short-term irrigation and removal of competing non-native plants will help the native vegetation establish quickly and develop more robustly.

For the reasons described above, the Project is expected to result in a net benefit to coast live oak-western sycamore woodland vegetation and greatly improve habitat functions and values for native species of the region compared to the existing condition. Therefore, Project impacts on vegetation types and other areas would be considered less than significant.

Jurisdictional Areas

The proposed modifications include modifying the side wall and channel bottom of the San Rafael Creek to divert water into water treatment wetlands in areas that are currently uplands. The greater extent of Project-related impacts to jurisdictional resources would occur at the San Pascual site, which would be regraded to accommodate proposed facilities to treat water diverted from the Arroyo Seco Channel for subsequent re-use. Impacts to these jurisdictional areas are discussed further below and are shown on Exhibits 6a and 6b.

Impacts to USACE WOTUS would result from creating a diversion structure within San Rafael Creek. This would be a permanent impact to WOTUS, though it would not affect flows to downstream waters other than a beneficial impact through improving the quality of the water flowing into the Arroyo Seco Channel from the San Rafael Creek drainage area. Permanent impacts to WOTUS would occur in the San Pascual site from grading activities and vegetation removal to construct the proposed facilities. A summary of Project impacts related to WOTUS is provided in Table 3.

TABLE 3
SUMMARY OF PROPOSED IMPACTS TO "WATERS OF THE U.S."

Agency	Impact Type	Impacts (acres)			Total
		San Rafael Site	Arroyo Seco Channel	San Pascual Site	
Wetlands					
USACE	Existing	0.000	0.000	0.064	**0.064**
	Permanent	0.000	0.000	0.064	**0.064**
	Temporary	0.000	0.000	0.000	**0.000**
Non-wetland waters					
USACE	Existing	0.098	2.604	0.219	**2.921**
	Permanent	0.001	0.000	0.219	**0.220**
	Temporary	0.000	0.000	0.000	**0.000**
USACE: U.S. Army Corps of Engineers					

Impacts to RWQCB "waters of the State" largely mirror those of WOTUS. The construction of a diversion structure is considered a permanent impact to the unvegetated concrete-lined San Rafael Creek. The Project proposes a concrete cap or bridge over San Rafael Creek. While the USACE regulates only discharges to jurisdictional waterways, the RWQCB typically considers the installation of structures that cover channels (e.g., the concrete cap/bridge over the San Rafael Creek) to be a permanent, though indirect, impact because it may have an impact on water quality. Impacts to jurisdictional "waters of the State" slightly exceed those of WOTUS at the San Pascual site because the basin includes an existing side channel that drains adjacent upland areas into the San Pascual site. This side channel is not considered WOTUS but still falls under the jurisdiction of the Los Angeles RWQCB as an isolated feature. A summary of Project impacts related to "waters of the State" under the jurisdiction of the Los Angeles RWQCB is provided in Table 4.

TABLE 4
SUMMARY OF PROPOSED IMPACTS TO
LOS ANGELES RWQCB "WATERS OF THE STATE"

Agency	Impact Type	Impacts (acres)			Total
		San Rafael Creek	Arroyo Seco Channel	San Pascual Basin	
Wetlands					
RWQCB	Existing	0.000	0.000	0.064	**0.064**
	Permanent	0.000	0.000	0.064	**0.064**
	Temporary	0.000	0.000	0.000	**0.000**
Non-wetland Waters					
RWQCB	Existing	0.098	2.604	0.221	**2.923**
	Permanent	0.008	0.000	0.221	**0.229**
	Temporary	0.000	0.000	0.000	**0.000**
RWQCB: Regional Water Quality Control Board					

Impacts to CDFW jurisdictional waters would result from modifications to San Rafael Creek for the creation of the diversion structure to allow water to reach the proposed treatment wetlands. The proposed construction of the concrete cap/bridge over San Rafael Creek would likely not be considered as an impact by the CDFW because there is no aquatic habitat in the concrete channel to be affected. A summary of Project impacts to CDFW jurisdictional areas is provided in Table 5.

TABLE 5
SUMMARY OF PROPOSED IMPACTS TO
CDFW JURISDICTIONAL WATERS

Agency	Impact Type	Impacts per Project Area (acres)			Total
		San Rafael Creek	Arroyo Seco	San Pascual Basin	
CDFW	Existing	0.098	3.018	1.798	**4.914**
	Permanent	0.001	0.000	1.617	**1.618**
	Temporary	0.000	0.000	0.000	**0.000**
CDFW: California Department of Fish and Wildlife					

As impacts to jurisdictional waters would result from the Project, as described for each agency above, the Project would acquire jurisdictional permits pursuant to the Clean Water Act prior to any impacts on jurisdictional resources. Pasadena must ensure implementation of and compliance with all measures required by the RWQCB, USACE, and CDFW permits. Compensatory mitigation may include restoration (i.e., reestablishment or rehabilitation), establishment (i.e., creation), enhancement, and/or preservation of jurisdictional resources. Compensatory mitigation may occur through permittee-responsible mitigation, payment to an in-lieu fee program, or purchase of compensatory mitigation credits from an approved mitigation bank. As part of the required permitting process, mitigation ratios (i.e., the amount of mitigation acreage compared to the amount of impacted habitat) would be negotiated with

the regulatory agencies with a minimum 1:1 replacement of impacted jurisdictional resources with jurisdictional resources of equivalent or higher quality habitat value.

A temporary bridge would span the Arroyo Seco Channel to have access to the San Rafael site that would accommodate the potential weight of all anticipated construction vehicles. The abutments on either side of the temporary bridge would not touch the limits of the Channel itself. Therefore, there would be no impacts to jurisdictional features related to the temporary bridge at the San Rafael site.

Further details related to USACE, RWQCB, and CDFW jurisdictional impacts can be found in the Jurisdictional Delineation Report (Psomas 2023).

Wildlife Movement

Implementation of the Project components would create a temporary constraint to localized wildlife movement during construction. Local wildlife may avoid the sites during periods of higher than usual noise and activity in general as is expected during site construction. However, given the small size of the sites, most wildlife are expected to utilize a variety of alternative routes through the area with little to no impact on daily routines. Following construction, the Project is not expected to create any additional constraints to wildlife movement and local wildlife are expected to move throughout the Project sites and surrounding areas in a similar manner to existing conditions. Therefore, impacts on temporary and long-term wildlife movement would be considered less than significant.

Special Status Plant Species

No special status plants were observed in the survey area during focused special status plant surveys for the Project. No impacts to special status plants are expected to occur during Project implementation; therefore, no mitigation would be required.

Special Status Wildlife Species

No impacts on federally or State-listed species would occur. While several other special-status wildlife species (e.g., CDFW Species of Special Concern) have the potential to occur within the Project sites, any use of the area would be sporadic, transient, and limited to low numbers of individuals. The Project sites do not provide suitable habitat for breeding, nesting, roosting, or other essential life-history functions for these species. As a result, even if individuals were present at the onset of construction, Project activities would not result in the loss of habitat necessary to sustain local or regional populations, nor would they interfere with population viability. Accordingly, potential effects would be less than significant, and no mitigation is required. Roosting bats are discussed further below.

OTHER CONSIDERATIONS

Protected Trees

As described above, the Project would pass through three cities that regulate impacts to trees: Pasadena, South Pasadena, and Los Angeles. The boundaries of these cities are represented on Exhibits 5a and 5b, Tree Locations. Additionally, CDFW regulates the removal of native trees associated with stream channels. The following is a summary of how

each jurisdiction addresses tree preservation and removal. Detailed tree data is located within the Tree Report (Psomas 2026).

City of Pasadena

Trees that are regulated by the City of Pasadena are described in Chapter 8.52 of the Pasadena Municipal Code, hereinafter referred to as the Pasadena Tree Ordinance. Under the Pasadena Tree Ordinance, removal of or injury to any protected trees requires a permit from Pasadena. Protected trees include native trees that have a trunk diameter at breast height (dbh) of at least 8 inches and various other non-native "specimen" trees of varying minimum sizes as provided in the Pasadena Tree Ordinance. The Pasadena Tree Ordinance also protects any tree designated as a "landmark" tree (trees having significant cultural or historical importance). Native trees that are specified in the Pasadena Tree Ordinance include California buckeye (*Aesculus californica*), white alder (*Alnus rhombifolia*), Southern California black walnut (*Juglans californica*), native oaks (coast live oak [*Quercus agrifolia*], scrub oak [*Q. berberidifolia*], canyon oak [*Q. chrysolepis*], Engelmann oak [*Q. engelmannii*], and valley oak [*Q. lobata*]), western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremonttii*), black cottonwood (*Populus trichocarpa*), arroyo willow (*Salix lasiolepis*), and California bay laurel (*Umbellularia californica*).

Tree replacement requirements for the City of Pasadena are determined by a matrix that indicates tree replacement quantities and sizes based on the size of the tree to be removed. This tree replacement matrix indicates the following:

- Trees with a dbh between 8 and 12.9 inches are to be replaced with 6 15-gallon trees or 3 24-inch box trees;
- Trees with a dbh between 13 and 18.9 inches are to be replaced with 8 15-gallon trees or 4 24-inch box trees or 2 36-inch box trees;
- Trees with a dbh between 19 and 36.9 inches are to be replaced with 8 24-inch box trees or 4 36-inch box trees;
- Trees with a dbh of at least 37 inches are to be replaced with 12 24-inch box trees or 8 36-inch box trees

City of South Pasadena

Pursuant to Ordinance No. 2409 (Tree Ordinance) that was approved on December 17, 2025, the City of South Pasadena defines "protected trees" as the following species that have a trunk dbh of at least 4 inches: various oak species including coast live oak; California bay laurel; desert willow (*Chilopsis linearis*); Catalina ironwood (*Lyonothamnus floribundus*); western sycamore (also commonly known as California sycamore) as well as other sycamore species (*Platanus* spp.); toyon (*Heteromeles arbutifolia*); Southern California black walnut (*Juglans californica*); hollyleaf cherry (*Prunus ilicifolia*); heritage trees (trees specifically designated by City Council as having historical value); and any other trees designated by the South Pasadena Public Works Department.

In addition to protected tree species, the Tree Ordinance defines "significant trees" as any other species that has a minimum dbh of 12 inches. Trunk dbh for multi-trunk trees is determined by combining the diameters of all trunks.

The Tree Ordinance defines “restricted trees in a fire hazard severity zone” as any species identified by the South Pasadena Public Works Department that cannot be planted in a High or Very High Fire Severity Zone.

A tree removal permit from the City of South Pasadena is required for the removal of any protected, significant, or fire hazard zone restricted trees. As part of the tree removal permit approval, replacement trees (24-inch box container) shall be provided for each protected or significant tree at a rate of 2 replacement trees for every 16-inch increment of trunk diameter of trees to be removed.

Pursuant to Chapter 34.9(d) of the Tree Ordinance, the City of South Pasadena is exempt from the provisions of the Tree Ordinance if a report is provided to the South Pasadena Public Works Director by a Certified Arborist.

City of Los Angeles

The City of Los Angeles regulates trees that are designated as “protected trees” as defined by Section 17.02 of the Los Angeles Municipal Code, hereafter referred to as the Los Angeles Native Tree and Shrub Protection Ordinance (LANTSPO). This category includes all native oak trees, Southern California black walnuts, western sycamores, California bay laurels, toyon, and blue elderberry (*Sambucus nigra* ssp. *caerulea*) that have a minimum trunk dbh of 4 inches. Additionally, the City of Los Angeles requires that all non-protected trees with a minimum dbh of 8 inches are documented. A total of 11 trees (of which 6 are protected) would be removed within the Los Angeles city boundaries.

The LANTSPO requires replacement of protected tree species at a ratio of four replacement trees for each protected tree to be removed.

California Department of Fish and Wildlife

Many trees on the survey area are also subject to regulation by the *California Fish and Game Code*. The CDFW is charged with issuing Streambed Alteration Agreements that would allow for the removal of native tree species that occur within the bed, channel, or bank of any river, stream, or lake. The minimum size requirement for regulation by the CDFW is two inches dbh. Mitigation/replacement ratios for trees within CDFW jurisdiction is based on the size of the tree dbh (i.e., mitigation ratios increase as the size of the impacted tree increases). It should be noted that many trees on the survey area are subject to regulation by both the various city tree ordinances described above and the *California Fish and Game Code.*

A total of 38 trees would be removed or encroached upon that fall under the CDFW’s jurisdiction within the riparian habitat identified as part of this assessment (10 of these trees are toyon and blue elderberry that CDFW often considers as large shrubs and may not require compensatory mitigation). The Project would acquire appropriate jurisdictional approval from the cities of Pasadena, South Pasadena, and Los Angeles, as applicable, prior to tree removal or trimming. It is anticipated that 3 of the removed trees would be solely under CDFW jurisdiction (i.e., trees that do not overlap removals regulated by the cities). The precise number of replacement trees would be dependent on negotiation with the CDFW during the Streambed Alteration Agreement permitting process, subsequent to the

California Environmental Quality Act (CEQA) process, but would be a minimum of a 1:1 replacement ratio.

Summary of Tree Impacts

A total of 201 trees or shrubs (shrubs of a scale or trunk size, dependent on species, that are considered trees; hereinafter collectively referred to solely as trees) were surveyed within the San Rafael and San Pascual sites as being under the jurisdiction of either Pasadena, South Pasadena, or Los Angeles. Of these, a total of 136 trees would be removed or would experience encroachment, including 6 protected trees for the city of Pasadena, 6 protected trees for the city of Los Angeles, and 17 protected trees and 14 significant trees for the city of South Pasadena. Tree encroachment is assumed to result in tree loss and therefore requires replacement as a worst-case scenario. This requirement is intended to capture any potential losses from encroachment, which are typically lower than anticipated during construction. Most of the affected trees are located at the San Pascual site. The remaining combined total of 65 trees that would not be removed or encroached upon at both sites, would be protected during construction through biological monitoring, as outlined in Recommendation 2 further below. Recommendation 2 stipulates that prior to initiation of construction activities, protective fencing shall be placed around the critical root zone of all trees that are in the Project construction area and are intended to remain in place. No ground disturbance or storage of construction materials should occur within the critical root zone during construction. A Certified Arborist shall be retained to monitor construction activities of any ground disturbance planned within or adjacent to the critical root zone for any tree to be preserved during construction.

Although the San Pascual site contains linear clusters of palm trees that will require removal, this area does not represent a native woodland community and does not function as high-value habitat. The clustered trees on site occur within a small, isolated urban setting and are composed largely of non-native ornamental palms and other introduced species. As a result, the tree clusters lack the structural and biological characteristics that define native woodland habitat, such as multi-layered canopy development, native forage resources, and a diverse understory. Due to the non-native species composition, absence of native habitat structure, and lack of connectivity to surrounding natural areas, the existing tree clusters support low biological value. Wildlife use in these areas is generally limited to common urban-tolerant species that rely on developed landscapes rather than native plant communities. The presence of non-native palm trees in a cluster does not, on its own, indicate elevated habitat value. Habitat value is based on ecological function, species composition, and landscape context.

Table 6 provides the number of existing trees, total proposed tree removals, total protected tree removals, and required tree replacements broken down by each city within the Project site but not including trees under CDFW jurisdiction.

TABLE 6
SUMMARY OF TREE REMOVALS AND REPLACEMENTS

Jurisdiction	Existing Trees within Site	Total Tree Removals	Protected Tree Removals	Required Tree Replacements	Proposed Tree Replacements
San Rafael Site					
Pasadena	28	6	6	26*	61
Los Angeles	16	0	0	0	0
San Rafael Subtotals	*44*	*6*	*6*	*26*	*61*
San Pascual Site					
South Pasadena	135	119	31**	0***	107
Los Angeles	22	11	6	24	48
San Pascual Subtotals	*157*	*130*	*37*	*24*	*155*
Project Totals	***201***	***136***	***43***	***50***	***216***

Source: Psomas 2026
Note: Removals include encroachments.*Replacement quantity based on installation of 24-inch box trees.
**Includes 17 protected trees and 14 significant trees.
***South Pasadena is exempt from the tree replacement requirements of its Tree Ordinance.

As discussed above, pursuant to Chapter 34.9(d) of the Tree Ordinance, the City of South Pasadena is exempt from the provisions of the Tree Ordinance. Nonetheless, if the Project were not exempt under this Ordinance, the Project would be required to plant 164 replacement trees at the San Pascual site. Although, per the City of South Pasadena's current Tree Ordinance, no replacement trees would be required within South Pasadena's portion of the San Pascual Site, as detailed in the table above, the Project proposes the planting of 155 trees at the San Pascual site.

Based on application of each city's tree ordinance, the Project is expected to require a total of 26 replacement trees for the city of Pasadena (24-inch box containers) and 24 replacement trees for the city of Los Angeles (15-gallon containers). The city of South Pasadena is exempt from tree planting requirements pursuant to Chapter 34.9(d) of the South Pasadena Tree Ordinance. Additional replacement trees may be required via negotiations with the CDFW to acquire a Streambed Alteration Agreement (per Section 1602 of the *California Fish and Game Code*). CDFW typically bases tree replacement ratios based on the size of trees to removed, and these replacement ratios will be determined as part the permit negotiation process.

The replacement trees proposed under the Project consist of native species that are ecologically appropriate for the region and consistent with the vegetation community and long-term habitat goals of the restoration plan. While newly planted native trees will initially be smaller in stature than the non-native trees being removed, they will provide greater ecological value over time, including improved compatibility with adjacent native woodland and riparian habitats, enhanced support for native wildlife, reduced demand for water and maintenance, and decreased fire hazard. The restoration effort focuses on establishing a self-sustaining, native tree canopy that will mature over time to replace and ultimately exceed the functional habitat value of the existing non-native trees. In addition, methods such as irrigation and monitoring will ensure healthy establishment and accelerated growth during the initial establishment period.

Native oak woodlands support a complex structure that includes a broad canopy and an abundance of cavities, acorns, foliage, and insect biomass. Oak woodlands are widely recognized as biologically rich habitats that support high insect and arthropod diversity (Swiecki and Bernhardt 2006). Research in California has shown that oak woodlands may contain several thousand insect and arachnid species within a single woodland acre (Little 2001). Oaks also function as keystone hosts for insect order Lepidoptera (butterflies and moths) and support more specialist caterpillar species than many other woody genera, resulting in high insect biomass that is especially important for nesting birds (Valencia-Cuevas et al. 2015). This structural and biological diversity provides nesting sites, foraging opportunities, and cover for a wide range of wildlife species. Birds in particular benefit from the many resources offered by oak woodlands, which support insectivorous, granivorous, and cavity-nesting species throughout the year. In contrast, tree groupings dominated by non-native ornamental species, such as palms, typically lack these structural and biological attributes, support fewer native insects, and provide limited wildlife foraging and nesting opportunities. For these reasons, native oak woodland generally provides substantially greater ecological function and wildlife support than non-native tree assemblages.

As shown in Table 6, there were total of 201 existing trees surveyed within the Project sites, of which 136 would be encroached upon or removed. The Project's landscape concept proposes to plant a total of 216 native trees as well as native shrubs and groundcovers as part of landscaping activities. Assuming an estimated required tree replacement of 9 additional trees for the 3 tree removals that fall under solely under the CDFW's jurisdiction, this would result in an estimated net total of 282 trees on the San Rafael and San Pascual sites, in addition to new native understory (i.e., shrubs and groundcover) plantings. These figures are estimated and would be finalized as part of permitting processes with the affected agencies. However, all required tree replacements to fully meet each agency's requirements would be planted and would be located within the San Rafael and San Pascual sites. No trees or other vegetation would be removed or trimmed as part of the off-site water harvester installation.

Overall, the proposed restoration efforts would substantially enhance the long-term habitat value of the Project site. Although the existing trees are large in stature, their non-native composition provides limited ecological function and lower wildlife value compared to a diverse, native woodland community. Tree height alone does not equate to habitat quality, particularly when canopy structure, species composition, and resource availability for native fauna are limited. The proposed restoration, which emphasizes a high diversity of native trees, shrubs, vines, and herbaceous species, would improve structural complexity, enhance foraging and nesting opportunities, and support a broader range of native wildlife. Over time, as the native vegetation matures, the restored habitat would provide greater ecological function, stability, and resilience than the existing non-native, degraded conditions.

Nesting Raptors

Raptor species (i.e., birds of prey) have the potential to nest within mature trees in and adjacent to the Project sites and their nests may be impacted by Project implementation. If construction activities occur during the raptor nesting season (i.e., generally February 1 to June 30), the loss of an active nest of any raptor species, including common raptor species, would be considered a violation of Sections 3503, 3503.5, and 3513 of the *California Fish and Game Code*. Therefore, Project impacts on nesting raptors would be considered

potentially significant. Implementation of Recommendation 3, discussed further below, is recommended to reduce the impacts to less than significant.

Nesting Birds

The Migratory Bird Treaty Act (MBTA) protects the taking of migratory birds and their nests and eggs. Bird species protected under the provisions of the MBTA are identified by the List of Migratory Birds (Code of Federal Regulations, Title 50, §10.13). On January 20, 2025, President Trump issued Executive Order 14154, directing the heads of each federal agency to "suspend, revise, or rescind all agency actions identified as unduly burdensome". On April 11, 2025, the U.S. Department of Interior took steps to reinstate policies adopted during the first Trump administration regarding the MBTA. This limited the MBTA's prohibition on "take" of migratory birds to apply only to intentional acts directed at harming or killing birds; protections against "incidental take" have been removed.

In addition, Sections 3503 and 3503.5 of the *California Fish and Game Code* protect nesting migratory birds and raptors. Impacts to nesting birds, both on and adjacent to the Project site, would be considered a significant impact prior to mitigation. For purposes of this BRA, the potential for "incidental take" is considered a significant impact. Therefore, if Project construction, on either site, is initiated during the typical breeding season for nesting birds (i.e., February 1 to September 15) and nesting raptors (i.e., as early as January 1 for some raptors to June 30), Recommendation 3 requires a pre-construction nesting bird/raptor survey to ensure compliance with the MBTA and the Fish and Game Code, and describes the process for protecting any active nests identified while construction is ongoing. If construction activities are initiated during the non-breeding season, implementation of Recommendation 3 would not be required and there would be no potential impact to nesting birds and raptors.

Roosting Bats

Several common bat species may forage throughout the Project sites and roost in mature trees or under nearby bridges. However, large roosting colonies have not been documented on or near the Project sites and are not expected to occur. Impacts on individual roosting bats, or small colonies (e.g., less than ten individuals), are a potential constraint on development. California Fish and Game Code Section 4150 classifies all bats as "nongame mammals," indicating they cannot be taken, possessed, or killed without appropriate permits. It is illegal to harm them or remove them using lethal or capture methods without obtaining necessary approvals or permits. Therefore, the Project would implement Recommendation 4, which requires a two-step tree removal process to prevent bat mortality during construction activity. Indirect impacts on individual roosting bats or small colonies may occur with Project implementation and may result in bats avoiding the site temporarily. However, the amount of habitat potentially avoided temporarily is small relative to the amount of potentially suitable habitat in the immediate vicinity of the Project site and the larger region in general. As a result, bats that may avoid the area temporarily are expected to utilize alternative habitat areas in the vicinity with little or no effect on local bat population health.

Noise

During active construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and/or denning activities for a variety of wildlife species. Construction noise could deter wildlife from using habitat located adjacent to construction activity. This impact would be considered adverse but would not be considered a significant impact because a substantial amount of similar biological conditions are present in the vicinity of the Project sites where the animals may disperse and find adequate habitat to forage, nest, roost, and/or den. Following construction, the ambient noise levels adjacent to the Project sites are not expected to materially increase above current conditions such that wildlife would avoid using the sites. The Project impacts from temporary increases in noise levels are, therefore, expected to be less than significant.

RECOMMENDATIONS

Based on the impacts assessment described above, the following mitigation measures are recommended to reduce impacts to a level of less than significant:

1. Biological Monitoring. Prior to initiation of Project construction activities, a qualified Biologist shall ensure the limits of construction are clearly marked in the field in the vicinity of natural resources to avoid impacts to special status natural resources being protected in place during construction. Field marking shall include 4-foot high, orange, construction safety fencing (snow fencing) staked at sufficient intervals to prevent failure. Safety fencing shall be maintained throughout the construction phase by the Contractor and replaced or moved as needed. The biologist shall monitor work activities on the first day of construction, during all vegetation removal, and on an as-needed basis thereafter.
2. Trees. All trees to be preserved on-site during the construction process shall have the following measures implemented:

   Prior to initiation of construction activities, protective fencing shall be placed around the critical root zone (five feet outside the outer canopy) of all trees that are in the Project construction area and are intended to remain in place. No ground disturbance or storage of construction materials should occur within the critical root zone during construction.

   A Certified Arborist shall be retained to monitor construction activities of any ground disturbance planned within or adjacent to the critical root zone for any tree to be preserved during construction.
3. Nesting Birds/Raptors. The Project shall be conducted in compliance with the conditions set forth in the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code with methods approved by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) to protect active bird/raptor nests. To avoid impacts on active nests for common and special status birds and raptors, no vegetation removal or ground-disturbing activities shall occur during avian breeding season which generally runs from February 1 through September 15 (as early as January 1 for some raptors). The applicant shall schedule vegetation clearing during the non-breeding season (i.e., September 16 to December 31) to the extent feasible. If Project timing requires that vegetation clearing occur between February 1 and September 15, the applicant or its designee shall retain a qualified

Biologist to conduct a pre-construction survey for nesting birds and raptors. The pre-construction survey shall be conducted by a qualified Biologist within three days prior to vegetation clearing. The pre-construction nesting bird survey area shall include the Project impact area (i.e., disturbance footprint) plus a 250-foot buffer to search for nesting birds and a 500-foot buffer to search for nesting raptors. If no active nests are found, no further mitigation would be required.

If an active nest is located in the pre-construction nesting bird survey area, the Biologist shall delineate an appropriate buffer to protect the nest based on the sensitivity of the species. A minimum 300-foot no disturbance buffer shall be used around each active bird nest. A protective buffer of 500 feet shall be used to protect nesting raptors and 0.5 mile for special status species (e.g., California Endangered Species Act [CESA]-listed), if feasible. If appropriate, a smaller buffer may be considered around active nests that are not considered special status species (e.g., CESA-listed). Adjustments to the buffer size may be based on site topography, existing disturbance, sensitivity of the individuals (established by observing the individuals at the nest), and the type of construction activity. Personnel working on the Project, including all contractors working on site, shall be instructed on the presence of nesting birds, area sensitivity, and adherence to no-disturbance buffers. No construction activities shall be allowed in the designated buffer until the Biologist determines that nesting activity has ended. Construction may proceed within the buffer once the Biologist determines that nesting activity has ceased (i.e., fledglings have left the nest or the nest has failed). The designated buffer will be clearly marked in the field and will be mapped as Environmentally Sensitive Areas (ESAs) on construction plans.

Prior to the initiation of construction activities, an email summary of the results shall be submitted to Pasadena with a map of any active nests found and their designated buffers. Construction shall be allowed to proceed if appropriate buffer distances are employed for all active nests. The Biologist shall then prepare a formal Letter Report describing methods used, results of the survey, recommended buffers, and/or justification for buffer reductions. The Letter Report shall be submitted to Pasadena within one week of completion of the survey. If an active nest is observed during the survey, the Letter Report shall include a map showing the designated protective buffer.

4. Bats. A two-step tree removal process shall be implemented to prevent bat mortality. Prior to tree removal, a qualified biologist shall conduct a pre-construction bat habitat assessment. If the tree potentially supports roosting bats, at the direction of the biologist, some level of disturbance (e.g., trimming of lower branches of trees) shall be applied three days prior to removal to allow bats to escape. The trees shall be removed on day three (i.e., there shall be no less or more than two nights between initial disturbance and the tree removal). On each of the three days of the tree removal process, the tree to be removed will be visually inspected by a qualified biologist to confirm no bats are roosting immediately prior to removal.

If you have any questions or comments, please contact Marc Blain at 626.351.2000.

Sincerely,
PSOMAS

Ann M. Johnston
Principal, Resource Management

Marc T. Blain
Senior Project Manager

Enclosures: Exhibit 1 – Regional Location and Local Vicinity
Exhibit 2 – U.S. Geological Survey Quadrangle Topographic Map
Exhibit 3 – Survey Area
Exhibit 4 – Vegetation Types and Other Areas
Exhibits 5a and 5b –Tree Locations
Exhibits 6a and 6b – Jurisdictional Resources
Appendix A – Jurisdictional Delineation Report
Appendix B – Special Status Plant Report
Appendix C – Tree Survey Report

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Regional Location and Local Vicinity

Exhibit 1

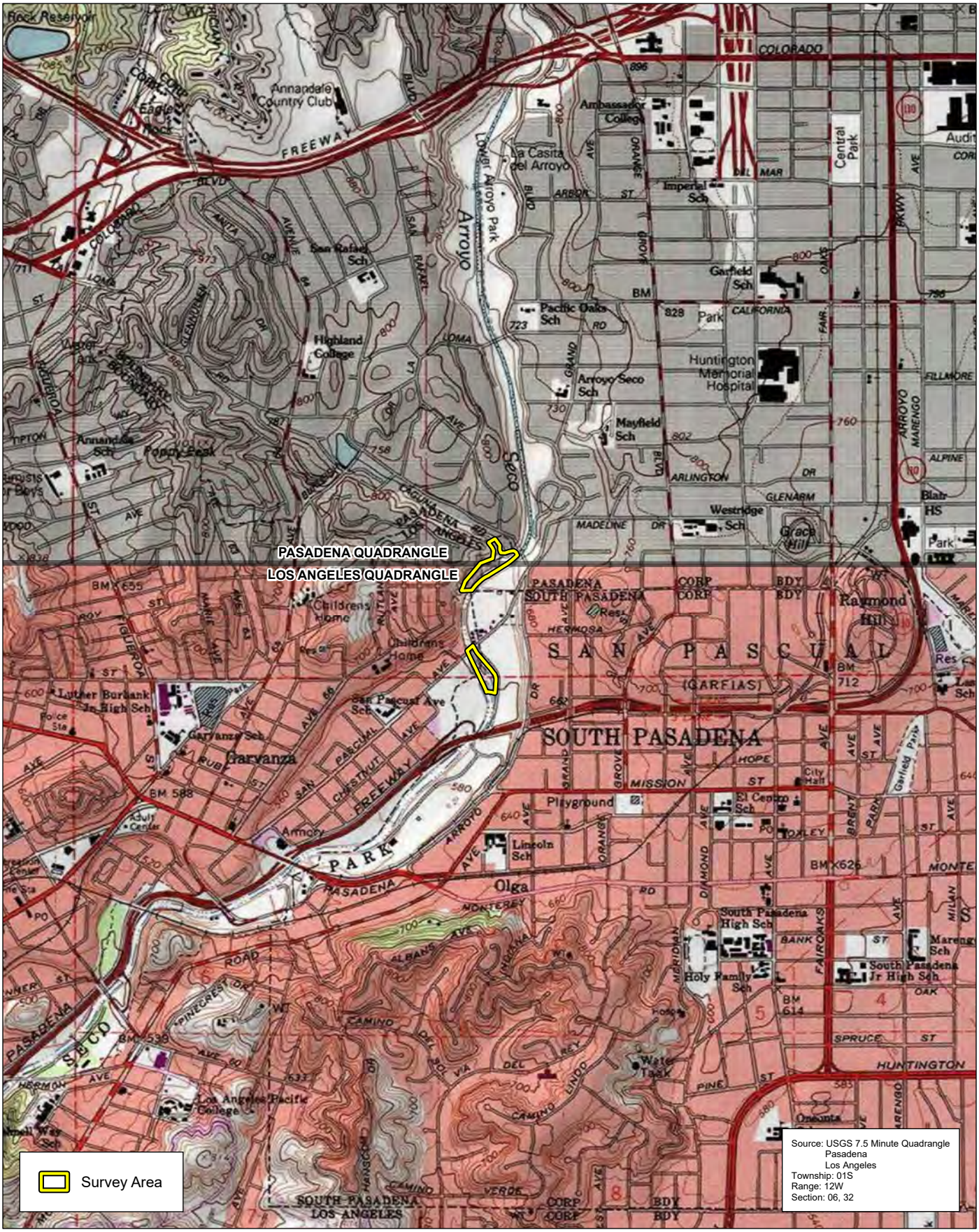
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U.S. Geological Survey Digital Quadrangle

Exhibit 2

Arroyo Seco Water Reuse Project

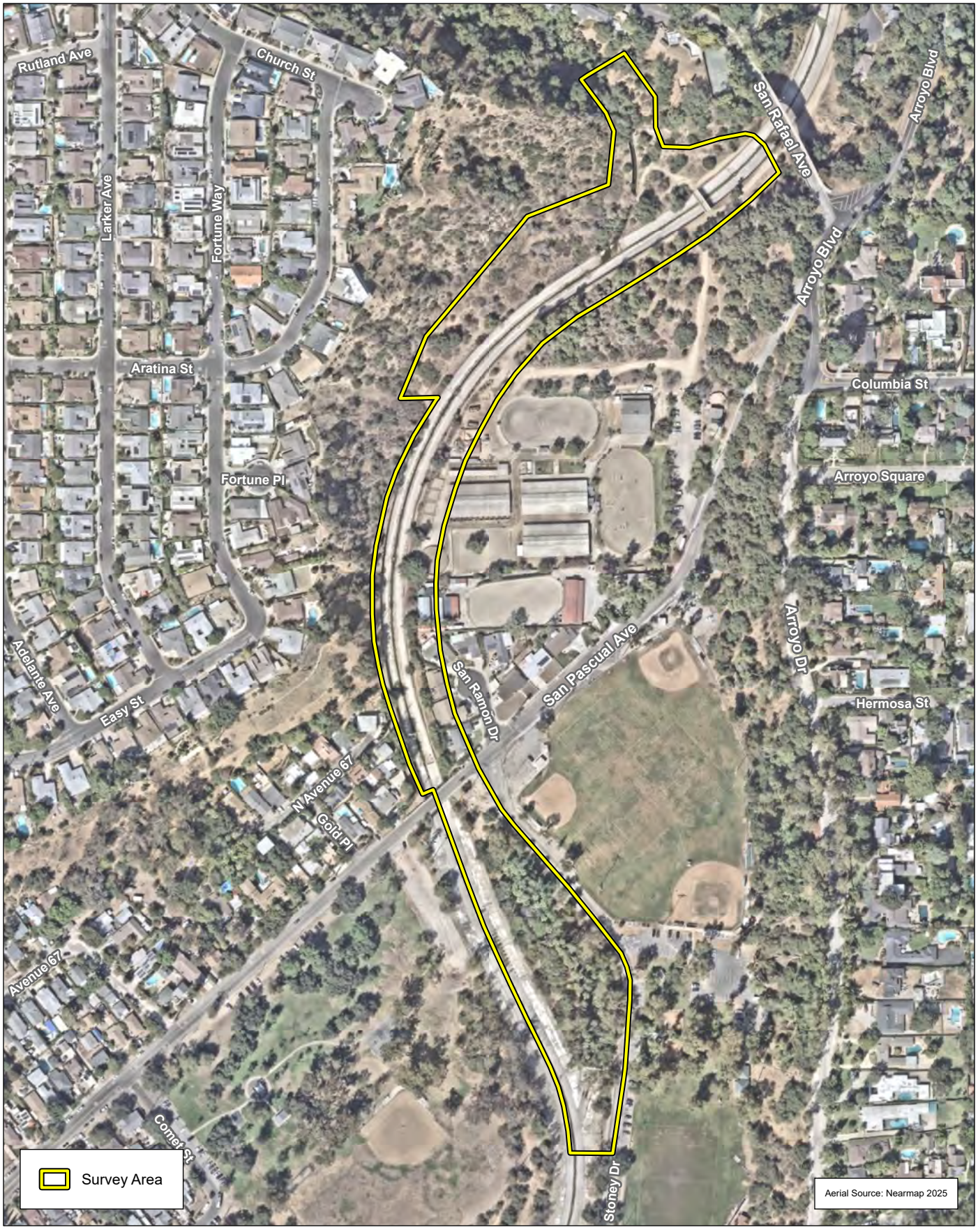
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Survey Area

Exhibit 3

Arroyo Seco Water Reuse Project

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Vegetation Types and Other Areas

Exhibit 4

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Tree Locations – San Rafael Site

Exhibit 5a

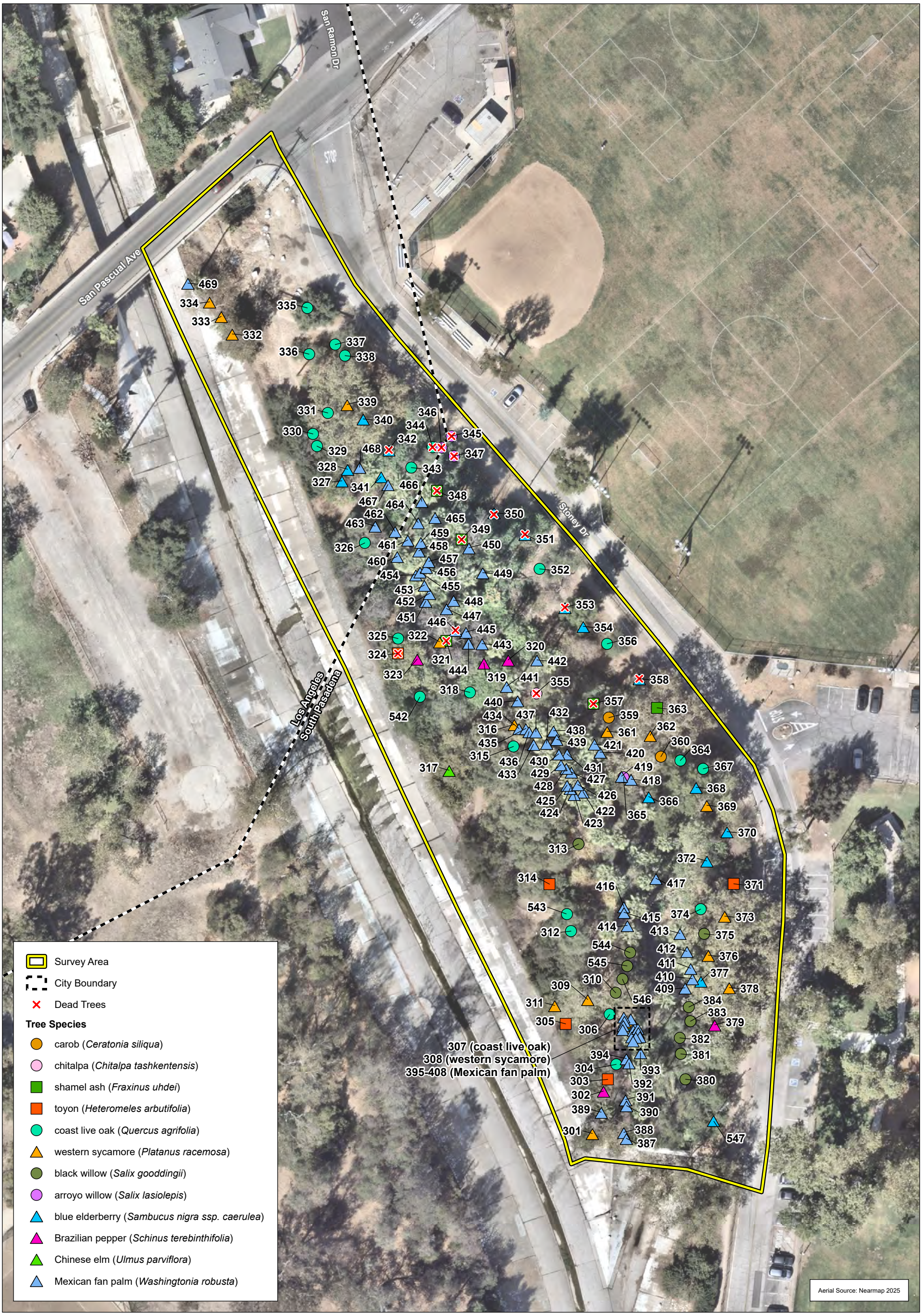
Arroyo Seco Water Reuse Project

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Tree Locations – San Pascual Site

Exhibit 5b

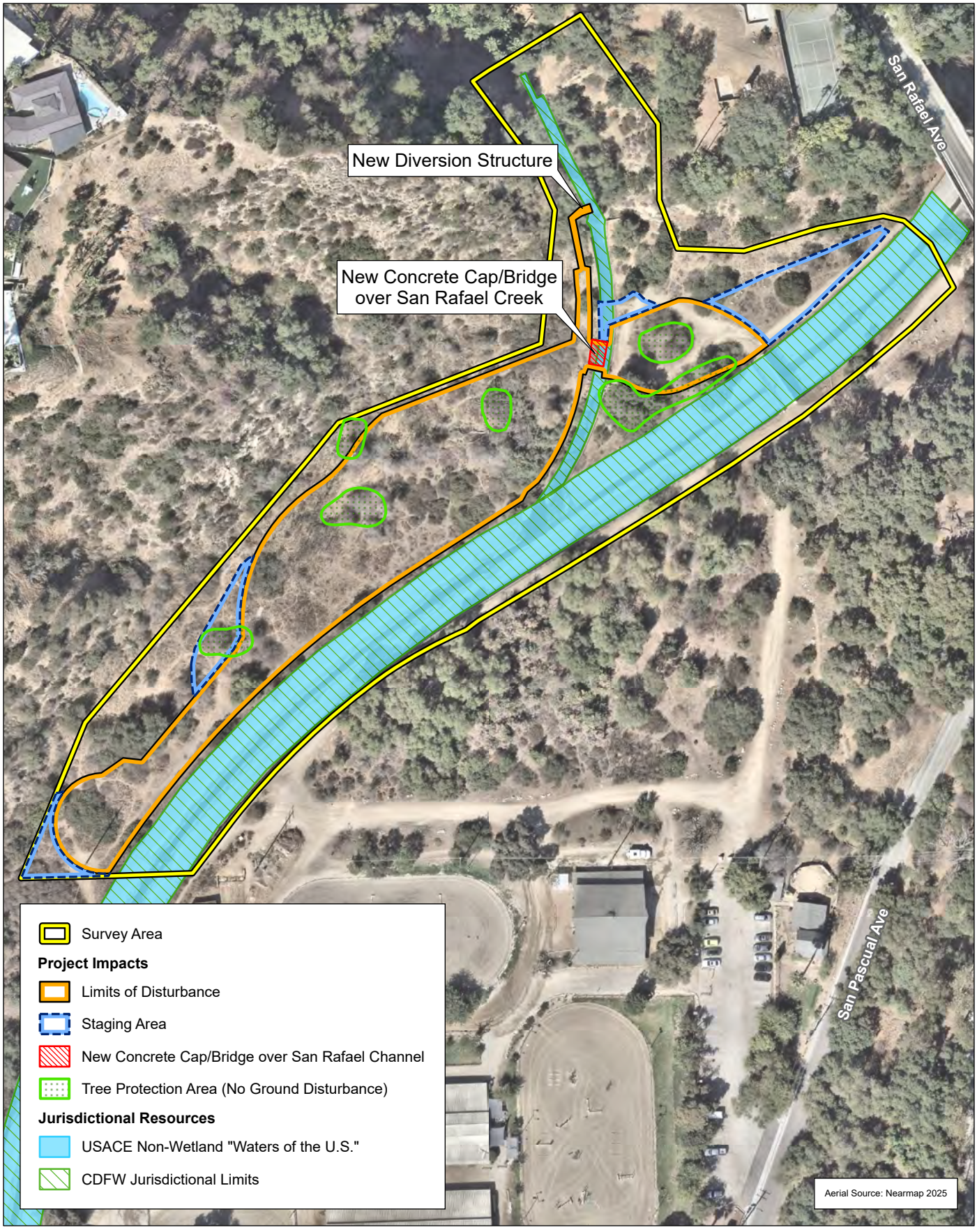
Arroyo Seco Water Reuse Project

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Impacts to Jurisdictional Waters – San Rafael Site

Exhibit 6a

Arroyo Seco Water Reuse Project

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Impacts to Jurisdictional Waters – San Pascual Site

Exhibit 6b

Arroyo Seco Water Reuse Project

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APPENDIX A

JURISDICTIONAL DELINEATION REPORT

Jurisdictional Delineation Report

Arroyo Seco Water Reuse Project
Cities of Pasadena, South Pasadena, and Los Angeles, California

Prepared for

City of Pasadena
Department of Public Works
100 North Garfield Avenue
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November 16, 2023

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Attachment

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C Literature Review Details
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EXECUTIVE SUMMARY

The purpose of this Jurisdictional Delineation Report is to provide baseline data concerning the type and extent of jurisdictional resources in the vicinity of the Arroyo Seco Water Reuse and Natural Stream Restoration Project (hereafter referred to as the Project) and to determine the amount of these resources that would be affected by the Project. The Project is located in the cities of Pasadena, South Pasadena, and Los Angeles, California. Jurisdictional resources considered for this report include wetlands and non-wetland "waters of the United States" (WOTUS) regulated by the U.S. Army Corps of Engineers (USACE); "waters of the State" regulated by the Regional Water Quality Control Board (RWQCB); and the bed, bank, and channel of all lakes, rivers, and/or streams (and associated riparian vegetation), as regulated by the California Department of Fish and Wildlife (CDFW).

The limits of non-wetland WOTUS and "waters of the State" were identified by the presence of an ordinary high water mark (OHWM) and by the width of concrete-lined storm drain channels. Wetland features were identified based on the USACE's three-parameter approach in which wetlands are defined by the presence of hydrophytic vegetation, hydric soils, and presence of wetland hydrology indicators.

The jurisdictional delineation work was performed by Psomas Regulatory Specialist David Hughes and Biologist Trevor Bristle on February 10, 2022. Three separate areas were assessed for the presence of jurisdictional waters: San Rafael Creek, Arroyo Seco Channel, and San Pascual Basin. Based on the results of the jurisdictional delineation field work, it was determined that the total amount of jurisdictional resources on the survey area is as follows:

- **USACE Jurisdictional "waters of the U.S.":**
  San Rafael Creek: 0.098 acre of non-wetlands
  Arroyo Seco Channel: 2.604 acre of non-wetlands
  San Pascual Basin: 0.283 acre (0.219 acre of non-wetlands, 0.064 acre of wetlands)

- **RWQCB Jurisdictional "waters of the State":**
  San Rafael Creek: 0.098 acre of non-wetlands
  Arroyo Seco Channel: 2.604 acre of non-wetlands
  San Pascual Basin: 0.285 acre (0.221 acre of non-wetlands, 0.064 acre of wetlands)

- **CDFW Jurisdictional Streambeds:**
  San Rafael Creek: 0.098 acre
  Arroyo Seco Channel: 3.018 acre
  San Pascual Basin: 1.798 acre

1.0 INTRODUCTION

This Jurisdictional Delineation Report has been prepared for the Pasadena Department of Public Works to provide baseline data concerning the type and extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Los Angeles Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW) that would be affected by the implementation of the Arroyo Seco Water Reuse and Natural Stream Restoration Project (hereafter referred to as the Project) located in the cities of Pasadena, South Pasadena, and Los Angeles, California.

1.1 PROJECT LOCATION

The survey area for this report is generally centered along a portion of the Arroyo Seco Channel that begins just south of the San Rafael Avenue bridge in the City of Pasadena and extends approximately ½-mile south (downstream), near the 110 freeway overpass in the City of South Pasadena (Exhibit 1). The survey area encompasses the two discrete Project sites, construction staging areas, and adjacent areas. In addition to Pasadena and South Pasadena, the Project site also passes through a portion of the City of Los Angeles. The survey area is located on the U.S. Geological Survey's (USGS') Pasadena and Los Angeles 7.5-minute quadrangles of the San Bernardino Meridian at Township 1 North, Range 12 West, Section 32 and Township 1 South, Range 12 West, Section 5.

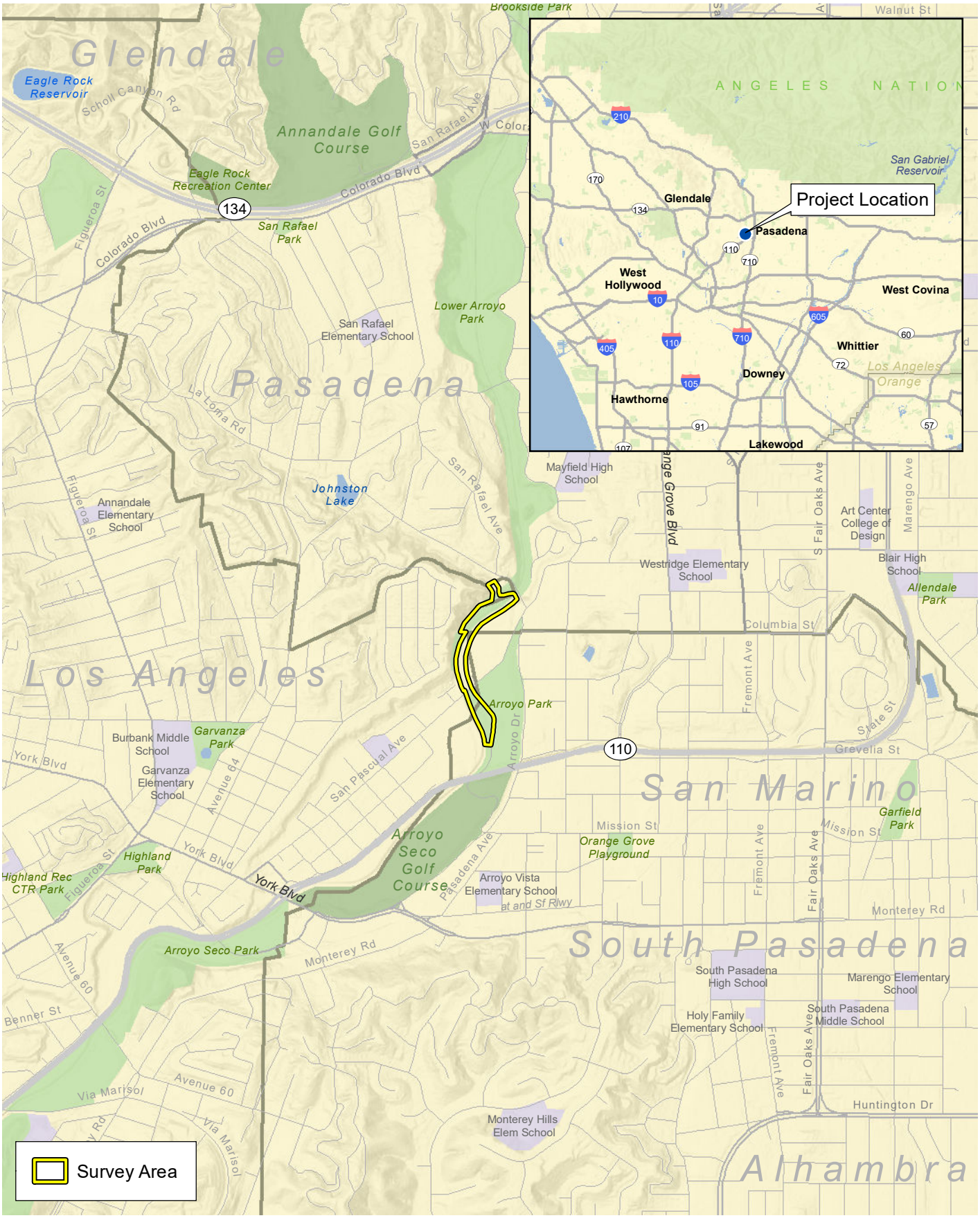
1.2 EXISTING CONDITIONS

The survey area is divided into three general sub-areas for ease of reference. These include: (1) the San Rafael Creek area at the northern end of the survey area (near the San Pasqual Stables equestrian center), which consists of a concrete-lined drain that conveys water from the Johnston Lake area and adjacent residential areas that are located northwest of the survey area and drains into the Arroyo Seco; (2) the Arroyo Seco Channel, along which a dirt equestrian trail runs along its easterly bank adjacent to the San Pascual Stables; and (3) the San Pascual Basin area, a densely vegetated basin that accepts flows diverted from the Arroyo Seco and is located at the northern end of Arroyo Park in the City of South Pasadena. These project sub-areas are shown in Exhibit 2.

1.3 PROJECT DESCRIPTION

The proposed Project involves the diversion of stormwater runoff from San Rafael Creek into treatment wetlands that would be created in an adjacent upland area. These treatment wetlands would improve water quality and allow for soil infiltration before discharging this treated water into the Arroyo Seco. Further downstream, water would be diverted from the Arroyo Seco to water treatment facilities and infiltration basins constructed in the approximate 2.5-acre San Pascual Basin site. A portion of the Arroyo Seco Channel that is located between the San Rafael Creek and San Pascual Basin areas was included in the survey to assess jurisdictional waters between the two Project areas that may be affected by Project implementation.

To provide access for construction vehicles to the San Rafael Creek area, a temporary concrete bridge will be built to span the Arroyo Seco Channel from the northwest corner of the San Pasqual Stables to the southern portion of the San Rafael Creek area. This temporary bridge is necessary to provide an access point that would accommodate the weight of all anticipated construction vehicles.



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Local Vicinity

Exhibit 1

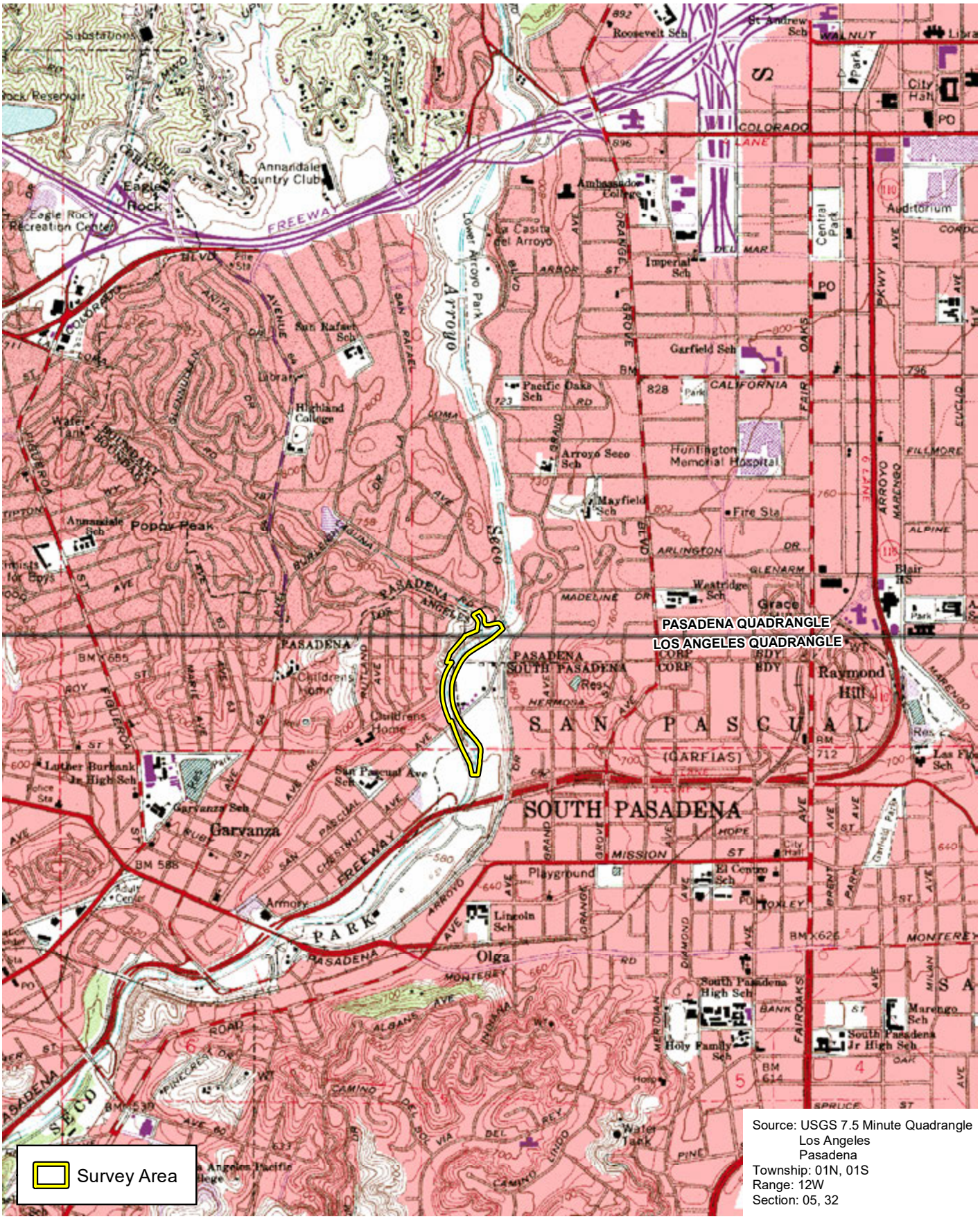
Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 2

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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Project Site

Exhibit 3

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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1.4 REGULATORY AUTHORITY

This section summarizes the federal and State agencies' regulatory jurisdiction over activities that have a potential to impact jurisdictional resources. A detailed explanation of each agency's regulatory authority is provided in Attachment A.

1.4.1 U.S. Army Corps of Engineers

The USACE Regulatory Branch regulates activities that discharge dredged or fill materials into "waters of the United States" (WOTUS) under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Its authority applies to all WOTUS where the material (1) replaces any portion of a WOTUS with dry land or (2) changes the bottom elevation of any portion of any WOTUS. Activities that result in fill or dredge of WOTUS require a permit from the USACE.

Recently, the definition of WOTUS has been the subject of shifting regulations. Recent federal revisions to regulations that address the extent of USACE jurisdiction and the definition of WOTUS have been issued by the Obama Administration in 2015 and the Trump Administration in 2020. On January 18, 2023, the United States Environmental Protection Agency (USEPA) published a final Water Rule in the Federal Register that took effect on March 20, 2023. To conform to the May 25, 2023 ruling by the U.S. Supreme Court (*Sackett v. EPA*), the USEPA issued a revised definition of WOTUS that was published in the Code of Federal Regulations (CFR) on September 8, 2023. The updated definition of WOTUS is provided in Title 40 §120.2(a) of the CFR and identifies federal jurisdiction under the CWA as:

1. Traditional Navigable Waters (TNWs), the territorial seas, and interstate non-wetland waters ("paragraph (a)(1) waters");
2. Impoundments of "waters of the United States" ("paragraph (a)(2) impoundments");
3. Tributaries to paragraph (a)(1) waters or (a)(2) impoundments when the tributaries are relatively permanent, standing or continuously flowing bodies of waters ("jurisdictional tributaries");
4. Wetlands that have a continuous surface connection to paragraph (a)(1) waters, or relatively permanent, standing or continuously flowing jurisdictional tributaries that have a continuous surface connection to paragraph (a)(1) waters; and
5. Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to paragraph (a)(1) waters or jurisdictional tributaries.

1.4.2 Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB), in conjunction with the nine RWQCBs, is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The SWRCB's and RWQCBs' jurisdictions extend to all "waters of the State" and to all WOTUS, including wetlands (isolated and non-isolated).

The Porter-Cologne Act broadly defines "waters of the State" as any surface water or groundwater, including saline waters, within the boundaries of the State." On August 28, 2019, the Office of Administrative Law approved the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to "waters of the State", which went into effect on May 28, 2020. Under these new regulations, the SWRCB and its nine RWQCBs will assert jurisdiction

over all existing WOTUS, and all waters that have been considered WOTUS under any historical definition.

Impacts to WOTUS are authorized by the RWQCBs through a Water Quality Certification per Section 401 of the CWA. Impacts to "waters of the State" that are not considered WOTUS would be authorized by Waste Discharge Requirements issued by the RWQCB, pursuant to California's Porter-Cologne Water Quality Control Act.

On April 6, 2022, the U.S. Supreme Court issued a stay of the October 2021 order by the U.S. District Court for the Northern District of California that vacated EPA's 2020 Clean Water Act Section 401 Certification Rule (2020). The stay of the vacatur applies nationwide. Therefore, the CWA section 401 certification process is once again governed by the CWA section 401 certification regulations promulgated by USEPA in 2020, codified at 40 CFR 121. This 2020 rule requires all project proponents to request a pre-filing meeting with the RWQCB at least 30 days prior to filing a 401 "Certification Request". The filing procedure has been simplified to require the filing of a "Certification Request", rather than the acceptance of a "complete application".

There is a mandatory 30-day wait period between a pre-filing meeting request and the filing of a Certification Request. A Certification Request must be filed with the RWQCB and the USACE concurrently. USACE reviews the Certification Request for the nine required components. The USACE has 15 days to review the Certification Request. The USACE then notifies the RWQCB that request is complete. And concurrently notifies the RWQCB of the reasonable time period to act on the Certification Request. The reasonable time period is not to exceed 1 year. Within 15 days of receipt of the Certification Request the RWQCB must provide the applicant with the following: 1) date of receipt; 2) applicable reasonable period of time to act on the Certification Request; and 3) date upon which waiver will occur if the certifying authority fails or refuses to act on the Certification Request. It should be noted that the RWQCB may require that the findings of the Jurisdictional Delineation Report be certified by the USACE prior to issuing a Section 401 Water Quality Certification.

Once the RWQCB issues the 401 Certification, the USACE has 5 days to notify the USEPA that the 401 Certification has been issued. The USEPA then has 30 days to notify neighboring jurisdictions of the 401 Certification. Neighboring jurisdictions have 60 days to respond. If there are no objections to the 401 Certification, then the USACE issues the 404 permit. It should be noted that the RWQCB may require that the findings of the Jurisdictional Delineation Report be certified by the USACE prior to issuing a Section 401 Water Quality Certification.

1.4.3 California Department of Fish and Wildlife

The CDFW regulates activities that may affect rivers, streams, and lakes pursuant to the *California Fish and Game Code* (§§1600–1616). According to Section 1602 of the *California Fish and Game Code,* the CDFW has jurisdictional authority over any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

2.0 METHODS

2.1 FIELD SURVEY

The analysis contained in this report uses the results of a field survey conducted by Psomas Regulatory Specialist David Hughes and Biologist Trevor Bristle on February 10, 2022. Jurisdictional features were delineated using a 1 inch equals 100 feet (1″ = 100′) scale aerial photograph. Jurisdictional drainage features were mapped as a line and the width of the agency jurisdiction was noted; other waterbodies (basins) were mapped as polygons.

Photographs that show conditions within the survey area are provided in Attachment B.

2.2 JURISDICTIONAL DELINEATION

2.2.1 Non-Wetlands

Non-wetland WOTUS are delineated based on the limits of the Ordinary High Water Mark (OHWM), which can be determined by a number of factors, including the presence of a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; and the presence of litter and debris. The OHWM limits (i.e., active floodplain) occurring in the survey area as based on methods contained in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*, *A Delineation Manual* (Lichvar and McColley 2008) and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010).

It should be noted that the RWQCB shares USACE jurisdiction unless a feature does not convey relatively permanent flows or if a feature is isolated and does not have a surface connection to a downstream TNW. If these conditions occur, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the three-parameter wetlands method pursuant to the 1987 Wetlands Manual. The CDFW's jurisdiction is defined as the top of the bank on either side of a stream, channel, or basin or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, lake, or other impoundment.

For hardened channels such as the Arroyo Seco and San Rafael Creek, the width of the OHWM is determined by the extent of the flat bottom section of the channel. The CDFW will assert jurisdiction to the top of the banks of these channels, which is equal to the OHWM width for channels with vertical sidewalls.

2.2.2 Wetlands

The three-parameter approach is used to identify USACE wetlands based on the procedure described by the USACE in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). The presence of wetlands is determined by the presence of indicators that provide evidence of the presence of (1) wetland hydrology, (2) hydrophytic vegetation, and (3) hydric soils. These criteria are described in more detailed in this section.

Vegetation

Hydrophytic vegetation (or hydrophytes) is defined as any macrophytic plant that "grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats" (Environmental Laboratory 1987). Specifically,

these plant species have specialized morphological, physiological, or other adaptations for surviving in permanently saturated to periodically saturated soils where oxygen levels are very low or the soils are anaerobic. Lichvar and Gillrich (2011) provide the following technical definitions of wetland plant indicator status categories:

- **Obligate Wetland (OBL):** These wetland-dependent plants (herbaceous or woody) require standing water or seasonally saturated soils (14 or more consecutive days) near the surface to assure adequate growth, development, and reproduction and to maintain healthy populations.
- **Facultative Wetlands (FACW):** These plants depend on and predominantly occur with hydric soils, standing water, or seasonally high water tables in wet habitats for assuring optimal growth, development, and reproduction and for maintaining healthy populations. These plants often grow in geomorphic locations where water saturates soils or floods the soil surface at least seasonally.
- **Facultative (FAC):** These plants can occur in wetlands or non-wetlands. They can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology (e.g., shade tolerance, soil hydrogen potential [pH], and elevation) and they have a wide tolerance of soil moisture conditions.
- **Facultative Upland (FACU):** These plants are not wetland dependent. They can grow on hydric and seasonally saturated soils, but they develop optimal growth and healthy populations on predominantly drier or more mesic sites. Unlike FAC plants, these plants are non-wetland plants by habitat preference.
- **Upland (UPL):** These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.

The USACE—as part of an interagency effort with the U.S. Environmental Protection Agency (USEPA), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Department of Agriculture's Natural Resources Conservation Service (USDA NRCS)—has approved a National Wetland Plant List (NWPL) that provides the current indicator status for plant species. The NWPL is used to determine whether the hydrophytic vegetation parameter is met when conducting wetland determinations under the CWA. The NWPL is also intended to be used for wetland restoration, establishment, and enhancement projects. This report utilized the indicator statuses for the Arid West Supplement portion of the NWPL.

The following are three procedures for determining hydrophytic vegetation: Indicator 1, "Dominance Test", using the "50/20 Rule"; Indicator 2, "Prevalence Index"; or Indicator 3, "Morphological Adaptation", as identified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). Hydrophytic vegetation is present if any indicator is satisfied. If none of the indicators are satisfied, then hydrophytic vegetation is absent unless (1) indicators of hydric soil and wetland hydrology are present and (2) the site meets the requirements for a problematic wetland situation.

Dominance Test: Vegetative cover is estimated and is ranked according to its dominance. Dominant species are the most abundant species for each stratum of the community (i.e., tree, sapling/shrub, herb, or woody vine) that individually or collectively amount to 50 percent of the total coverage of vegetation plus any other species that, by itself, accounts for 20 percent of the total vegetation cover (also known as the "50/20 Rule"). These species are recorded on the "Wetland Determination Data Form – Arid West Region". The wetlands indicator status of each species is also recorded on the data forms based on the *National List of Plant Species that Occur*

in Wetlands (Reed 1988). If greater than 50 percent of the dominant species across all strata are OBL, FACW, or FAC species, the criterion for wetland vegetation is considered to be met.

Prevalence Index: The prevalence index considers all plant species in a community, not just the dominant ones. The prevalence index is the average of the wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and is weighted by the species' abundance (percent cover). Hydrophytic vegetation is present if the prevalence index is 3.0 or less.

Morphological Adaptation: Morphological adaptations, such as adventitious roots (i.e., roots that take advantage of the wet conditions) and shallow root systems must be observed on more than 50 percent of the individuals of a FACU species for the hydrophytic vegetation wetland criterion to be met.

Soils

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that is formed under conditions of saturation, flooding, or ponding that occurs long enough during the growing season to develop anaerobic conditions (or conditions of limited oxygen) at or near the soil surface and that favor the establishment of hydrophytic vegetation (USDA NRCS 2017a). It should be noted that hydric soils created under artificial conditions of flooding and inundation sufficient for the establishment of hydrophytic vegetation would also meet this hydric soil indicator.

The soil conditions are verified by digging test pits along each transect to a typical depth of at least 20 inches (except where a restrictive layer occurs in areas containing hard pan, cobble, or solid rock). Soil test pit locations are usually dug within the drainage invert or at the edge of a drainage course in vegetated areas. Soil extracted from each soil test pit is then examined for texture and color using the standard plates within the Munsell Soil Color Chart (1994) and recorded on the Data Form. The Munsell Soil Color Chart aids in designating soils by color labels based on gradations of three simple variables: hue, value, and chroma. Any indicators of hydric soils such as redoximorphic features (i.e., areas where iron is reduced under anaerobic conditions and oxidized following a return to aerobic conditions); buried organic matter; organic streaking; reduced soil conditions; gleyed (i.e., soils having a characteristic bluish-gray or greenish-gray in color) or low-chroma soils; or sulfuric odor are also recorded on the Data Form. If hydric soils are found, progressive pits are dug along the transect moving laterally away from the active channel area until hydric soil features are no longer present within the top 20 inches of the soil.

Hydrology

Wetlands hydrology is represented by either (1) all of the hydrological elements or characteristics of areas permanently or periodically inundated or (2) areas containing soils that are saturated for a sufficient duration of time to create hydric soils suitable for the establishment of plant species that are typically adapted to anaerobic soil conditions. The presence of wetland hydrology is evaluated at each intersect by recording the extent of observed surface flows, the depth of inundation, the depth to saturated soils, and the depth to free water in soil test pits. In instances where stream flow is divided into multiple channels with intervening sandbars, the entire area between the channels is considered within the OHWM. Therefore, an area containing these features would meet the indicator requirements for wetland hydrology.

3.0 LITERATURE REVIEW

This section provides a summary of literature that was reviewed prior to the field survey and during report preparation that have helped inform the analysis provided in this report. Prior to conducting the delineation and during the course of report preparation, Psomas reviewed the following documents to identify areas that may fall under agency jurisdiction: the USGS' Pasadena and Los Angeles 7.5-minute topographic quadrangle maps; color aerial photography provided by Google Earth; soil data provided by the U.S. Department of Agriculture's Natural Resources Conservation Service (USDA NRCS 2022a); the National Hydric Soils List (USDA NRCS 2022b); the National Wetlands Inventory's Wetland Mapper (USFWS 2022); and the Water Quality Control Plan for the Los Angeles Region (Los Angeles RWQCB 1994). The results of this literature review are provided below.

3.1 USGS TOPOGRAPHIC QUADRANGLE

The USGS topographic quadrangle maps show geological formations and their characteristics; they describe the physical settings of an area through topographic contour lines and other major surface features. These features include lakes, streams, rivers, buildings, roadways, landmarks, and other features that may fall under the jurisdiction of one or more regulatory agencies. In addition, the USGS maps provide topographic information that is useful in determining elevations, latitude and longitude, and Universal Transverse Mercator (UTM) Grid coordinates.

The survey area occurs on the USGS' Pasadena and Los Angeles 7.5-minute topographic quadrangle map. The Arroyo Seco appears as a blueline stream, but no other drainage features that occur within the Project boundary are shown on the quadrangle map. Elevation in the Project boundary ranges from approximately 600 to 650 feet above mean sea level.

3.2 SOIL SURVEY

The presence of hydric soils is one of the chief indicators of jurisdictional wetlands. Psomas reviewed the USDA's soil data for areas within the Project boundary (Exhibit 4). The Project boundary contains the following soil types: Urban land-Xerorthents-Osito complex, 10 to 35 percent slopes, Urban land, frequently flooded, 0 to 5 percent slopes, and Soboba and Tujunga soils, 0 to 5 percent slopes, frequently flooded.

The National Hydric Soils List identifies a soil map unit as "hydric" if it contains either a major or minor component that is at least in part hydric (USDA NRCS 2022c). The survey area occurs in the Los Angeles County, Southeastern Soil Survey Area. None of the soil types listed above that occur in the Project boundary are listed on the National Hydric Soils List. A brief description of these soils is provided in Attachment C of this report.

3.3 NATIONAL WETLANDS INVENTORY

The U.S. Fish and Wildlife Service's Wetland Mapper (USFWS 2022) shows wetland resources available from the Wetlands Spatial Data Layer of the National Spatial Data Infrastructure. This resource provides the classification of known wetlands following the Classification of Wetlands and Deepwater Habitats of the United States (FGDC 2013). This classification system is arranged in a hierarchy of (1) Systems that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors (i.e., Marine Estuarine, Riverine, Lacustrine, and Palustrine); (2) Subsystems (i.e., Subtidal and Intertidal; Tidal, Lower Perennial, Upper Perennial, and Intermittent; or Littoral and Limnetic); (3) Classes, which are based on substrate material and flooding regime or on vegetative life forms; (4) Subclasses; and (5) Dominance Types, which are named for the dominant plant or wildlife forms. In addition, there are modifying terms applied to Classes or Subclasses.



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Soil Map

Exhibit 4

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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Three jurisdictional features occur in the Project boundary, including the Arroyo Seco; San Rafael Creek which drains into the Arroyo Seco; and the San Pascual Basin at the downstream end of the Project area (Exhibit 5). The Arroyo Seco Channel is shown as R4SBAx (Riverine, Intermittent Streambed, Seasonally Flooded, Excavated). San Rafael Creek is shown as PSSA (Palustrine, Scrub-Shrub, Temporary Flooded). San Pascual Basin contains two descriptions: PFOCh (Palustrine, Forested, Seasonally Flooded, Impounded) and Rp1FO (Riparian, Lotic, Forested).

A complete description of the wetland classifications that describe these resources is provided in Attachment C.

3.4 REGIONAL WATER QUALITY CONTROL PLAN

There are nine Regional Water Quality Control Boards in California. The survey area is located within Regional Water Quality Control Board Region 4, the Los Angeles Region. The SWRCB and the Los Angeles RWQCB have adopted a Water Quality Control Plan (or "Basin Plan") for the Los Angeles Region. The Basin Plan contains goals and policies, descriptions of conditions, and proposed solutions to surface and groundwater issues. The Basin Plan also establishes water quality standards for surface and groundwater resources and includes beneficial uses and levels of water quality that must be met and maintained to protect these uses. These water quality standards are implemented through various regulatory permits pursuant to CWA Section 401 for Water Quality Certifications and Section 402 for Report of Waste Discharge permits.

The portion of the Arroyo Seco that passes through the project site is identified by the RWQCB in the Basin Plan as Arroyo Seco Reach 1 (Watershed Boundary Dataset [WBD] 180701050209) (Los Angeles RWQCB 1994). San Rafael Creek and the San Pascual Basin are associated with Arroyo Seco Reach 1 and the Beneficial Uses identified for the Arroyo Seco would apply to these other features in the survey area as well.

Potential Beneficial Uses for Arroyo Seco Reach 1 are summarized in Table 1 and include: Municipal Water Supply (MUN); Warm Freshwater Habitat (WARM); and Wildlife Habitat (WILD). Intermittent Beneficial Uses include Limited Water Contact Recreation (REC1); and Non-Contact Water Recreation (REC2).

TABLE 1
SUMMARY OF BENEFICIAL USES

WBD	Beneficial Uses				
	MUN	WARM	WILD	REC1	REC2
180701050209 Arroyo Seco Reach 1	P	P	P	P	I

WBD: Watershed Boundary Dataset; I: Intermittent Beneficial Use; P: Potential Beneficial Use

MUN: Municipal Water Supply; WARM: Warm Freshwater Habitat; WILD: Wildlife Habitat; REC1: Limited Water Contact Recreation; REC2: Non-Contact Water Recreation

Source: Los Angeles RWQCB 1994.

Descriptions of the various Beneficial Uses are provided in Attachment C.



Data Source: U.S. Fish & Wildlife Service; National Wetlands Inventory December 2016
Aerial Source: Esri, Maxar 2022

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National Wetland Inventory

Exhibit 5

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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4.0 JURISDICTIONAL ANALYSIS

The survey area contains three distinct but connected jurisdictional features: (1) San Rafael Creek; (2) Arroyo Seco Channel; and (3) the San Pascual Basin. As described previously in this report, San Rafael Creek is a concrete-lined drainage that conveys water from Johnston Lake area (which lies approximately ½-mile northwest of the survey area) as well as runoff from surrounding residential areas. This channel drains directly into the Arroyo Seco at the northern end of the survey area. The Arroyo Seco is a wider, concrete-lined channel with vertical walls that flows from north to south through the survey area. Midway through the survey area, a weir diverts water from the low-flow portion of the Arroyo Seco into the San Pascual Basin via an underground culvert. Water is confined at the southern end of the basin, though water can overflow the wall that defines the lower end of the basin and drain back to the Arroyo Seco.

A summary of jurisdictional resources in the survey area is provided in Table 2 and photographs are provided in Attachment B that illustrate the general conditions in the survey area.

TABLE 2
SUMMARY OF JURISDICTIONAL RESOURCES IN THE SURVEY AREA

Survey Area	Latitude/Longitude (decimal degrees)		Feature Length (linear feet)	OHWM Width Range (feet)	USACE Jurisdiction (acres)		RWQCB Jurisdiction (acres)		CDFW Jurisdiction (acres)
	Upstream End	Downstream End			Wetland	Non-wetland	Wetland	Non-Wetland	
San Rafael Creek	34.125844°, -118.166938°	34.124887°, -118.166877°	405	6–10	0.000	0.098	0.00	0.098	0.098
Arroyo Seco Channel	34.125528°, -118.166729°	34.119197°, -118.167141°	2,730	40–50	0.000	2.604	0.00	2.604	3.018
San Pascual Basin	34.121016°, -118.167599°	34.119819°, -118.167001°	580	5–36	0.064	0.219	0.064	0.221	1.798
Total					**0.064**	**2.921**	**0.064**	**2.923**	**4.914**

OHWM: Ordinary High Water Mark; USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife

4.1 "WATERS OF THE UNITED STATES" DETERMINATION

As discussed in Section 1.4, the federal government recently put forth a final Water Rule that contains an updated definition of WOTUS. This WOTUS definition covers features that have been consistently regulated by the Clean Water Act such as TNWs, the territorial seas, interstate waters, and any impoundments of these waters. Pertinent to this analysis, WOTUS also consist of "jurisdictional tributaries", which are drainage features that meet either the relatively permanent standard or the significant nexus standard.

4.1.1 Significant Nexus Standard

San Rafael Creek drains directly into the Arroyo Seco which conveys water from north to south through the Project boundary and travels approximately five miles before draining into the Los Angeles River, a Traditional Navigable Waterway (TNW)[1]. The San Pascual Basin receives water via an underground culvert directly from Arroyo Seco and is designed to discharge water back to

[1] Traditional Navigable Waters are "all waters that are currently used, or 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" (33 CFR 328.3).

the Arroyo Seco. Due to the direct connection that these areas have to a TNW, they are all determined to meet the Significant Nexus Standard.

4.1.2 Relatively Permanent Standard

Given the presence of surface water during the field visit and multiple seasons of aerial imagery showing surface water, the Arroyo Seco Channel, San Rafael Creek, and the San Pascual Basin are considered to have relatively permanent flow. As a result, these areas are determined to meet the Relatively Permanent Standard.

4.1.3 Limits of "Waters of the U.S."

The USACE asserts jurisdiction over non-navigable tributaries of TNWs that have relatively permanent flows and/or have a direct hydrological connection to a TNW. Therefore, the Arroyo Seco Channel, San Rafael Creek, and San Pascual Basin would be under the regulatory authority of the USACE.

In San Rafael Creek and the Arroyo Seco, the limits of non-wetland WOTUS were defined by the width of the flat bottom of the concrete channels. Within the San Pascual Basin, the limits of WOTUS were based on the presence of a well-established bed and bank. The basin is fed by a diversion structure that provides a steady supply of water to the area but is not subject to seasonal high flows that would scour the streambed as would occur in a natural stream. Approximately 2.921 acres of non-wetland "waters of the U.S." under the regulatory authority of the USACE occur within the survey area (Table 2; Exhibit 6).

4.1.4 Wetlands Determination

Three sampling points were assessed for the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. Sampling points were located within the San Pascual Basin as it was the only portion of the survey area that contained an earthen-bottom drainage feature (Table 3). Wetland determination data forms that document conditions at each sampling point are provided in Attachment D, while a summary of observations is provided below.

TABLE 3
SUMMARY OF SAMPLING POINT DATA

Sampling Point	Vegetated	Dominance Test Result*	Prevalence Index Result	Hydrophytic Vegetation Present	Hydric Soil Indicators	Wetland Hydrology Indicators	Wetland?
1	Yes	20%	4.5	No	None	A1	No
2	Yes	33%	3.9	No	None	A1	No
3	Yes	100%	2.1	Yes	A9	A1	Yes

* Percent of dominant species that are OBL, FACW, or FAC.

Hydric Soil Indicators		Wetland Hydrology Indicators	
A9	1cm muck	A1	Surface Water

Vegetation

Vegetation was assessed in representative areas at or below the OHWM. Areas with less than five percent vegetation were considered unvegetated and so did not meet the hydrophytic vegetation criterion. Sampling Points 1 and 2 were dominated by UPL and FAC tree species such as coast live oak (*Quercus agrifolia*), western sycamore (*Platanus racemosa*), and shamel ash (*Fraxinus uhdei*) with a generally sparse understory except for dense patches of California blackberry (*Rubus ursinus*). Vegetation conditions were different at Sampling Point 3 near the downstream end of survey area. In this area, water ponds due to the concrete wall that separates the basin from the Arroyo Seco Channel. Due to this perennial source of water, the vegetation is dominated by OBL and FACW species such as cattails (*Typha* sp.), tall umbrella plant (*Cyperus eragrostis*), and black willow (*Salix gooddingii*). Therefore, the hydrophytic vegetation criterion was met only at Sampling Point 3.

Soils

Soil test pits were dug in representative areas containing at least five percent vegetation at or below the OHWM. Soils in the channel were generally sandy, though the percentage of partially decomposed organic matter in the soil increased toward the southern end of the site. sandy. Sampling Point 3 contained a thin layer of muck that was more than one centimeter thick. As a result, the hydric soil criterion was met only at Sampling Point 3.

Hydrology

As described above, the San Pascual Basin is fed by a diversion structure in the Arroyo Seco Channel that provides an ongoing (possibly perennial) source of water. Surface water was present at all three sampling points. Therefore, the wetland hydrology criterion was met at all three sampling points.

Results

Only Sampling Point 3, at the downstream end of the San Pascual Basin, exhibited all three criteria for wetland “waters of the U.S.”. The extent of similar soil and vegetation conditions in the downstream end of the basin was determined and mapped as a wetland feature. This wetland area measures 0.064 acre.

4.2 REGIONAL WATER QUALITY CONTROL BOARD JURISDICTION

All of features described in this report that are subject to USACE jurisdiction are also considered “waters of the State” under the jurisdiction of the RWQCB. There is one small feature in the San Pascual Basin that is “waters of the State” but is not considered WOTUS. This feature is a narrow drainage at the outlet of an apparent storm drain that is draining water from the upland park area and streets that are east of the basin. This feature is not considered WOTUS because it is directing water from upland areas and is not the result of converting a natural streambed. The definition of “waters of the State” is broader than WOTUS, so that this feature is considered jurisdictional by the RWQCB.

Therefore, the survey area contains 0.064 acre of wetlands and 2.923 acres of non-wetland “waters of the State” (Table 2; Exhibit 6). Waters within San Pascual Basin would be considered vegetated “waters of the State”, while those within San Rafael Creek and the Arroyo Seco Channel would be considered unvegetated waters.



Aerial Source: Esri, Maxar 2022

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Jurisdictional Resources

Exhibit 6

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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4.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE JURISDICTION

The CDFW's jurisdictional limits for the vertical-wall concrete channels (San Rafael Creek and Arroyo Seco Channel) are generally the same as the other resource agencies. The only difference is that two coast live oaks that overhang the Arroyo Seco along its eastern side would also fall under the CDFW's jurisdiction.

The CDFW's jurisdiction in the San Pascual Basin extends to the top of the bank which would encompass the entire basin. All native trees within the basin would also be subject to CDFW jurisdiction. In all, the total amount of CDFW's jurisdiction in the survey area is 4.914 acres (Table 2; Exhibit 6).

5.0 IMPACT ANALYSIS

As described in Section 1.3, impacts from implementation of the Project would result from modifying the side wall and channel bottom of San Rafael Creek to divert water into water treatment wetlands in areas that are currently uplands. Most Project-related impacts will occur in San Pascual Basin, which would be regraded to accommodate proposed facilities to treat water diverted from the Arroyo Seco Channel for subsequent re-use. The anticipated Project impacts to jurisdictional resources are discussed below in terms of each regulatory agency's requirements and are shown on Exhibits 7a and 7b.

5.1 U.S. ARMY CORPS OF ENGINEERS

Impacts to USACE WOTUS would result from creating a diversion structure within San Rafael Creek. This would be a permanent impact to WOTUS, though it would not affect flows to downstream waters other than to improve the quality of the water flowing into the Arroyo Seco. Permanent impacts to WOTUS would occur in San Pascual Basin from grading activities and vegetation removal to accommodate the proposed water treatment facilities in the basin.

No impacts to WOTUS would occur from construction of the temporary construction bridge at the San Rafael Creek area as the bridge will be built to completely span the Arroyo Seco without affecting the channel bottom or sidewalls.

A summary of Project impacts related to WOTUS is provided in Table 4.

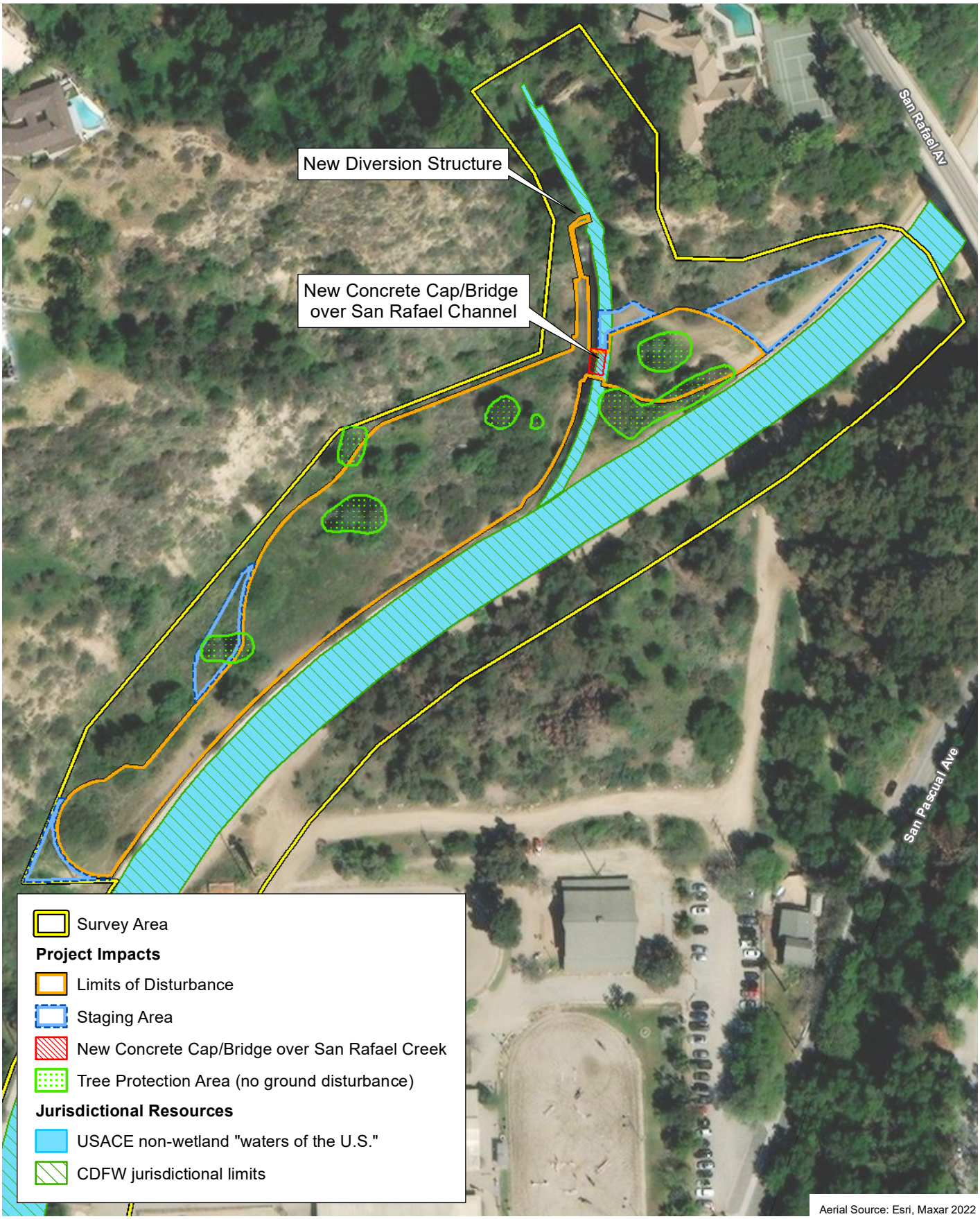
TABLE 4
SUMMARY OF PROPOSED IMPACTS TO "WATERS OF THE U.S."

Agency	Impact Type	Impacts (acres)			Total
		San Rafael Creek	Arroyo Seco Channel	San Pascual Basin	
Wetlands					
USACE	Existing	0.000	0.000	0.064	**0.064**
	Permanent	0.000	0.000	0.064	**0.064**
	Temporary	0.000	0.000	0.000	**0.000**
Non-wetland waters					
USACE	Existing	0.098	2.604	0.219	**2.921**
	Permanent	0.001	0.000	0.219	**0.220**
	Temporary	0.000	0.000	0.000	**0.000**
USACE: U.S. Army Corps of Engineers					

5.2 REGIONAL WATER QUALITY CONTROL BOARD

Impacts to RWQCB "waters of the State" largely mirror those of WOTUS. The construction of a diversion structure is considered a permanent impact to the unvegetated concrete-lined San Rafael Creek (0.001 acre). The Project proposes a concrete cap or bridge over San Rafael Creek. While the USACE regulates only discharges to jurisdictional waterways, the RWQCB may consider the installation of structures that cover channels (such as a concrete bridge) to be a permanent (though indirect) impact because it may have an impact on water quality. This aspect of the Project would result in an impact of 0.007 acre.

The construction of a free span access bridge across the Arroyo Seco to the San Rafael Creek area is not considered herein to be an impact on "waters of the State" due to the temporary nature



Aerial Source: Esri, Maxar 2022

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Impacts to Jurisdictional Waters – San Rafael Creek Area

Exhibit 7a

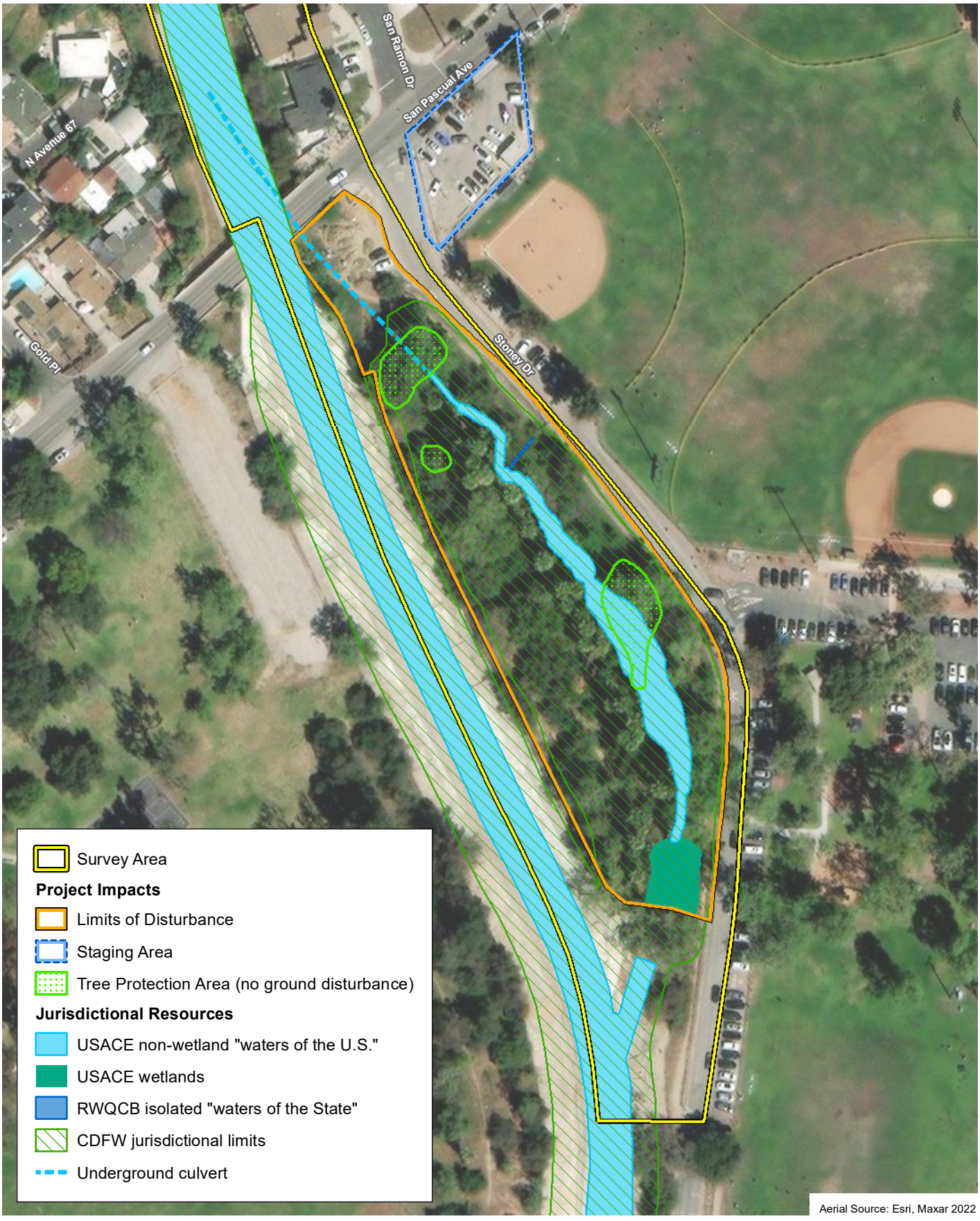
Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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Aerial Source: Esri, Maxar 2022

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Impacts to Jurisdictional Waters – San Pascual Basin Area

Exhibit 7b

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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of the access bridge (the bridge will be in place for approximately nine months) and because the bridge will be built to completely span the Arroyo Seco without affecting the channel bottom or sidewalls.

Impacts to jurisdictional "waters of the State" slightly exceed those of WOTUS in the San Pascual Basin because the basin includes a side channel that drains adjacent upland areas. This side channel is not considered WOTUS but still falls under the jurisdiction of the Los Angeles RWQCB as an isolated feature. A summary of Project impacts related to "waters of the State" under the jurisdiction of the Los Angeles RWQCB is provided in Table 5.

TABLE 5
SUMMARY OF PROPOSED IMPACTS TO
LOS ANGELES RWQCB "WATERS OF THE STATE"

Agency	Impact Type	Impacts (acres)			Total
		San Rafael Creek	Arroyo Seco Channel	San Pascual Basin	
Wetlands					
RWQCB	Existing	0.000	0.000	0.064	**0.064**
	Permanent	0.000	0.000	0.064	**0.064**
	Temporary	0.000	0.000	0.000	**0.000**
Non-wetland Waters					
RWQCB	Existing	0.098	2.604	0.221	**2.923**
	Permanent	0.008	0.000	0.221	**0.229**
	Temporary	0.000	0.000	0.000	**0.000**
RWQCB: Regional Water Quality Control Board					

5.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Impacts to CDFW jurisdictional waters would result from modifications to San Rafael Creek for the creation of the diversion structure to allow water to reach the proposed treatment wetlands. The proposed construction of the concrete cap/bridge over San Rafael Creek would likely not be considered as an impact by the CDFW because there is no aquatic habitat in the concrete channel to be affected.

Similarly, the proposed installation of a temporary concrete bridge spanning the Arroyo Seco Channel during the approximate nine-month construction period is not expected to be considered an impact to CDFW jurisdictional streambed due to the lack of aquatic habitat in the concrete channel that would potentially be shaded by the bridge.

Grading in the San Pascual Basin area would result in an impact to 1.617 acres of CDFW jurisdictional area. Furthermore, this grading would result in the removal of 41 trees, including 12 western sycamores (*Platanus racemosa*), 18 coast live oaks (*Quercus agrifolia*), 8 black willows (*Salix gooddingii*), and 3 arroyo willows (*Salix lasiolepis*). Additional removals would include5 toyons (*Heteromeles arbutifolia*), and 15 blue elderberries (*Sambucus nigra* ssp. *caerulea*), though the CDFW may not assert jurisdiction over these species which are typically considered large shrubs rather than trees. A summary of Project impacts to CDFW jurisdictional areas is provided in Table 6.

TABLE 6
SUMMARY OF PROPOSED IMPACTS TO CDFW JURISDICTIONAL WATERS

Agency	Impact Type	Impacts per Project Area (acres)			Total
		San Rafael Creek	Arroyo Seco	San Pascual Basin	
CDFW	Existing	0.098	3.018	1.798	**4.914**
	Permanent	0.001	0.000	1.617	**1.618**
	Temporary	0.000	0.000	0.000	**0.000**
CDFW: California Department of Fish and Wildlife					

6.0 REGULATORY APPROVAL PROCESS

This section summarizes the various permits, agreements, and certifications that may be required prior to initiation of the Project construction activities that involve impacts to jurisdictional waters, including:

- USACE Section 404 Permit;
- RWQCB Section 401 Water Quality Certification; and
- CDFW Section 1602 Notification of Lake or Streambed Alteration.

It should be noted that all regulatory permit applications can be processed concurrently.

6.1 U.S. ARMY CORPS OF ENGINEERS

Prior to construction in WOTUS, a Section 404 permit from the USACE is required. Regulatory authorization in the form of a Nationwide Permit (NWP) or regional permit is provided for certain categories of activities. If the NWP conditions cannot be met, an Individual Permit (IP) is required.

The proposed Project would likely fall under NWP 59 (Water Reclamation and Reuse Facilities), which authorizes discharges into non-tidal WOTUS for the construction and maintenance of water reclamation and reuse facilities including vegetation areas and constructed wetlands to improve water quality.

Issuance of the USACE Section 404 permit would be contingent upon the approval of a Section 401 Water Quality Certification from the Los Angeles RWQCB, which is discussed below.

6.2 REGIONAL WATER QUALITY CONTROL BOARD

As noted above, issuance of the USACE Section 404 permit would be contingent upon the approval of a Section 401 Water Quality Certification from the Los Angeles RWQCB. The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications. The notification/application for a CWA Section 401 Water Quality Certification must also address compliance with the Basin Plan. Please note that the application would also require the payment of an application fee, which would be based on Project impacts.

The RWQCB requires certification of the proposed project's California Environmental Quality Act (CEQA) documentation before it will approve the Section 401 Water Quality Certification. The RWQCB, as a responsible agency, would use the proposed Project's CEQA document to satisfy its own CEQA-compliance requirements.

6.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Prior to construction, Notification of a Lake or Streambed Alteration (LSA) must be submitted to the CDFW that describes any proposed streambed alteration contemplated by the proposed Project. If an LSA Agreement is required, the CDFW may want to conduct an on-site inspection.

In addition to the formal application materials and the fee, a copy of the appropriate environmental document (in this case, an Initial Study/Mitigated Negative Declaration) must be included in the submittal, consistent with CEQA requirements. The CDFW will not deem the application to be complete until the application fees have been paid and the agency is provided with a certified

CEQA document and a signed copy of the receipt of County Clerk filing fees for the Notice of Determination (NOD).

6.4 RECOMMENDATIONS

Based on the conclusions of this Jurisdictional Delineation Report, the following recommendations are identified:

1. A pre-application meeting should be scheduled with USACE, CDFW, and RWQCB staff to discuss site conditions; the proposed Project; biological and jurisdictional resources and impacts to these resources resulting from the proposed Project; proposed minimization measures and the mitigation program to offset these impacts; and the regulatory permit process.
2. The following should be prepared and processed: a USACE Section 404 Permit; an RWQCB Section 401 Water Quality Certification; a CDFW Section 1602 Notification of LSA; and the appropriate jurisdictional determination form approved by the USACE.

7.0 REFERENCES

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ATTACHMENT A

SUMMARY OF REGULATORY AUTHORITY

REGULATORY AUTHORITY

This attachment summarizes the regulatory authority of the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW) over activities that have potential to impact jurisdictional resources.

U.S. Army Corps of Engineers

The USACE Regulatory Branch regulates activities that discharge dredged or fill materials into "waters of the United States" (WOTUS) under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. This permitting authority applies to all WOTUS where the material (1) replaces any portion of WOTUS with dry land or (2) changes the bottom elevation of any portion of any WOTUS. These fill materials would include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in these waters.

Waters of the United States

Regulations surrounding WOTUS have undergone several revisions over the past several years, including new Water Rules put forth by the Obama Administration in 2015 and the Trump Administration in 2020, which was vacated by the U.S. District Court for the District of Arizona in August 2021. Most recently, the United States Environmental Protection Agency (USEPA) and the USACE published a new Water Rule in the *Federal Register* on January 18, 2023 which became effective on March 20, 2023.

On May 25, 2023, the U.S. Supreme Court overruled the USEPA's interpretation of the CWA pursuant to the definition of WOTUS in the case of *Sackett v. U.S. Environmental Protection Agency*. To conform to the Supreme Court decision, the USEPA issued a revised definition of WOTUS that was published in the Code of Federal Regulations on September 8, 2023.

The current definition of WOTUS includes:

1. Waters which are:
   (i) Currently used, or 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;
   (ii) The territorial seas; or
   (iii) Interstate waters
2. Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph 5 of this section;
3. Tributaries of waters identified in paragraphs 1 or 2 that are relatively permanent, standing or continuously flowing bodies of water;
4. Wetlands adjacent to the following waters:
   (i) Waters identified in paragraph 1; or
   (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph 2 or 3 and with a continuous surface connection to those waters.
5. Intrastate lakes and ponds not identified in paragraphs 1 through 4
   (i) That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraphs 1 or 3.

The regulatory text for this rule specifically identifies several features that are non-jurisdictional by definition. These include:

- waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;
- prior converted cropland designated by the Secretary of Agriculture;
- ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;
- artificially irrigated areas that would revert to dry land if the irrigation ceased;
- artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
- artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;
- waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of WOTUS; and
- swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

Ordinary High Water Mark

The landward limit of tidal "waters of the U.S." is the high-tide line. In non-tidal waters where adjacent wetlands are absent, the lateral limits of USACE jurisdiction extend to the ordinary high water mark (OHWM).[1] The OHWM is defined as "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 the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas".[2] When wetlands are present, the lateral limits of USACE jurisdiction extend beyond the OHWM to the limits of the adjacent wetlands.[3]

Wetlands

A wetland is a subset of jurisdictional waters and is defined by the USACE and the USEPA as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions".[4] Wetlands generally include swamps, marshes, bogs, and areas containing similar features.

The definition and methods for identifying wetland resources can be found in the USACE's *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*,[5]

1 U.S. Army Corps of Engineers (USACE). 2005 (December 7). Regulatory Guidance Letter. Ordinary High Water Mark Identification. Washington, D.C.: USACE.
2 *Code of Federal Regulations* (CFR), Title 33, §328.3(e)
3 USACE 2005
4 33 CFR §328.3(b)
5 USACE. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

a supplement to the 1987 *Corps of Engineers Wetlands Delineation Manual*.[6] Both the 1987 Wetlands Manual and the 2008 Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of wetland "waters of the U.S.". Pursuant to these manuals, a three-parameter approach is used to identify wetlands and requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils. In order to be considered a wetland, an area must exhibit one or more indicators of all three of these parameters. However, problem areas may periodically or permanently lack certain indicators for reasons such as seasonal or annual variability of rainfall, vegetation, and other factors. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement.

Section 404 Permit

Except as specified in Section 323.4 of the CFR, impacts to "waters of the U.S." require a Section 404 Permit. Permit authorization may be in the form of (1) a "general permit" authorizing a category of activities in a specific geographical region or nationwide or (2) an "individual permit" (IP) following a review of an individual application form (to be obtained from the district office having jurisdiction over the waters in which the activity is proposed to be located).

Regulatory authorization in the form of a Nationwide Permit (NWP) is provided for certain categories of activities such as repair, rehabilitation, or replacement of a structure or fill which was previously authorized; utility line placement; or bank stabilization. NWPs authorize only those activities with minimal adverse effects on the aquatic environment and are valid only if the conditions applicable to the permits are met or waivers to these conditions are provided in writing from the USACE. Please note that waivers may require consultation with affected federal and State agencies, which can be a lengthy process with no mandated processing time frames. Certain activities do not require submission of an application form but may require a separate notification. If the NWP conditions cannot be met, an IP would be required. "Waters of the U.S." temporarily filled, flooded, excavated, or drained but restored to pre-construction contours and elevations after construction are not included in the measurement of loss of "waters of the U.S.". The appropriate permit authorization would be based on the amount of impacts to "waters of the U.S.", as determined by the USACE. There is no filing fee for the Section 404 Permit.

Approximately three or four months are typically required to process a routine permit application; large or complex activities may take longer to process. When a permit application is received, it would be assigned an identification number and reviewed for completeness by the District Engineer. If an application is incomplete, additional information will be requested within 15 days of receipt of the application. If an application is complete, the District Engineer will issue a public notice within 15 days unless specifically exempted by provisions of the CFR. Public comments will be accepted no more than 30 days but not less than 15 days from the date of public notice; these will become part of the administrative record of the application. Generally, the District Engineer will decide on the application no later than 60 days after receipt of the completed application. Additional permit situations may increase the permit processing time (e.g., projects involving a Section 401 Water Quality Certification, a coastal zone management consistency analysis, historic properties, a federal agency, and/or Endangered species). The Project Applicant will be given time, not to exceed 30 days, to respond to requests of the District Engineer.

On January 31, 2007, the USACE published a memorandum clarifying the Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic

[6] Environmental Laboratory. 1987. Cor*ps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1)*. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Preservation (ACHP) implementing regulations.[7] The Interim Guidance applies to all Department of the Army requests for authorization/verification, including Individual Permits (IPs, i.e., standard permits and letters of permission) and all Regional General Permits (RGPs) and Nationwide Permits (NWPs). The State or Tribal Historic Preservation Officer (SHPO/THPO) has 30 days to respond to a determination that a proposed activity, which otherwise qualifies for an NWP or an RGP, has no effect or no adverse effect on a historic property. If the SHPO/THPO does not respond within 30 days of notification, the Los Angeles District may proceed with verification. If the SHPO/THPO disagrees with the District's determination, the District may work with the SHPO/THPO to resolve the disagreement or request an opinion from the ACHP. The USACE will submit the Draft Jurisdictional Delineation Report to the SHPO/THPO for review prior to initiating the actual regulatory process.

Please note that, if the USACE determines that the drainages/waterbodies are jurisdictional and would be impacted by project implementation, the Applicant will be required to obtain a CWA Section 401 Water Quality Certification from the RWQCB before the USACE will issue the Section 404 Permit. If the USACE determines that the impacted drainage/waterbody is not jurisdictional, the Applicant will be required to obtain RWQCB authorization under the provisions of a Report of Waste Discharge (ROWD).

Jurisdictional Determinations

Pursuant to USACE Regulatory Guidance Letter (RGL) 08-02 (dated June 26, 2008), the USACE can issue two types of jurisdictional determinations to implement Section 404 of the CWA: Approved Jurisdictional Determinations and Preliminary Jurisdictional Determinations.[8] An Approved Jurisdictional Determination is an official USACE determination that jurisdictional "waters of the U.S.", "Navigable Waters of the U.S.", or both are either present or absent on a site. An Approved Jurisdictional Determination also identifies the precise limits of jurisdictional waters on a project site.

The USACE will provide an Approved Jurisdictional Determination when (1) an Applicant requests an official jurisdictional determination; (2) an Applicant contests jurisdiction over a particular water body or wetland; or (3) when the USACE determines that jurisdiction does not exist over a particular water body or wetland. The Approved Jurisdictional Determination then becomes the USACE's official determination that can then be relied upon over a five-year period to request regulatory authorization as part of the permit application.

In addition, an Applicant may decline to request an Approved Jurisdictional Determination and instead obtain a USACE IP or General Permit Authorization based on a Preliminary Jurisdictional Determination or, in certain circumstances (e.g., authorizations by non-reporting nationwide general permits), with no Jurisdictional Determination.

Preliminary Jurisdictional Determinations are non-binding, advisory in nature, and may not be appealed. They indicate that there may be "waters of the U.S." on a project site. An Applicant may elect to use a Preliminary Jurisdictional Determination to voluntarily waive or set aside questions regarding CWA jurisdiction over a site, usually in the interest of expediting the permitting process. The USACE will determine what form of Jurisdictional Determination is appropriate for a particular project site.

The USACE Regulatory Branch Offices will coordinate with the USEPA Regional Office and USACE Headquarters (HQ), as outlined in its January 28, 2008, memorandum entitled "Process

[7] USACE. 2007 (January 31). Memorandum: Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) Implementing Regulations. Washington, D.C.: USACE.

[8] USACE. 2008b (June 26). Regulatory Guidance Letter. Jurisdictional Determinations. Washington, D.C.: USACE.

for Coordinating Jurisdictional Determinations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the *Rapanos* and *SWANCC* Supreme Court Decisions".[9] The guidance provided in this memorandum is quoted as follows:

> 1. Effective immediately, unless and until paragraph 5(b) of the June 5, 2007, Rapanos guidance coordination memorandum is modified by a joint memorandum from Army and EPA, we will follow these procedures:
>
>   a. For jurisdictional determinations involving significant nexus determinations, USACE districts will send copies of draft jurisdictional delineations via e-mail to appropriate EPA regional offices. The EPA regional office will have 15 calendar days to decide whether to take the draft jurisdictional delineation as a special case under the January 19, 1989, "Memorandum of Agreement Between the Department of the Army and the USEPA Concerning the Determination of the Section 404 Program and the Application of the Exceptions under Section 404(f) of the Clean Water Act." If the EPA regional office does not respond to the district within 15 days, the district will finalize the jurisdictional determination.
>
>   b. For jurisdictional determinations involving isolated waters determinations, the agencies will continue to follow the procedure in paragraph 5(b) of June 5, 2007, coordination memorandum, until a new coordination memorandum is signed by USACE and EPA. (In accordance with paragraph 6 of the June 5, 2007, coordination memorandum, this is a 21-day timeline that can only be changed through a joint memorandum between agencies).
>
> 2. Approved JDs are not required for non-reporting NWPs, unless the project proponent specifically requests an approved JD. For proposed activities that may qualify for authorization under a State Programmatic General Permit (SPGP) or RGP, an approved JD is not required unless requested by the project proponent.
>
> 3. The USACE will continue to work with EPA to resolve the JDs involving significant nexus and isolated waters determinations that are currently in the elevation process.
>
> 4. USACE districts will continue posting completed Approved JD Forms on their web pages.

Regional Water Quality Control Board

The RWQCB is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The RWQCB's jurisdiction extends to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated).

Section 401 of the CWA provides the RWQCB with the authority to regulate, through a Water Quality Certification, any proposed, federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the USACE pursuant to Section 404 of the CWA. Section 401 requires the RWQCB to provide certification that there is reasonable assurance that an activity which may result in discharge to navigable waters will not violate water quality standards. Water Quality Certification must be based on a finding that the

[9] USACE. 2008c (January 28). *Memorandum for Commander, Major Subordinate Commands and District Commands. Process for Coordinating Jurisdictional Determinations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the Rapanos and SWANCC Supreme Court Decisions.* Washington, D.C.: USACE.

proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the nine RWQCBs' Basin Plans.

The Porter-Cologne Act provides the State with very broad authority to regulate "waters of the State" (which are defined as any surface water or groundwater, including saline waters). The Porter-Cologne Act has become an important tool in the post-SWANCC (Solid Waste Agency of Northern Cook Counties vs. Unites States Army Corps of Engineers) and Rapanos era with respect to the State's authority over isolated waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file an ROWD when there is no federal nexus, such as under Section 404(b)(1) of the CWA. Although "waste" is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

Section 401 Water Quality Certification

Issuance of the USACE Section 404 Permit would be contingent upon the approval of a Section 401 Water Quality Certification from the RWQCB. Also, the RWQCB requires certification of the project's California Environmental Quality Act (CEQA) documentation before it will approve the Section 401 Water Quality Certification or ROWD. The RWQCB, as a responsible agency, will use the project's CEQA document to satisfy its own CEQA-compliance requirements.

On June 1, 2020, the USEPA finalized the "Clean Water Act Section 401 Certification Rule" to implement the water quality certification process consistent with the text and structure of the Clean Water Act (CWA). The final rule establishes procedures that promote consistent implementation of CWA section 401 and regulatory certainty in the federal licensing and permitting process. The new regulation includes reviews and approvals by the USACE prior to the RWQCB issuing a 401 Certification and reviews and approvals by the EPA prior to the USACE issuing a 404. The new 401 rule went into effect on September 11, 2020.

The new certification rule defines a discharge subject to 401 Certification as a discharge from a point source into a water of the United States. The new rule also states that States with additional water quality regulations cannot use these to expand the certification request.

The new rule requires all project proponents to request a pre-filing meeting with the RWQCB at least 30 days prior to filing a 401 "Certification Request". The filing procedure has been simplified to require the filing of a "Certification Request", rather than the acceptance of a "complete application". The certification request has nine mandatory components:

1. identify the project proponent(s) and a point of contact;
2. identify the proposed project;
3. identify the applicable federal license or permit;
4. identify the location and nature of any potential discharge that may result from the proposed project and the location of receiving waters;
5. include a description of any methods and means proposed to monitor the discharge and the equipment or measures planned to treat, control, or manage the discharge;
6. include a list of all other federal, interstate, tribal, state, territorial, or local agency authorizations required for the proposed project, including all approvals or denials already received;
7. include documentation that a pre-filing meeting request was submitted to the certifying authority at least 30 days prior to submitting the certification request;

8. contain the following statement: 'The project proponent hereby certifies that all information contained herein is true, accurate, and complete, to the best of my knowledge and belief; and
9. contain the following statement: 'The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.'

There is a mandatory 30 day wait period between a pre-filing meeting request and the filing of a Certification Request. A Certification Request must be filed with the RWQCB and the USACE concurrently. USACE reviews the Certification Request for the nine required components. The USACE has 15 days to review the Certification Request. The USACE then notifies the RWQCB that request is complete. And concurrently notifies the RWQCB of the reasonable time period to act on the Certification Request. The reasonable time period is not to exceed 1 year. Within 15 days of receipt of the Certification Request, the RWQCB must provide the applicant with the following: 1) date of receipt; 2) applicable reasonable period of time to act on the Certification Request; and 3) date upon which waiver will occur if the certifying authority fails or refuses to act on the Certification Request.

Once the RWQCB issues the 401 Certification, the USACE has 5 days to notify the USEPA that the 401 Certification has been issued. The USEPA then has 30 days to notify neighboring jurisdictions of the 401 Certification. Neighboring jurisdictions have 60 days to respond. If there are no objections to the 401 Certification, then the USACE would issue the 404 permit.

On June 2, 2021, the USEPA published a notice of intention to reconsider and revise the Clean Water Act Section 401 Certification Rule. At this time, they are currently accepting public comment. Until a new rule goes into effect, the current 401 Certification Rule stands.

The RWQCB is required under the *California Code of Regulations* (CCR) to have a "minimum 21-day public comment period" before any action can be taken on the Section 401 application.[10] This period closes when the RWQCB acts on the application. Since projects often change or are revised during the Section 401 permit process, the comment period can remain open. The public comment period starts as soon as an application has been received. Generally, the RWQCB Section 401, USACE Section 404, and CDFW Section 1602 permit applications are submitted at the same time.

The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications. The notification/application for a CWA Section 401 Water Quality Certification must also address compliance with the Basin Plan. Please note that filing an application would also require the payment of an application fee which would be based on project impacts. The fee schedule calculator is available at https://www.waterboards.ca.gov/resources/fees/water_quality/docs/dredgefillcalculator.xlsm.

California Department of Fish and Wildlife

The CDFW has jurisdictional authority over wetland resources associated with rivers, streams, and lakes pursuant to the *California Fish and Game Code*.[11] Activities of State and local agencies as well as public utilities that are project proponents are regulated by the CDFW under Section 1602 of the *California Fish and Game Code.* This section regulates any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any

[10] 23 CCR §3858(a)
[11] See §§1600–1616.

material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Section 1602 of the *California Fish and Game Code* applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State.

The CDFW jurisdictional limits are not as clearly defined by regulation as those of the USACE. While they closely resemble the limits described by USACE regulations, they include riparian habitat supported by a river, stream, or lake regardless of the presence or absence of hydric and saturated soils conditions. In general, the CDFW takes jurisdiction from the top of a stream bank or to the outer limits of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place within or in the vicinity of a river, stream, lake or within or in the vicinity of tributaries to a river, stream, or lake. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish and other aquatic plant and/or wildlife species. It also includes watercourses that have a surface or subsurface flow that support or have supported riparian vegetation.

Section 1602 Lake or Streambed Alteration Agreement

The CDFW enters into a Lake or Streambed Alteration (LSA) Agreement with a project proponent to ensure protection of wildlife and habitat values and acreages.

Prior to construction, a Notification of an LSA must be submitted to the CDFW that describes any proposed lake or streambed alteration that would occur with implementation of a project. The Notification of an LSA must address the initial construction and long-term operation and maintenance of any structures (such as a culvert or a desilting basin) included in the project design that are located within any river, stream, or lake and that may require periodic maintenance. In addition to the formal application materials and the fee, a copy of the appropriate environmental document (e.g., a Mitigated Negative Declaration) should be included in the submittal, consistent with CEQA requirements. The complete notification package must be completed on CDFW's Environmental Permit Information Management System (EPIMS). This notification will serve as the basis for the CDFW's issuance of a Section 1602 LSA Agreement. Note that notification is not required before beginning emergency work, but the CDFW must be notified in writing within 14 days after beginning the work.

After receiving Notification of an LSA Agreement, the CDFW will determine whether an LSA Agreement will be required for the proposed activity. An LSA Agreement will be required if the activity could substantially adversely affect an existing fish and wildlife resource. If an LSA Agreement is required, the CDFW may want to conduct an on-site inspection.

If the CDFW does not respond in writing concerning the completeness of the Notification within 30 days of its submittal, the Notification automatically becomes complete. If the CDFW does not submit a draft LSA Agreement to the Applicant within 60 days of the determination of a completed Notification package, the CDFW will issue a letter that either (1) identifies the final date to transmit a draft LSA Agreement or (2) indicates that an LSA Agreement was not required. The CDFW will also indicate that it was unable to meet this mandated compliance date and that, by law, the Applicant is authorized to complete the project without an LSA Agreement as long as the Applicant constructs the project as proposed and complies with all avoidance, minimization, and mitigation measures described in the submitted Notification package. Please note that, if the project requires revisions to the design or project construction, the CDFW may require submittal of a new Notification/application with an additional 90-day permit process.

If determined to be necessary, the CDFW will prepare a draft LSA Agreement, which will include standard measures to protect fish and wildlife resources during project construction and during

ongoing operation and maintenance of any project element that occurs within a CDFW jurisdictional area. The draft Agreement must be transmitted to the Applicant within 60 calendar days of the CDFW's determination that the notification is complete. It should be noted that the 60-day timeframe might not apply to long-range agreements.

Following receipt of a draft LSA Agreement from the CDFW, the Applicant has 30 calendar days to notify the CDFW concerning the acceptability of the proposed terms, conditions, and measures. If the Applicant agrees with these terms, conditions and measures, the Agreement must be signed and returned to the CDFW. The Agreement becomes final once the CDFW executes it and an LSA Agreement is issued. Please note that all application fees must be paid and the final certified CEQA documentation must be provided prior to the CDFW's execution of the Agreement.

ATTACHMENT B

SITE PHOTOGRAPHS



Aerial Source: Esri, Maxar 2022

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Photo Locations

Exhibit B-1

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

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Feet

PSOMAS

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Photo Location 1, facing upstream. February 10, 2022. View of San Rafael Creek.



Photo Location 1, facing downstream. February 10, 2022. View of San Rafael Creek.

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Site Photos

Exhibit B-2

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

PSOMAS

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Photo Location 2, facing upstream. February 10, 2022. View of San Rafael Creek.



Photo Location 3. February 10, 2022. View of diversion structure in the mainstem Arroyo Seco channel.

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Photo Location 4, facing upstream. February 10, 2022. View of channel conditions in San Pascual Basin area.



Photo Location 4, facing downstream. February 10, 2022. View of channel conditions in San Pascual Basin area.

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Photo Location 5, facing upstream. February 10, 2022. View of channel conditions in San Pascual Basin area.



Photo Location 5, facing downstream. February 10, 2022. View of channel conditions in San Pascual Basin area.

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Photo Location 6, facing downstream. February 10, 2022. View of wetland area in downstream end of San Pascual Basin area.



February 10, 2022. View of wetland sampling point 1, near outlet structure at upstream end of San Pascual Basin area. Note that the outlet structure in background is nearly completed filled with sediment.

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Site Photos

Exhibit B-6

Jurisdictional Delineation Report for the Arroyo Seco Water Reuse and Natural Stream Restoration Project

PSOMAS

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February 10, 2022. View of wetland sampling point 2 near the midpoint of the San Pascual Basin area.



February 10, 2022. View of wetland sampling point 3 near the upstream end of the wetland area in the San Pascual Basin area.

ATTACHMENT C

LITERATURE REVIEW DETAILS

DESCRIPTIONS OF SOILS IN SURVEY AREA

LOS ANGELES COUNTY, SOUTHEASTERN, SOIL SURVEY AREA, CALIFORNIA

Urban land-Xerorthents-Osito complex, 10 to 35 percent slopes

Map Unit Setting

- *National map unit symbol:* 2sx6h
- *Elevation:* 420 to 1,140 feet
- *Mean annual precipitation:* 18 to 21 inches
- *Mean annual air temperature:* 64 to 67 degrees F
- *Frost-free period:* 350 to 365 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Urban land:* 35 percent
- *Xerorthents, shallow, and similar soils:* 30 percent
- *Osito and similar soils:* 25 percent
- *Minor components:* 10 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Urban Land

Setting

- *Landform:* Hillslopes

Properties and qualities

- *Slope:* 0 to 5 percent
- *Depth to restrictive feature:* 0 inches to manufactured layer
- *Runoff class:* Very low

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 8
- *Hydric soil rating:* No

Description of Xerorthents, Shallow

Setting

- *Landform:* Hillslopes
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope, riser, tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Human-transported material

Typical profile

- *A - 0 to 3 inches:* loam
- *Cu - 3 to 9 inches:* sandy loam
- *C - 9 to 13 inches:* loamy sand
- *R - 13 to 23 inches:* bedrock

Properties and qualities

- *Slope:* 10 to 35 percent
- *Depth to restrictive feature:* 10 to 59 inches to lithic bedrock
- *Drainage class:* Well drained
- *Runoff class:* Medium
- *Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Maximum salinity:* Nonsaline (0.0 to 1.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Very low (about 1.6 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 6e
- *Hydrologic Soil Group:* D
- *Hydric soil rating:* No

Description of Osito

Setting

- *Landform:* Hillslopes
- *Landform position (two-dimensional):* Summit, shoulder, backslope
- *Landform position (three-dimensional):* Side slope, crest
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Parent material:* Colluvium and/or residuum weathered from sandstone

Typical profile

- *A - 0 to 4 inches:* sandy loam
- *Bw1 - 4 to 15 inches:* sandy loam
- *Bw2 - 15 to 21 inches:* sandy loam
- *Cr - 21 to 31 inches:* bedrock

Properties and qualities

- *Slope:* 10 to 35 percent
- *Depth to restrictive feature:* 10 to 22 inches to paralithic bedrock
- *Drainage class:* Well drained
- *Runoff class:* Low
- *Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* None
- *Frequency of ponding:* None
- *Maximum salinity:* Nonsaline (0.0 to 1.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 4e
- *Hydrologic Soil Group:* B

- *Hydric soil rating:* No

Minor Components

Typic haploxeralfs, moderately deep

- *Percent of map unit:* 8 percent
- *Landform:* Hillslopes
- *Landform position (two-dimensional):* Summit, backslope
- *Landform position (three-dimensional):* Crest, side slope
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Hydric soil rating:* No

Chumash

- *Percent of map unit:* 2 percent
- *Landform:* Hillslopes
- *Landform position (two-dimensional):* Backslope
- *Landform position (three-dimensional):* Side slope
- *Down-slope shape:* Convex
- *Across-slope shape:* Convex
- *Hydric soil rating:* No

Urban land, frequently flooded, 0 to 5 percent slopes

Map Unit Setting

- *National map unit symbol:* 2myv7
- *Elevation:* 0 to 1,190 feet
- *Mean annual precipitation:* 12 to 24 inches
- *Mean annual air temperature:* 63 to 66 degrees F
- *Frost-free period:* 320 to 365 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Urban land, frequently flooded:* 95 percent
- *Minor components:* 5 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Urban Land, Frequently Flooded

Setting

- *Landform:* Channels
- Properties and qualities
- *Slope:* 0 to 5 percent
- *Depth to restrictive feature:* 0 inches to manufactured layer
- *Runoff class:* Very high
- *Frequency of flooding:* Frequent, None

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 8
- *Hydrologic Soil Group:* B
- *Hydric soil rating:* No

Minor Components

Water

- *Percent of map unit:* 5 percent

Soboba and Tujunga soils, 0 to 5 percent slopes, frequently flooded

Map Unit Setting

- *National map unit symbol:* 2rshk
- *Elevation:* 400 to 2,350 feet
- *Mean annual precipitation:* 17 to 29 inches
- *Mean annual air temperature:* 64 to 66 degrees F
- *Frost-free period:* 300 to 365 days
- *Farmland classification:* Not prime farmland

Map Unit Composition

- *Soboba and similar soils:* 60 percent
- *Tujunga and similar soils:* 25 percent
- *Minor components:* 15 percent
- *Estimates are based on observations, descriptions, and transects of the mapunit.*

Description of Soboba

Setting

- *Landform:* Washes, debris flows, stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium derived from granite

Typical profile

- *A - 0 to 3 inches:* very gravelly sand
- *C1 - 3 to 15 inches:* very gravelly sand
- *C2 - 15 to 61 inches:* extremely gravelly sand
- *C3 - 61 to 79 inches:* extremely cobbly sand

Properties and qualities

- *Slope:* 0 to 2 percent
- *Surface area covered with cobbles, stones or boulders:* 0.8 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Excessively drained
- *Runoff class:* Negligible
- *Capacity of the most limiting layer to transmit water (Ksat):* Very high (19.98 to 59.94 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* Frequent, None
- *Frequency of ponding:* None
- *Available water supply, 0 to 60 inches:* Very low (about 1.9 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 6s
- *Hydrologic Soil Group:* A
- *Ecological site:* R019XG905CA - Riparian
- *Hydric soil rating:* No

Description of Tujunga

Setting

- *Landform:* Stream terraces, inset fans, washes
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Parent material:* Alluvium derived from granite

Typical profile

- *A - 0 to 9 inches:* loam
- *2C1 - 9 to 14 inches:* sand
- *2C2 - 14 to 17 inches:* gravelly sand
- *2C3 - 17 to 79 inches:* stratified sand

Properties and qualities

- *Slope:* 0 to 2 percent
- *Depth to restrictive feature:* More than 80 inches
- *Drainage class:* Somewhat excessively drained
- *Runoff class:* Low
- *Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
- *Depth to water table:* More than 80 inches
- *Frequency of flooding:* Frequent, None
- *Frequency of ponding:* None
- *Maximum salinity:* Nonsaline (0.0 to 1.0 mmhos/cm)
- *Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

Interpretive groups

- *Land capability classification (irrigated):* None specified
- *Land capability classification (nonirrigated):* 4e
- *Hydrologic Soil Group:* B
- *Ecological site:* R019XG909CA - Terrace
- *Hydric soil rating:* No

Minor Components

Aquic xerofluvents

- *Percent of map unit:* 5 percent
- *Landform:* Stream terraces
- *Landform position (three-dimensional):* Tread
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear
- *Hydric soil rating:* No

Typic psammaquents

- *Percent of map unit:* 5 percent
- *Landform:* Washes, flood plains
- *Landform position (three-dimensional):* Rise
- *Down-slope shape:* Linear
- *Across-slope shape:* Linear

- *Hydric soil rating:* No

Dam

- *Percent of map unit:* 3 percent
- *Hydric soil rating:* No

Urban land

- *Percent of map unit:* 2 percent
- *Landform:* Washes
- *Hydric soil rating:* No

DESCRIPTION OF WETLAND RESOURCES CLASSIFICATIONS

The following is a complete description of the wetland codes from the National Wetland Inventory provided in Section 3.3.

Arroyo Seco Channel (R4SBCx)

- **R: System RIVERINE.** The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.
    - **4: Subsystem INTERMITTENT.** This Subsystem includes channels that contain flowing water only part of the year. When the water is not flowing, it may remain in isolated pools or surface water may be absent.
        - **SB: Class STREAMBED.** Includes all wetlands contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide.
            - **C: Water Regime Modifier SEASONALLY FLOODED.** This modifier refers to areas in which surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.
                - x**: Special Modifier EXCAVATED.** This modifier is used to identify wetland basins or channels that were excavated by humans.

San Rafael Creek (PSSA)

- **P: System PALUSTRINE.** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 part per trillion (ppt). Wetlands lacking (such vegetation) are also included if they exhibit all of the following characteristics: (1) are less than 8 hectares (20 acres); (2) do not have an active wave-formed or bedrock shoreline feature; (3) have at low water a depth of less than 6.6 feet in the deepest part of the basin; and (4) have salinity due to ocean-derived salts of less than 0.5 ppt.
    - **SS: Class SCRUB-SHRUB.** Includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.
        - **A: Water Regime Modifier TEMPORARILY FLOODED.** This modifier refers to areas in which surface water is present for brief periods during growing season, but the water table usually lies well below the soil surface for most of the growing season. Plants that grow both in uplands and wetlands may be characteristic of this water regime.

San Pascual Basin (PFOCh and Rp1FO)

- **P: System PALUSTRINE.** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 part per trillion (ppt). Wetlands lacking (such vegetation) are also included if they exhibit all of the following characteristics: (1) are less than 8 hectares (20 acres); (2) do not have an active wave-formed or bedrock shoreline feature; (3) have at low water a depth of less than 6.6 feet in the deepest part of the basin; and (4) have salinity due to ocean-derived salts of less than 0.5 ppt.
    - **FO: Class FORESTED.** This Class is characterized by woody vegetation that is 6 meters (20 feet) tall or taller.
        - **C: Water Regime Modifier SEASONALLY FLOODED.** This modifier refers to areas in which surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.
            - **h: Special Water Regime Modifier DIKED/IMPOUNDED.** This special modifier refers to areas that have been created or modified by a man-made barrier or dam which obstructs the inflow or outflow of water.

- **Rp: System RIPARIAN.** Plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: (1) distinctively different vegetative species than adjacent areas, and (2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland.
    - **1: Subsystem LOTIC.** This subsystem relates to freshwater habitats with fast moving water.
        - **FO: Class FORESTED.** This Class is characterized by woody vegetation that is 6 meters (20 feet) tall or taller.

BASIN PLAN BENEFICIAL USES

The *Water Quality Control Plan: Los Angeles Region* (Basin Plan) identifies a number of beneficial uses, some or all of which may apply to a specific hydrologic subarea (HSA), including: Municipal and Domestic Water Supply (MUN) waters; Agricultural Supply (AGR) waters; Industrial Process Supply (PROC) waters; Industrial Service Supply waters (IND); Groundwater Recharge (GWR) waters; Freshwater Replenishment (FRSH); Navigation (NAV) waters; Hydropower Generation (POW) waters; Water Contact Recreation (REC1) waters; Non-Contact Water Recreation (REC2) waters; Commercial and Sport Fishing (COMM) waters; Aquaculture (AQUA) waters; Warm Fresh Water Habitat (WARM) waters; Cold Fresh Water Habitat (COLD) waters; Inland Saline Water Habitat (SAL) waters; Estuarine Habitat (EST) waters; Wetland Habitat (WET) waters; Marine Habitat (MAR) waters; Wildlife Habitat (WILD) waters; Preservation of Biological Habitats of Special Significance (BIOL) waters; Rare, Threatened or Endangered Species (RARE) waters; Migration of Aquatic Organisms (MIGR) waters; Spawning, Reproduction and Development (SPWN) waters; and Shellfish Harvesting (SHELL) waters.

Beneficial Uses associated with East Canyon Channel and Los Angeles River Reach 3, into which the Project site drains, are described below; beneficial uses not described below do not apply to these areas.

- MUN waters support community, military, or individual water supply systems including, but not limited to, drinking water supply.
- IND waters are used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- GWR waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting saltwater intrusion into freshwater aquifers.
- WARM waters support warm water ecosystems that may include, but are not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, and wildlife (including invertebrates).
- COLD waters support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- WET waters support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.
- REC-1 waters are used for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- REC-2 waters are used for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

ATTACHMENT D

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Arroyo Seco Water Reuse City/County: South Pasadena / Los Angeles Sampling Date: Feb 10, 2022

Applicant/Owner: City of South Pasadena State: CA Sampling Point: 1

Investigator(s): David Hughes, Trevor Bristle Section, Township, Range: Section 29, Township 1N, Range 12W

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): Mediterranean California Lat: 34.121071° Long: -118.167636° Datum: NAD 83

Soil Map Unit Name: Soboba and Tujunga Soils NWI classification: PFOCh

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:

Sampling point is located near inflow point of water flowing into basin from diversion weir

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus agrifolia	70	Y	UPL
2. Platanus racemosa	20	Y	FAC
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Sambucus nigra ssp. caerulina	20	Y	FACU
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Bromus sp.	5	Y	UPL
2. Oxalis pes-capre	2	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	7	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	20	x 4 =	80
UPL species	77	x 5 =	385
Column Totals:	117 (A)		525 (B)

Prevalence Index = B/A = 4.49

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-24	10 YR 3/1	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 6

Water Table Present? Yes ✓ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Arroyo Seco Water Reuse City/County: South Pasadena / Los Angeles Sampling Date: Feb 10, 2022

Applicant/Owner: City of South Pasadena State: CA Sampling Point: 2

Investigator(s): David Hughes, Trevor Bristle Section, Township, Range: Section 29, Township 1N, Range 12W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): Mediterranean California Lat: 34.120643° Long: -118.167209° Datum: NAD 83

Soil Map Unit Name: Soboba and Tujunga Soils NWI classification: PFOCh

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 – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus uhdei	40	Y	UPL
2. Chitalpa tashkentensis	20	Y	UPL
3. Washingtonia robusta	10	N	FACW
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Rubus ursinus	50	Y	FAC
2.			
	50	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 10	x 2 = 20
FAC species 50	x 3 = 150
FACU species 0	x 4 = 0
UPL species 60	x 5 = 300
Column Totals: 120 (A)	470 (B)

Prevalence Index = B/A = 3.92

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10 YR 2/2	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

soil consists of partially decomposed organic material in top 2+ inches of soil which is generally sandy

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 2

Water Table Present? Yes ✓ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

channel is wider at this point of survey area than sampling point 1 so that the surface water depth is less

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Arroyo Seco Water Reuse City/County: South Pasadena / Los Angeles Sampling Date: Feb 10, 2022

Applicant/Owner: City of South Pasadena State: CA Sampling Point: 3

Investigator(s): David Hughes, Trevor Bristle Section, Township, Range: Section 29, Township 1N, Range 12W

Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): Mediterranean California Lat: 34.120643° Long: -118.167209° Datum: NAD 83

Soil Map Unit Name: Soboba and Tujunga Soils NWI classification: PFOCh

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:

sampling point is near downstream end of basin where Typha begins to dominate

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Washingtonia robusta	50	Y	FACW
2. Salix gooddingii	20	Y	FACW
3. Schinus terebinthifolius	5	N	FAC
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Typha sp.	5	Y	OBL
2. Cyperus eragrostis	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	10	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Rubus ursinus	5	Y	FAC
2.			
	5	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	75	x 2 =	150
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		185 (B)

Prevalence Index = B/A = 2.06

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 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
0-12	10 YR 2/1	100					sandy loa	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ✓ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: hard packed soil

Depth (inches): 12

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 3

Water Table Present? Yes ✓ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ATTACHMENT E

NATIONWIDE PERMIT SUMMARY

NATIONWIDE PERMIT 59: WATER RECLAMATION AND REUSE FACILITIES

Discharges of dredged or fill material into non-tidal waters of the United States for the construction, expansion, and maintenance of water reclamation and reuse facilities, including vegetated areas enhanced to improve water infiltration and constructed wetlands to improve water quality. The discharge must not cause the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

This NWP also authorizes temporary fills, including the use of temporary mats, necessary to construct the water reuse project and attendant features. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows.

After construction, temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 31.) (Authority: Sections 10 and 404)

GENERAL CONDITION 31: PRE-CONSTRUCTION NOTIFICATION

a. Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

    1. He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

    2. 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee

may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

b. Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

1. Name, address and telephone numbers of the prospective permittee;

2. Location of the proposed project;

3. A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

4. The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

5. If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

6. If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

7. For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the

historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

c. Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

d. Agency Coordination:

1. The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

2. For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments.

   The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

3. In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

4. Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

APPENDIX B

SPECIAL STATUS PLANT REPORT

PSOMAS

Balancing the Natural and Built Environment

January 23, 2026

Brent Maue
City of Pasadena
Department of Public Works
100 North Garfield Avenue
Pasadena, California 91101

VIA EMAIL
bmaue@cityofpasadena.net

Subject: Results of the Focused Special Status Plant Survey Conducted for the Arroyo Seco Water Reuse ,Cites of Pasadena, South Pasadena, and Los Angeles, in Los Angeles County, California

Dear Mr. Maue:

This Letter Report presents the findings of a special status plant survey conducted for the Arroyo Seco Water Reuse Project (hereinafter referred to as the "Project site") located in the cities of Pasadena, South Pasadena, and Los Angeles, in Los Angeles County, California (Exhibit 1). The purpose of the survey was to determine the presence or absence of special status plant species on the Project site.

PROJECT LOCATION AND DESCRIPTION

The approximately 3.60-acre project site is located in the cities of Pasadena, South Pasadena, and Los Angeles, in Los Angeles County, California. The Project site is generally centered along a portion of the Arroyo Seco Channel that begins just south of the San Rafael Avenue bridge in the city of Pasadena and extends approximately ½-mile south (downstream), near the 110-freeway overpass in the city of South Pasadena (Exhibit 1). In addition to Pasadena and South Pasadena, the Project site also passes through a portion of the city of Los Angeles. The Project site is located on the U.S. Geological Survey's (USGS') Pasadena and Los Angeles 7.5-minute quadrangles of the San Bernardino Meridian at Township 1 North, Range 12 West, Section 32 and Township 1 South, Range 12 West, Section 5 (Exhibit 2).

The proposed Project involves the diversion of stormwater runoff from San Rafael Creek into treatment wetlands that will be created in an adjacent upland area. These treatment wetlands will improve water quality and allow for soil infiltration before discharging this treated water into the Arroyo Seco. Further downstream, water will be diverted from the Arroyo Seco to water treatment facilities and infiltration basins that will be constructed in the approximate 2.2-acre San Pascual Basin site.

Vegetation on the site is comprised of disturbed coast live oak woodland, coast live oak - western sycamore woodland, Peruvian pepper tree - coast live oak woodland, non-native ornamental woodland, disturbed blue elderberry - laurel sumac scrub, non-native grassland, bare ground, developed, and disturbed (Exhibit 3). Soils mapped on the project site include Urban land-Xerorthents-Osito complex, 10 to

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35 percent slopes; Urban land, frequently flooded, 0 to 5 percent slopes; Soboba and Tujunga soils, 0 to 5 percent slopes, frequently flooded (Exhibit 4).

METHODS

Botanical surveys were floristic in nature and consistent with the protocols created by the California Department of Fish and Wildlife (CDFW) (CDFW 2018). Prior to the field surveys, a literature search was conducted to identify special status plant species reported from the vicinity of the project site. Sources reviewed included the USGS Pasadena, Burbank, Hollywood, Los Angeles, El Monte, and Mt. Wilson 7.5-minute quadrangles in the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (CNPS 2025) and the CDFW's California Natural Diversity Database (CDFW 2025a).

Rainfall received in the winter and spring determines the germination of many annual and perennial herb species. The region received approximately 9.96 inches of precipitation between July 2021 and June 2022 (data taken from Burbank Station) (CIMIS 2023). The average annual precipitation for this area is approximately 13.91 inches.

Reference populations were monitored for annual and difficult-to-detect target species to ensure that the surveys were comprehensive (Table 1). This is especially relevant during periods of unusual rainfall patterns or below average rainfall. If conditions at a nearby reference population are suitable for germination and growth, then it can be inferred that conditions would also be suitable on the project site. Reference populations were not monitored for species with a California Rare Plant Rank (CRPR) of 3 or 4, large perennials which would be identifiable throughout the year, or for species lacking a publicly accessible reference population.

TABLE 1
REFERENCE POPULATIONS MONITORED IN THE PROJECT REGION

Species	Date Observed	Location	Phenology
Plummer's mariposa lily *Calochortus plummerae*	June 2, 2022	Eaton Canyon	in bloom

Psomas Biologist Sarah Thomas conducted special status plant survey for special status plants on June 16, 2022. The surveys comprised 5 total person-hours. The plant survey area included the entire project site boundary (Exhibit 5). The potentially suitable habitats for special status plants on the project site were systematically surveyed to the extent possible during the site visit. All plant species observed were recorded in field notes. Plants were identified using taxonomic keys, descriptions, and illustrations in Jepson Flora Project (2025), Baldwin et al. (2012), Hickman (1993), and Munz (1974). Nomenclature of plant taxa conform to the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2025b) for special status species and the Jepson eFlora (Jepson Flora Project 2025) for all other taxa.

Any special status plant species observed on the project site would be mapped using a Garmin handheld Global Positioning System unit and data would be collected on the number and phenology of individuals (estimated for large populations) and microsite characteristics (e.g., slope, aspect, soil texture, surrounding habitat, and associated species).

SURVEY RESULTS

One special status plant was observed adjacent to, but off the project site: Southern California black walnut (*juglans californica*) This species is documented in detail within the project Tree Report under separate cover. Table 2 identifies the special status plants reported from the literature review with their status, their potential to occur on the project site, and the survey results. A list of all plant species observed on the project site during the survey is included in Attachment A.

TABLE 2
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR
IN THE SURVEY AREA VICINITY

Scientific Name	Common Name	State Status	Federal Status	CRPR	Species Background	Potential
Acanthoscyphus parishii var. *parishii*	Parish's oxytheca			4.2	Annual herb. Sandy to gravelly soil in chaparral and lower montante coniferous forest; 4,002–8,528 ft. Southern California County Distribution: Los Angeles, San Bernardino, Ventura. Blooming period: June–September	Not expected to occur; outside current known elevational range.
Arctostaphylos glandulosa ssp. gabrielensis	San Gabriel manzanita			1B.2	Evergreen shrub. Rocky soil in chaparral; 1,952–4,920 ft. Southern California County Distribution: Los Angeles, San Bernardino. Blooming period: March	Not expected to occur; outside current known elevational range.
Arenaria paludicola	marsh sandwort	FE	SE	1B.1	Perennial stoloniferous herb. Sandy soils in marshes and swamps with brackish freshwater; 10–558 ft. Southern California County Distribution: Los Angeles, San Bernardino (Presumed extirpated). Blooming period: May–August	Not expected to occur; no suitable habitat.
Asplenium vespertinum	western spleenwort			4.2	Perennial rhizomatous herb. Rocky areas in chaparral, cismontane woodland, and coastal scrub; 590–3,281 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura. Blooming period: February–June	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Astragalus brauntonii	Braunton's milk-vetch	FE		1B.1	Perennial herb. Recently burned and disturbed areas, in sandstone and carbonite soils, in chaparral, coastal scrub, and grasslands; 13–2,099 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, Ventura. Blooming period: January–August	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Atriplex parishii	Parish's brittlescale			1B.1	Annual herb. Alkaline soils in chenopod scrub, playas, and vernal pools; 82–6,232 ft. Southern California County Distribution: Los Angeles (Presumed extirpated), Orange (Presumed extirpated), Riverside, San Bernardino (Presumed extirpated), San Diego. Blooming period: June–October	Not expected to occur; no suitable habitat.
Atriplex serenana var. *davidsonii*	Davidson's saltscale			1B.2	Annual herb. Alkaline conditions in coastal bluff scrub and coastal scrub; 32–656 ft. Southern California County Distribution: Los Angeles (Presumed extirpated; Occurrence confirmed, but possibly extirpated), Orange, Riverside, San Diego, Ventura. Blooming period: April–October	Not expected to occur; no suitable habitat.
Berberis nevinii	Nevin's barberry	FE	SE	1B.1	Evergreen shrub. Sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, and riparian scrub; 898–2,707 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino, San Diego. Blooming period: March–June	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Calochortus catalinae	Catalina mariposa lily			4.2	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, and grassland; 49–2,296 ft. Southern California County Distribution: Los Angeles, Orange, San Bernardino, San Diego, Ventura. Blooming period: February–June	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Calochortus clavatus var. *gracilis*	slender mariposa lily			1B.2	Perennial bulbiferous herb. Chaparral, coastal scrub, grassland; 1,050–3,280 ft. Southern California County Distribution: Los Angeles, Ventura. Blooming period: March–June	Not expected to occur; outside current known elevational range.
Calochortus plummerae	Plummer's mariposa lily			4.2	Perennial bulbiferous herb. Granitic and rocky areas in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland; 328–5,576 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, Ventura. Blooming period: May–July	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Calochortus weedii var. *intermedius*	intermediate mariposa lily			1B.2	Perennial bulbiferous herb. Rocky and calcareous areas in chaparral, coastal scrub, and grassland; 345–2,804 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino. Blooming period: May–July	Not expected to occur; limited, marginally suitable habitat; few records in the region.
Calystegia felix	lucky morning-glory			3.1	Annual rhizomatous herb. Currently known from irrigated landscapes, but historically from meadows and seeps that are sometimes alkaline and alluvial riparian scrub; 98–705 ft. Southern California County Distribution: Los Angeles (Presumed extirpated), Riverside (Presumed extirpated), San Bernardino. Blooming period: March-September	Not expected to occur; no suitable habitat.
Camissoniopsis lewisii	Lewis' evening-primrose			3	Annual herb. Sandy or clay soils in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and grassland; 0–984 ft. Southern California County Distribution: Los Angeles, Orange (Presumed extirpated), San Diego. Blooming period: March–June	Not expected to occur; no suitable habitat.
Centromadia parryi ssp. *australis*	southern tarplant			1B.1	Annual herb. Found within the margin of marshes and swamps, vernally mesic soils in grassland, and vernal pools; 0–1,574 ft. Southern California County Distribution: Los Angeles, Orange, San Diego, Ventura. Blooming period: May–November	Not expected to occur; no suitable habitat.
Centromadia pungens ssp. *laevis*	smooth tarplant			1B.1	Annual herb. Alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, and grassland; 0–2,100 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino, San Diego. Blooming period: April–September	Not expected to occur; limited, marginally suitable habitat; few records in the region.
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower	FC	SE	1B.1	Annual herb. Sandy soil in coastal scrub and grassland; 492–4,002 ft. Southern California County Distribution: Los Angeles, Orange (Presumed extirpated), Ventura. Blooming period: April–July	Not expected to occur; no suitable habitat.
Chorizanthe parryi var. parryi	Parry's spineflower			1B.1	Annual herb. Sandy or rocky openings in chaparral, coastal scrub, cismontane woodland, and grassland; 902–4,001 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino. Blooming period: April–June	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Cladium californicum	California sawgrass			2B.2	Perennial rhizomatous herb. Meadows, seeps, marshes, and swamps either alkaline or freshwater; 197–2,837 ft. Southern California County Distribution: Los Angeles (Presumed extirpated), Riverside, San Bernardino. Blooming period: June–September	Not expected to occur; no suitable habitat.

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SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR
IN THE SURVEY AREA VICINITY

Scientific Name	Common Name	State Status	Federal Status	CRPR	Species Background	Potential
Convolvulus simulans	small-flowered morning-glory			4.2	Annual herb. Friable clay soils or serpentine seeps in chaparral openings, coastal scrub, and grassland; 98–2,297 ft. Southern California County Distribution: Kern, Los Angeles, Orange, Riverside, San Diego. Blooming period: March–July	Not expected to occur; no suitable habitat.
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder			2B.2	Parasitic annual vine. Marshes and freshwater swamps; 49–918 ft. Southern California County Distribution: Los Angeles, San Bernardino (Presumed extirpated). Blooming period: July–October.	Not expected to occur; no suitable habitat.
Dodecahema leptoceras	slender-horned spineflower	FE	SE	1B.1	Annual herb. Sandy soils in chaparral, cismontane woodland, and alluvial fan coastal scrub; 656–2,493 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino. Blooming period: April–June	Not expected to occur; no suitable habitat.
Dudleya multicaulis	many-stemmed dudleya			1B.2	Perennial herb. Often in clay soils in chaparral, coastal scrub, and grassland; 49–2,591 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego. Blooming period: April–July	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Galium angustifolium ssp. *gabrielense*	San Antonio Canyon bedstraw			4.3	Perennial herb. Granitic, sandy, or rocky soil in chaparral, lower montane coniferous forest; 3,936–8,692 ft. Southern California County Distribution: Los Angeles, San Bernardino. Blooming period: April–August	Not expected to occur; outside current known elevational range.
Galium angustifolium ssp. *gracillimum*	slender bedstraw			4.2	Perennial herb. Granitic to rocky soil in Joshua tree woodland and Sonoran desert scrub; 426–5,084 ft. Southern California County Distribution: Riverside, San Bernardino. Blooming period: April–June	Not expected to occur; no suitable habitat.
Galium grande	San Gabriel bedstraw			1B.2	Deciduous shrub. Chaparral, cismontane woodland, broadleafed upland and lower montane coniferous forest; 1,394–4,920 ft. Southern California County Distribution: Los Angeles. Blooming period: January–July	Not expected to occur; outside current known elevational range.
Galium jepsonii	Jepson's bedstraw			4.3	Perennial rhizomatous herb. Granitic, rocky, or gravelly soil in lower and upper montane coniferous forest; 5,051–8,200 ft. Southern California County Distribution: Los Angeles, San Bernardino. Blooming period: July–August	Not expected to occur; outside current known elevational range.
Galium johnstonii	Johnston's bedstraw			4.3	Perennial herb. Chaparral, lower montane coniferous forest, Pinyon and juniper woodland, riparian woodland; 4,001–7,544 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino, San Diego (Uncertain about distribution or identity). Blooming period: June–July	Not expected to occur; outside current known elevational range.
Harpagonella palmeri	Palmer's grapplinghook			4.2	Annual herb. Clay soils in chaparral, grasslands, coastal sage scrub; 65–3,132 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Diego. Blooming period: March–May	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Heuchera caespitosa	urn-flowered alumroot			4.3	Perennial rhizomatous herb. Rocky soil in montane riparian forest, cismontane woodland, lower and upper montane coniferous forest; 3,788–8,692 ft. Southern California County Distribution: Kern, Los Angeles, San Bernardino, Ventura. Blooming period: May–Au	Not expected to occur; outside current known elevational range.
Hordeum intercedens	vernal barley			3.2	Annual herb. Coastal dunes, coastal scrub, saline flats and depressions in grassland, and vernal pools; 16–3,280 ft. Southern California County Distribution: Kern, Los Angeles, Orange, Riverside, San Diego, Ventura. Blooming period: March–June	Not expected to occur; no suitable habitat.
Horkelia cuneata var. puberula	mesa horkelia			1B.1	Perennial herb. Sandy and gravelly soils in maritime chaparral, cismontane woodland, and coastal scrub; 229–2,657 ft. Southern California County Distribution: Los Angeles, Orange, Riverside (Presumed extirpated), San Bernardino, San Diego (Presumed extirpated), Ventura. Blooming period: February–July(September)	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Juglans californica	Southern California black walnut			4.2	Deciduous tree. Alluvial areas in chaparral, cismontane woodland, and coastal scrub; 164–2,952 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura. Blooming period: March–August	Documented outside the survey area during the tree inventory. Not observed within the survey area.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields			1B.1	Annual herb. Coastal salt marsh, coastal salt swamps, playas, vernal pools; 3–4,001 ft. Southern California County Distribution: Kern (Presumed extirpated), Los Angeles (Presumed extirpated), Orange, Riverside, San Bernardino (Presumed extirpated), San Diego, Ventura. Blooming period: February–June	Not expected to occur; no suitable habitat.
Lepechinia fragrans	fragrant pitcher sage			4.2	Perennial herb. Chaparral; 66–4,297 ft. Southern California County Distribution: Los Angeles, San Bernardino, Ventura (Uncertain about distribution or identity). Blooming period: March–October	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass			4.3	Annual herb. Openings in chaparral and sage scrub; below 2,900 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura. Blooming Period: January–July	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Lilium humboldtii ssp. *ocellatum*	ocellated Humboldt lily			4.2	Perennial bulbiferous herb. Openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland; 98–5,904 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura. Blooming period: March–July(August)	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Malacothamnus davidsonii	Davidson's bush-mallow			1B.2	Deciduous shrub. Chaparral, coastal scrub, cismontane and riparian woodland; 607–2,804 ft. Southern California County Distribution: Kern, Los Angeles, Ventura. Blooming period: June–January	Not expected to occur; not observed during focused surveys; suitable habitat.
Mimulus johnstonii	Johnston's monkeyflower			4.3	Annual herb. In the scree, disturbed areas, roadsides, and rocky to gravelly soils in lower montane coniferous forest; 3,198–9,578 ft. Southern California County Distribution: Los Angeles, San Bernardino. Blooming period: May–August	Not expected to occur; outside current known elevational range.
Muhlenbergia californica	California muhly			4.3	Perennial rhizomatous herb. Mesic soils and seeps and streambeds; 328–6,560 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino. Blooming period: June–September	Not expected to occur; no suitable habitat.

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IN THE SURVEY AREA VICINITY

Scientific Name	Common Name	State Status	Federal Status	CRPR	Species Background	Potential
Navarretia prostrata	prostrate vernal pool navarretia			1B.1	Annual herb. Mesic coastal scrub, meadows and seeps, alkaline grassland, and vernal pools; 49–3,968 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Bernardino (Presumed extirpated; Occurrence confirmed, but possibly extirpated), San Diego. Blooming period: April–July	Not expected to occur; no suitable habitat.
Phacelia hubbyi	Hubby's phacelia			4.2	Annual herb. Gravelly to rocky soil or talus in chaparral, coastal scrub, grassland; 0–3,280 ft. Southern California County Distribution: Kern, Los Angeles, Ventura. Blooming period: April–July	Not expected to occur; not observed during focused surveys; marginally suitable habitat.
Phacelia stellaris	Brand's star phacelia			1B.1	Annual herb. Coastal dunes, coastal scrub; 3–1,312 ft. Southern California County Distribution: Los Angeles (Presumed extirpated; Occurrence confirmed, but possibly extirpated), Orange, Riverside, San Bernardino, San Diego. Blooming period: March–June	Not expected to occur; records in the region are historic.
Pseudognaphalium leucocephalum	white rabbit-tobacco			2B.2	Perennial herb. Sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, and riparian woodland; 0–6,888 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Diego. Blooming period: July–December	Not expected to occur; no suitable soils.
Quercus durata var. *gabrielensis*	San Gabriel oak			4.2	Evergreen shrub. Chaparral and cismontane woodland; 1,476–3,280 ft. Southern California County Distribution: Los Angeles. Blooming period: April–May	Not expected to occur; not observed during focused surveys; suitable habitat.
Quercus engelmannii	Engelmann oak			4.2	Deciduous tree. Cismontane woodland, chaparral, riparian woodland, and grassland; 164–4,265 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Diego. Blooming period: March–June	Not expected to occur; not observed during focused surveys; suitable habitat.
Ribes divaricatum var. parishii	Parish's gooseberry			1A	Deciduous shrub. Riparian woodland; 213–984 ft. Southern California County Distribution: Los Angeles (Presumed extirpated), San Bernardino (Presumed extirpated). Blooming period: February–April	Not expected to occur; records in the region are historic.
Romneya coulteri	Coulter's matilija poppy			4.2	Perennial rhizomatous herb. Chaparral and coastal scrub; often in burned areas; 65–3,936 ft. Southern California County Distribution: Los Angeles, Orange, Riverside, San Diego. Blooming period: March–July	Not expected to occur; not observed during focused surveys; suitable habitat.
Rupertia rigida	Parish's rupertia			4.3	Perennial herb. Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, grassland, pavement pebble plain; 2,297–8,202 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino, San Diego. Blooming period: June–August	Not expected to occur; outside current known elevational range.
Scutellaria bolanderi ssp. *austromontana*	southern mountains skullcap			1B.2	Perennial rhizomatous herb. Moist embankments of montane creeks, mesic chaparral, mesic cismontane woodland, and mesic lower montane coniferous forest; 1,394–6,562 ft. Southern California County Distribution: Los Angeles (Presumed extirpated; Occurrence confirmed, but possibly extirpated), Riverside, San Bernardino, San Diego. Blooming period: June–August	Not expected to occur; outside current known elevational range.
Senecio astephanus	San Gabriel ragwort			4.3	Perennial herb. Rocky slopes in coastal bluff scrub and chaparral; 1,312–4,920 ft. Southern California County Distribution: Kern, Los Angeles, San Bernardino, San Diego. Blooming period: May–July	Not expected to occur; outside current known elevational range.
Sidalcea neomexicana	salt spring checkerbloom			2B.2	Perennial herb. Alkaline and mesic soils in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas; 49–5,020 ft. Southern California County Distribution: Kern, Los Angeles (Presumed extirpated), Orange, Riverside, San Bernardino, San Diego, Ventura. Blooming period: March–June	Not expected to occur; no suitable soils.
Spermolepis lateriflora	western bristly scaleseed			2A	Annual herb. Sandy or rocky Sonoran desert scrub; 1,198–2,198 ft. Southern California County Distribution: Los Angeles (Occurrence confirmed, but possibly extirpated), San Diego. Blooming period: March–April	Not expected to occur; outside current known elevational range.
Symphyotrichum defoliatum	San Bernardino aster			1B.2	Perennial rhizomatous herb. Near ditches, streams, and springs in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and vernally mesic grassland; 7–6,693 ft. Southern California County Distribution: Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego. Blooming period: July–November	Not expected to occur; no suitable habitat.
Symphyotrichum greatae	Greata's aster			1B.3	Perennial rhizomatous herb. Mesic soils in chaparral, cismontane and riparian woodland, broadleaved upland and lower montane coniferous forest; 984–6,593 ft. Southern California County Distribution: Los Angeles, San Bernardino, Ventura. Blooming period: June–October	Not expected to occur; no suitable habitat.

TABLE 2
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR
IN THE SURVEY AREA VICINITY

Scientific Name	Common Name	State Status	Federal Status	CRPR	Species Background	Potential
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern			2B.2	Perennial rhizomatous herb. Meadows, seeps, and streams; 164–2,001 ft. Southern California County Distribution: Los Angeles, Riverside, San Bernardino. Blooming period: January–September	Not expected to occur; no suitable habitat.

CRPR: California Rare Plant Rank; ft.: feet

LEGEND:

Federal Status		**State Status**	
FE	Endangered	SE	Endangered
FT	Threatened	ST	Threatened
FC	Federal Candidate for Listing		

CRPR

1A	Plants presumed extirpated in California and either rare or extinct elsewhere
1B	Plants Rare, Threatened, or Endangered in California and elsewhere
2B	Plants Rare, Threatened, or Endangered in California but more common elsewhere
3	Plants about which we need more information – A Review List
4	Plants of limited distribution – A Watch List

CRPR Threat Code Extensions

None	Plants lacking any threat information
.1	Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2	Fairly threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)
.3	Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

* Sources include CDFW 2025a, CNPS 2025, and Jepson Flora Project 2025.

Although reference populations and regional rainfall amounts were monitored to ensure the scientific adequacy of these focused surveys, there is always a minimal potential for false negative survey results as species could possibly be present on a site but may not be detectable at the time of the surveys.

Psomas appreciates the opportunity to assist on this project. If you have any comments or questions, please contact Marc Blain at 626.351.2000.

Sincerely,
PSOMAS

Marc T. Blain
Senior Project Manager, Associate Principal

Sarah Thomas
Senior Biologist

Enclosures: Exhibit 1 – Project Location
Exhibit 2 – U.S. Geological Survey 7.5-Minute Digital Quadrangle
Exhibit 3 – Vegetation Types and Other Areas
Exhibit 4 – Soils Map
Exhibit 5 – Survey Area
Attachment A – Plant Compendium

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Regional Location and Local Vicinity

Exhibit 1

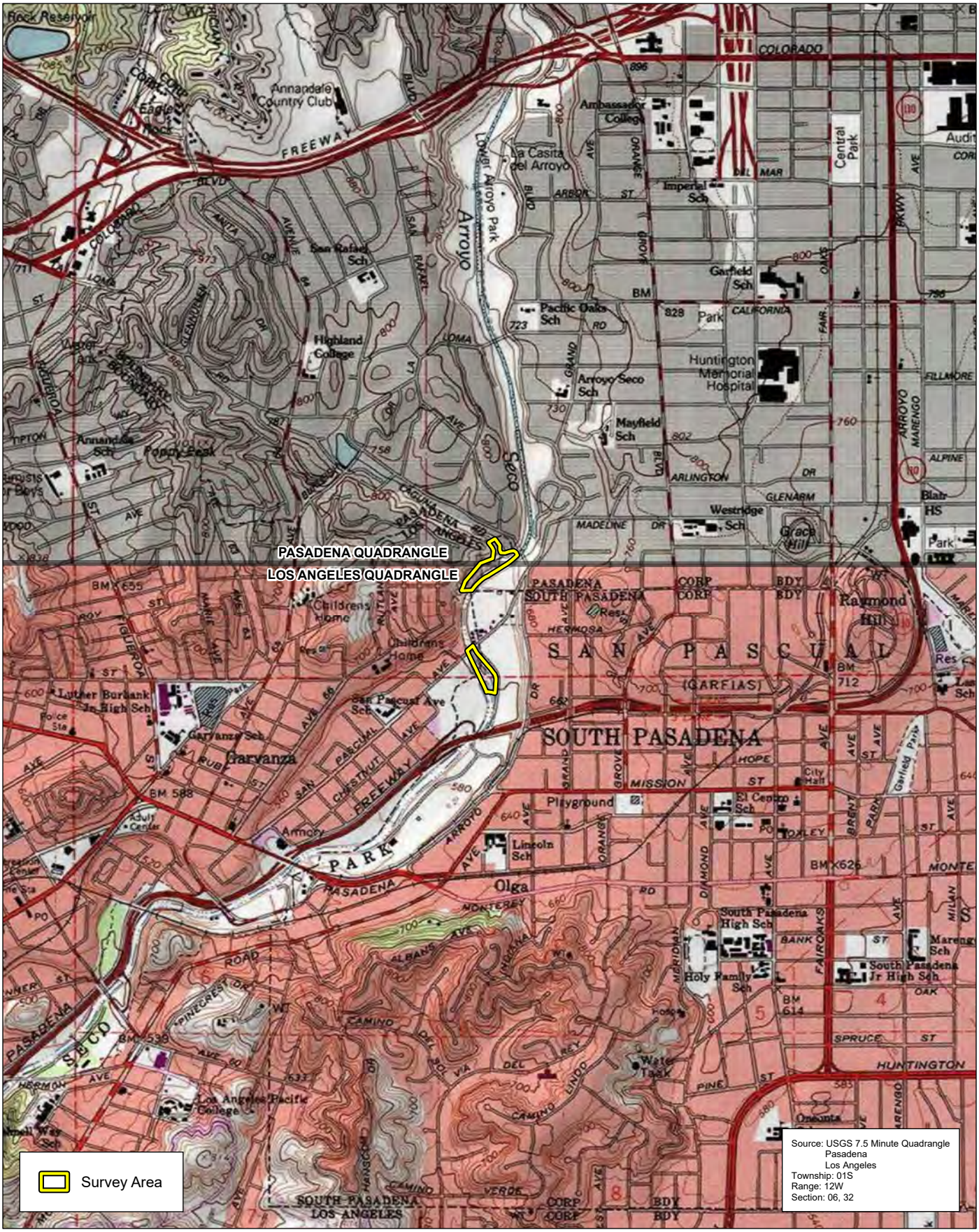
Arroyo Seco Water Reuse Project

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U.S. Geological Survey Digital Quadrangle

Exhibit 2

Arroyo Seco Water Reuse Project

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Vegetation Types and Other Areas

Exhibit 3

Arroyo Seco Water Reuse Project

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Soil Types

Exhibit 4

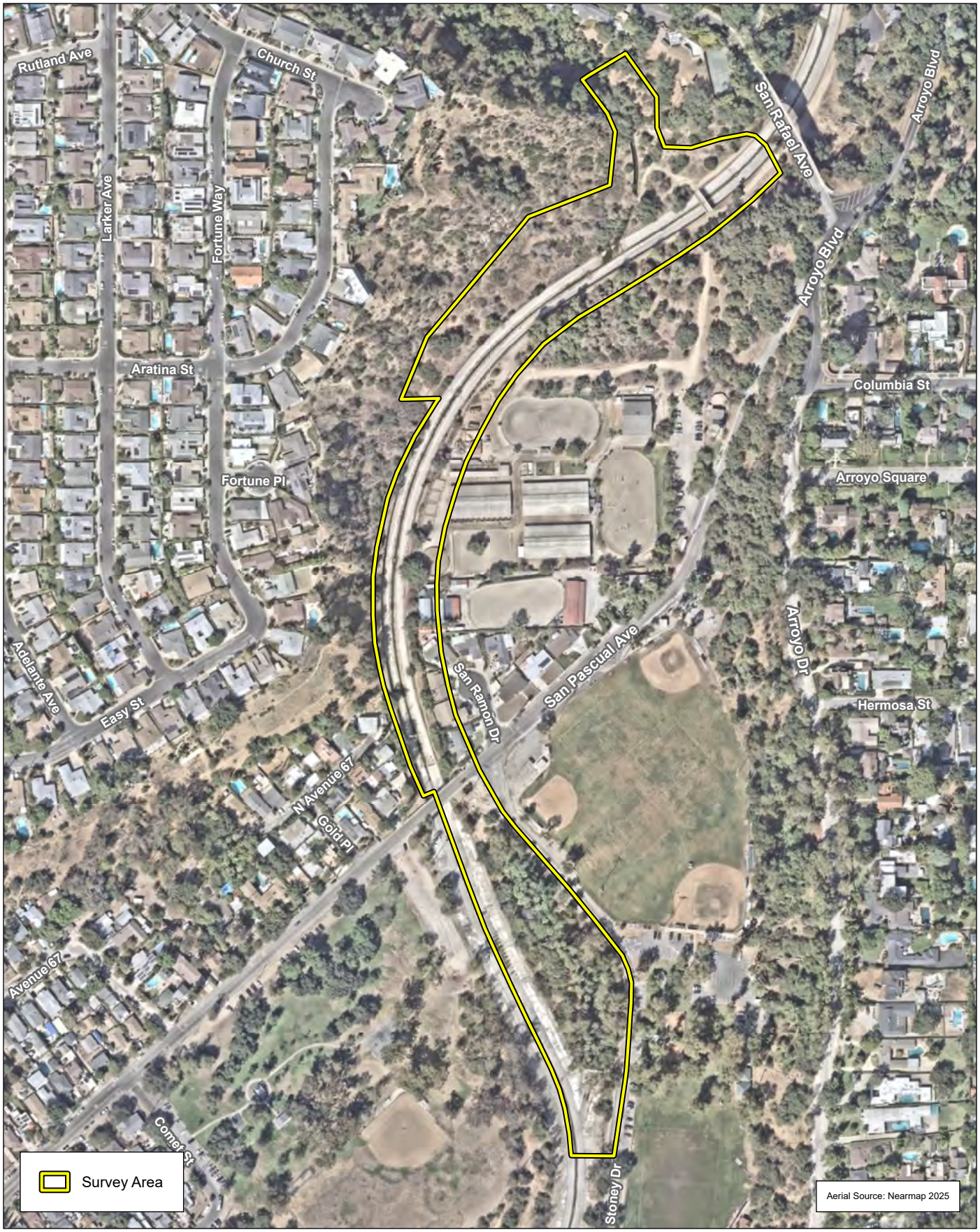
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Survey Area

Exhibit 5

Arroyo Seco Water Reuse Project

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ATTACHMENT A

PLANT COMPENDIUM

PLANT SPECIES OBSERVED ON THE PROJECT SITE DURING THE FOCUSED PLANT SURVEY

Species	
Scientific Name	**Common Name**
EUDICOTS	
ADOXACEAE – MUSKROOT FAMILY	
Sambucus nigra ssp. caerulea	blue elderberry
ANACARDIACEAE – SUMAC FAMILY	
Malosma laurina	laurel sumac
Rhus integrifolia	lemonade berry
*Schinus molle**	pepper tree
Toxicodendron diversilobum	western poison oak
ASTERACEAE – SUNFLOWER FAMILY	
Ambrosia acanthacarpa	annual bursage
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Baccharis salicifolia ssp. salicifolia	mule fat
Brickellia californica	California brickellbush
*Carduus pycnocephalus ssp. pycnocephalus**	Italian thistle
*Centaurea melitensis**	tocalote
Cirsium occidentale	cobwebby thistle
Corethrogyne filaginifolia	filago-leaved sand-aster
Erigeron canadensis	horseweed
*Lactuca serriola**	prickly lettuce
Malacothrix saxatilis	rocky malacothrix
BORAGINACEAE – BORAGE FAMILY	
Cryptantha sp.	cryptantha
Phacelia sp.	phacelia
BRASSICACEAE – MUSTARD FAMILY	
*Hirschfeldia incana**	grayish shortpod mustard
*Raphanus sativus**	radish
CRASSULACEAE – STONECROP FAMILY	
Dudleya lanceolata	lance-leaved dudleya
CUCURBITACEAE – GOURD FAMILY	
Marah macrocarpa	chilicothe
EUPHORBIACEAE – SPURGE FAMILY	
Croton setiger	turkey-mullein
*Ricinus communis**	common castor bean
FABACEAE – LEGUME FAMILY	
Acmispon glaber	deerweed
FAGACEAE – OAK FAMILY	
Quercus agrifolia	coast live oak
JUGLANDACEAE – WALNUT FAMILY	
Juglans californica	southern California black walnut (CRPR 4.2)
GERANIACEAE – GERANIUM FAMILY	
*Erodium cicutarium**	redstem filaree

PLANT SPECIES OBSERVED ON THE PROJECT SITE DURING THE FOCUSED PLANT SURVEY

Species	
Scientific Name	**Common Name**
LAMIACEAE – MINT FAMILY	
*Marrubium vulgare**	common horehound
Salvia apiana	white sage
Salvia mellifera	black sage
MALVACEAE – MALLOW FAMILY	
*Malva parviflora**	cheeseweed
NYCTAGINACEAE – FOUR O'CLOCK FAMILY	
Mirabilis laevis	smooth four o'clock
ONAGRACEAE – EVENING PRIMROSE FAMILY	
Camissoniopsis sp.	camissoniopsis
Eulobus californicus	California eulobus
PLANTAGINACEAE – PLANTAIN FAMILY	
Keckiella cordifolia	heart-leaved bush penstemon
PLATANACEAE – SYCAMORE FAMILY	
Platanus racemosa	western sycamore
POLYGONACEAE – BUCKWHEAT FAMILY	
Eriogonum fasciculatum	California buckwheat
ROSACEAE – ROSE FAMILY	
Heteromeles arbutifolia	toyon
SOLANACEAE – NIGHTSHADE FAMILY	
Datura wrightii	Wright's jimsonweed
*Nicotiana glauca**	tree tobacco
MONOCOTS	
ARECACEAE – PALM FAMILY	
*Washingtonia robusta**	Mexican fan palm
POACEAE – GRASS FAMILY	
*Avena barbata**	slender wild oat
*Bromus rubens**	red brome
*Bromus tectorum**	cheat grass
Melica imperfecta	little California melica
*Stipa miliacea var. miliacea**	smilo grass

** Non-native or invasive species*

CRPR

4 Plants of limited distribution - watch list

Threat Code Extensions

.2 Moderately threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)

APPENDIX C

TREE SURVEY REPORT

Tree Survey Report

Arroyo Seco Water Reuse Project
Cities of Pasadena, South Pasadena, and Los Angeles, California

Prepared for

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February 11, 2026

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A	Tree Data Summary

1.0 INTRODUCTION

The purpose of this report is to identify and quantify trees and assess tree impacts resulting from implementation of the Arroyo Seco Water Reuse Project (hereafter referred to as the Project) that are regulated by the Cities of Pasadena, South Pasadena, Los Angeles, and/or the *California Fish and Game Code.*

1.1 Project Location

The survey area for this report is generally centered along a portion of the Arroyo Seco Channel that begins just south of the San Rafael Avenue bridge in the City of Pasadena and extends approximately ½-mile south (downstream), near the 110 freeway overpass in the City of South Pasadena. The survey area encompasses the two discrete Project sites, construction staging areas, and adjacent areas (Exhibit 1). In addition to Pasadena and South Pasadena, the Project extends into the City of Los Angeles. The survey area is located on the U.S. Geological Survey's (USGS') Pasadena and Los Angeles 7.5-minute quadrangles of the San Bernardino Meridian at Township 1 North, Range 12 West, Section 32 and Township 1 South, Range 12 West, Section 5.

The survey area is divided into two distinct Project areas (Exhibit 2). These include: (1) the San Rafael Creek area (San Rafael site) which consists of a concrete-lined drain that conveys water from the Johnston Lake area into the Arroyo Seco Channel and (2) the San Pascual Basin area (San Pascual site) which is a densely vegetated basin that accepts flows directed from the Arroyo Seco and is located west of Arroyo Park across Stoney Drive in the City of South Pasadena.

1.2 Project Description

The proposed Project involves the diversion of stormwater runoff from San Rafael Creek into treatment wetlands that would be created in an adjacent upland area. These treatment wetlands would improve water quality and allow for soil infiltration before discharging this treated water into the Arroyo Seco. Further downstream, water would be diverted from the Arroyo Seco to water treatment facilities and infiltration basins constructed in the approximate 2.2-acre San Pascual site.

1.3 Regulatory Authority

As described above, the Project would pass through three cities that regulate impacts to trees: (1) the City of Pasadena; (2) the City of Los Angeles; and (3) the City of South Pasadena. The boundaries of these cities are represented on Exhibit 2. Additionally, the California Department of Fish and Wildlife (CDFW) regulates the removal of native trees that are associated with stream channels. The following sections summarize each city's regulations related to tree preservation and removal.



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Regional Location and Local Vicinity

Exhibit 1

Tree Survey Report for the Arroyo Seco Water Reuse Project

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Project Areas

Exhibit 2

Tree Survey Report for the Arroyo Seco Water Reuse Project

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0 100 200 Feet

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City of Pasadena

Trees that are regulated by the City of Pasadena are described in Chapter 8.52 of the Pasadena Municipal Code, hereafter referred to as the Pasadena Tree Ordinance. Under the Pasadena Tree Ordinance, public trees (in addition to native, landmark, specimen, and mature trees) are considered protected which would require approval by the City Manager. Other tree definitions that are pertinent to the resources in the survey area include native trees that have a trunk diameter at breast height (dbh) of at least 8 inches and various other non-native "specimen" trees of varying minimum sizes as provided in the Pasadena Tree Ordinance. The Pasadena Tree Ordinance also protects any tree designated as a "landmark" tree (trees having significant cultural or historical importance). Native trees that are specified in the Pasadena Tree Ordinance include California buckeye (*Aesculus californica*), white alder (*Alnus rhombifolia*), Southern California black walnut (*Juglans californica*), native oaks (coast live oak [*Quercus agrifolia*], scrub oak [*Q. berberidifolia*], canyon oak [*Q. chrysolepis*], Engelmann oak [*Q. engelmannii*], and valley oak [*Q. lobata*]), western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremonttii*), black cottonwood (*Populus trichocarpa*), arroyo willow (*Salix lasiolepis*), and California bay laurel (*Umbellularia californica*).

Tree replacement requirements for the City of Pasadena are determined by a matrix that indicates tree replacement quantities and sizes based on the size of the tree to be removed. This tree replacement matrix indicates the following:

- Trees with a dbh between 8 and 12.9 inches are to be replaced with 6 15-gallon trees or 3 24-inch box trees;
- Trees with a dbh between 13 and 18.9 inches are to be replaced with 8 15-gallon trees or 4 24-inch box trees or 2 36-inch box trees;
- Trees with a dbh between 19 and 36.9 inches are to be replaced with 8 24-inch box trees or 4 36-inch box trees;
- Trees with a dbh of at least 37 inches are to be replaced with 12 24-inch box trees or 8 36-inch box trees.

City of South Pasadena

Pursuant to Ordinance No. 2409 (Tree Ordinance) that was approved on December 17, 2025, the City of South Pasadena defines "protected trees" as the following species that have a trunk dbh of at least 4 inches: various oak species including coast live oak; California bay laurel; desert willow (*Chilopsis linearis*); Catalina ironwood (*Lyonothamnus floribundus*); western sycamore (also commonly known as California sycamore) as well as other sycamore species (*Platanus* spp.); toyon (*Heteromeles arbutifolia*); Southern California black walnut (*Juglans californica*); hollyleaf cherry (*Prunus ilicifolia*); heritage trees (trees specifically designated by the City Council as having historical value); and any other trees designated by the South Pasadena Public Works Department.

In addition to protected tree species, the Tree Ordinance defines "significant trees" as any other species that has a minimum dbh of 12 inches. Trunk dbh for multi-trunk trees is determined by combining the diameters of all trunks.

The Tree Ordinance defines "restricted trees in a fire hazard severity zone" as any species identified by the South Pasadena Public Works Department that cannot be planted in a High or Very High Fire Severity Zone.

A tree removal permit from the City of South Pasadena is required for the removal of any protected, significant, or fire hazard zone restricted trees. As part of the tree removal permit approval, replacement trees (24-inch box container) shall be provided for each protected or significant tree at a rate of 2 replacement trees for every 16-inch increment of trunk diameter of trees to be removed.

Pursuant to Chapter 34.9(d) of the Tree Ordinance, the City of South Pasadena is exempt from the provisions of the Tree Ordinance if a report is provided to the South Pasadena Public Works Director by a Certified Arborist.

City of Los Angeles

The City of Los Angeles regulates trees that are designated as "protected trees" as defined by Section 17.02 of the Los Angeles Municipal Code, hereafter referred to as the Los Angeles Native Tree and Shrub Protection Ordinance (LANTSPO). This category includes all native oak trees, Southern California black walnuts, western sycamores, California bay laurels, toyons, and blue elderberry (*Sambucus nigra* ssp. *caerulea*) that have a minimum trunk dbh of 4 inches. Additionally, the City of Los Angeles requires documentation of all trees with a minimum dbh of 8 inches (referred to as significant "non-protected" trees).

The LANTSPO requires replacement of protected tree species (15-gallon container) at a ratio of four replacement trees for each protected tree to be removed.

California Department of Fish and Wildlife

Many trees on the survey area are also subject to regulation by the *California Fish and Game Code*. The CDFW is charged with issuing Streambed Alteration Agreements that would allow for the removal of native tree species that occur within the bed, channel, or bank of any river, stream, or lake. The CDFW typically asserts jurisdiction over native trees that are at least two inches dbh and located within the riparian zone of a streambed feature. Mitigation/replacement ratios for trees within CDFW jurisdiction is based on the size of the tree dbh (i.e., mitigation ratios increase as the size of the impacted tree increases). It should be noted that many trees on the survey area are subject to regulation by both the various city tree ordinances described above and the *California Fish and Game Code.*

The CDFW's requirement for an applicant to provide replacement trees is based on the size of the trees to be removed. Smaller trees (i.e., less than eight inches) generally require replacement at a 2:1 ratio. The replacement ratio increases for larger trees with a maximum replacement ratio of 20:1 for trees greater than 36 inches dbh. The precise number of replacement trees would be dependent on negotiation with the CDFW during the permit processing period.

2.0 METHODOLOGY

Psomas Certified Arborists David Hughes (International Society of Arboriculture [ISA] Certificate WE-7752A) and Trevor Bristle (ISA Certificate WE-10233A) performed surveys throughout the survey area on February 3 and September 9, 2022. During the surveys, the location of each tree was mapped and given an individual number. Additionally, the following data were collected: trunk dbh, tree height, and canopy width. Qualitative ratings for each tree's overall health and aesthetic quality were also given.

A follow-up assessment of tree conditions was conducted by Mr. Hughes on October 20 and 22, 2025 to identify trees that were affected by several fires that burned the San Pascual site between 2023 and 2025. The follow-up assessment was also intended to identify trees that may have grown and currently meet the minimum size requirements for protection.

Collected data that represent the current condition of trees on the Project site are provided in Attachment A and described in more detail below.

2.1 Mapping

Each tree that was surveyed was mapped using a hand-held global positioning system (GPS) device. Locations were confirmed in the field by using geo-referenced field maps. Metal tags were affixed to trees in the San Pascual site, though tree numbers were simply marked on the field map for trees in other parts of the survey area since they could be easily distinguished on the field map.

2.2 Diameter

Using a diameter tape, measurements were taken at four and one-half feet above mean natural grade; multiple trunks were measured separately. For multi-trunk trees, the dbh is represented as the cumulative dbh of all the trunks. The dbh was estimated for trees that could not be safely accessed.

2.3 Height and Canopy

The height of each tree was estimated from mean natural grade to the highest branch. Also, the diameter of each tree's canopy was estimated at its widest point.

2.4 Aesthetics

Each tree assessed was inspected and compared to an archetype tree (considered excellent on all points mentioned below) of the same species. Tree aesthetics were evaluated with respect to overall form and symmetry, crown balance, branching pattern, and broken branches.

The trees were rated on a scale of 1 to 5, as follows:

1: Very Poor
2: Poor
3: Fair
4: Good
5: Excellent

2.5 Health

The health of each tree was assessed based on visual evidence of vigor, such as the amount of foliage; leaf color and size; presence of branch or twig dieback; severity of insect infestation; the presence of disease; heart rot; fire damage; mechanical damage; amount of new growth; appearance of bark; and rate of callous development over wounds. The tree's structural integrity was also evaluated with respect to branch attachment, branch placement, root health, and stability. In addition, the health assessment considered such elements as the presence of decay, weak branch attachments, and the presence of exposed roots due to soil erosion.

The trees were rated on the 1 to 5 scale, noted above.

3.0 RESULTS

A total of 212 trees were mapped in the survey area during the 2022 tree inventory[1]. The 2025 field assessment identified 17 trees that had died since 2022, along with 6 new trees that appear to have grown to meet the minimum size for protection, so that a total of 201 trees currently occur in the Project's survey area boundaries. As of 2025, trees that occur within the Project survey boundaries include 2 carob trees (*Ceratonia siliqua*), 1 Shamel ash (*Fraxinus uhdei*), 4 toyons, 16 western sycamores, 45 coast live oaks, 1 scrub oak (*Quercus berberidifolia*), 11 black willows (*Salix gooddingii*), 1 arroyo willow, 32 blue elderberries, 5 Brazilian pepper trees (*Schinus terebinthifolia*), 1 Chinese elm (*Ulmus parviflora*), and 82 Mexican fan palms (*Washingtonia robusta*). The locations of these trees are shown on Exhibits 3 and 4 and a summary of the jurisdictions in which they are found is provided in Table 1. A description of trees found within each jurisdiction is provided below.

General guidelines of expected mitigation are discussed in this section, though the final tree replacement requirements would be determined once project design is complete.

TABLE 1
SUMMARY OF TREES WITHIN THE SURVEY AREA

Tree Species		Total on Project Site	Applicable Jurisdictions			
Common Name	Botanical Name		City of Pasadena	City of South Pasadena	City of Los Angeles	CDFW
carob	*Ceratonia siliqua*	2	0	2	0	0
Shamel ash	*Fraxinus uhdei*	1	0	1	0	0
toyon	*Heteromeles arbutifolia*	4	0	4	0	4
western sycamore	*Platanus racemosa*	16	0	12	4	16
coast live oak	*Quercus agrifolia*	45	8	14	23	37
scrub oak	*Quercus berberidifolia*	1	1	0	0	1
black willow	*Salix gooddingii*	11	0	11	0	11
arroyo willow	*Salix lasiolepis*	1	0	1	0	1
blue elderberry	*Sambucus nigra ssp. caerulea*	32	19	7	6	7
Brazilian pepper	*Schinus terebinthifolia*	5	0	5	0	0
Chinese elm	*Ulmus parviflora*	1	0	1	0	0
Mexican fan palm	*Washingtonia robusta*	82	0	77	5	0
Total		**201**	**28**	**135**	**38**	**77**

CDFW: California Department of Fish and Wildlife

Please note: CDFW jurisdiction overlaps with the other jurisdictions so that the totals provided above are not necessarily additive (there are trees whose removal is regulated by a City and the CDFW).

[1] Three additional trees were mapped in 2022 that occurred outside the survey area boundary and have been removed from this report. These trees include 1 Southern California black walnut (*Juglans californica*), 1 western sycamore (*Platanus racemosa*), and 1 Brazilian pepper (*Schinus terebinthifolia*).



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Tree Locations – San Rafael Site

Exhibit 3

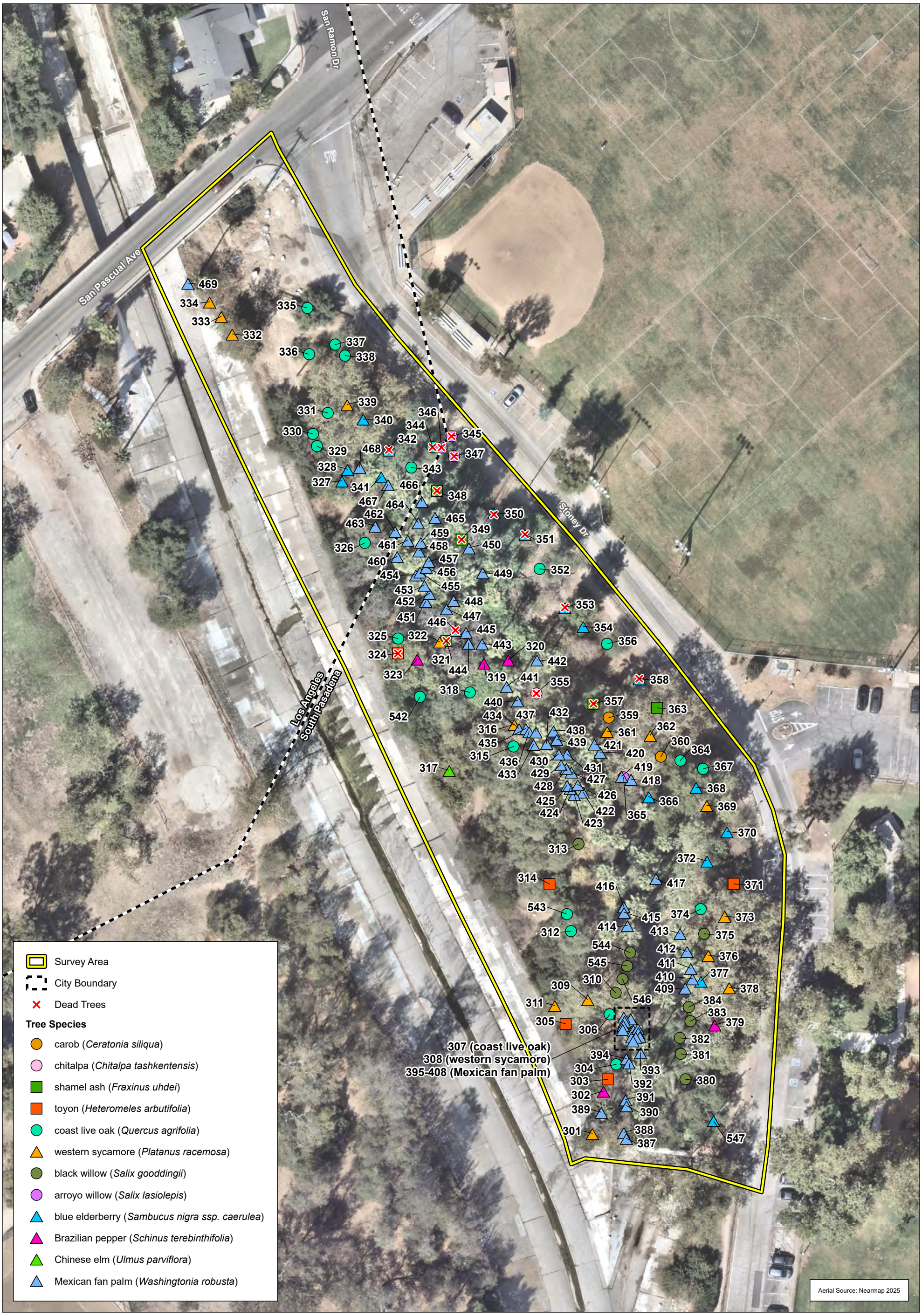
Tree Survey Report for the Arroyo Seco Water Reuse Project

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Tree Locations – San Pascual Site

Exhibit 4

Tree Survey Report for the Arroyo Seco Water Reuse Project

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PSOMAS

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As part of the updated 2025 site assessment, all fan palms within the Project area were classified as Mexican fan palm for nomenclatural consistency with the 2022 tree inventory. However, it was noted that several fan palm individuals exhibit intermediate morphological characteristics associated with California fan palm (*Washingtonia filifera*). Hybridization between these species is well documented in Southern California urban plantings. This is expected in Pasadena, where the California fan palm has historically been planted along Orange Grove Boulevard, approximately 0.5 mile from the Project area.

From an ecological standpoint, the presence of hybrid traits does not alter the biological interpretation of the resource. Whether pure Mexican fan palm or hybrids, the trees that are present at the San Pascual site occur in a planted, artificially irrigated, anthropogenic setting and do not constitute a naturally occurring native palm woodland or riparian palm oasis. In California, the California fan palm is native only to disjunct groves of the Mojave and Colorado Deserts primarily in regions such as the San Andreas Fault zone (Howard 1992). Accordingly, the presence of planted or hybrid individuals outside that natural range does not grant any of the ecological, floristic, or regulatory significance associated with native populations. Therefore, any minor taxonomic variation among individual palms does not change the conclusion that the grove provides low habitat value and does not represent a sensitive or regionally rare vegetation community.

3.1 City of Pasadena

Only the San Rafael site is located within the boundaries of the City of Pasadena (Exhibit 2). Trees found in the survey area that are subject to the Pasadena Tree Ordinance include 8 coast live oaks and 19 blue elderberries. One scrub oak is located in this Project area but does not meet the minimum size threshold for protection under the Ordinance. Surveyed trees that are within the Pasadena city limits are summarized in Table 2.

TABLE 2
SUMMARY OF TREES SURVEYED IN CITY OF PASADENA

Project Area	Tree Species		Quantity	DBH Range (in)	Height Range (ft)	Canopy Range (ft)
	Common Name	Botanical Name				
San Rafael Site	coast live oak	*Quercus agrifolia*	8	9.1–59.5	15–40	10–30
	scrub oak	*Quercus berberidifolia*	1*	2.3	9	12
	blue elderberry	*Sambucus nigra ssp. caerulea*	19	15.0–62.0	10–40	20–45
		Total	**28**			

DBH: diameter at breast height; in: inches; ft: feet
* The scrub oak does not meet the minimum size requirement for protection per the Pasadena Tree Ordinance.

3.2 City of South Pasadena

All trees described in this report that are within the City of South Pasadena boundaries occur at the San Pascual site. Surveyed trees that are within the South Pasadena city limits and subject to the South Pasadena Tree Ordinance are summarized in Table 3.

TABLE 3
SUMMARY OF TREES SURVEYED IN CITY OF SOUTH PASADENA

Project Area	Tree Species		Quantity	DBH Range (in)	Height Range (ft)	Canopy Range (ft)
	Common Name	**Botanical Name**				
San Pascual Site	***Protected Tree Species***					
	toyon	*Heteromeles arbutifolia*	4	10.2–21.5	10–20	12–15
	western sycamore	*Platanus racemosa*	12	4.2–85.2	20–60	8–40
	coast live oak	*Quercus agrifolia*	14	4.4–35.3	10–60	8–40
		Subtotal	**30**			
	Significant Tree Species					
	carob	*Ceratonia siliqua*	2	14.5–18.6	20–20	20–20
	Shamel ash	*Fraxinus uhdei*	1	15.9	45	15
	black willow	*Salix gooddingii*	2	14.0–16.5	20–35	15–18
	arroyo willow	*Salix lasiolepis*	1	24.1	25	15
	blue elderberry	*Sambucus nigra ssp. caerulea*	5	12.5–21.4	12–25	12–25
	Brazilian pepper	*Schinus terebinthifolia*	5	15.2–64.0	15–30	15–30
	Chinese elm	*Ulmus parviflora*	1	37.9	30	20
		Subtotal	**17**			
	Other Tree Species					
	black willow	*Salix gooddingii*	9	5.1–11.5	20–30	10–20
	blue elderberry	*Sambucus nigra ssp. caerulea*	2	7.0–9.5	18–20	10–12
	Mexican fan palm	*Washingtonia robusta*	77	14.0–20.0	30–60	10–12
		Subtotal	***88***			
		TOTAL	**135**			

DBH: diameter at breast height; in: inches; ft: feet

Trees that occur within the City of South Pasadena include 30 trees that meet the definition of protected species and 17 trees that are considered significant per the South Pasadena Tree Ordinance. An additional 88 trees do not meet the definition of protected or significant, either due to tree size or species.

3.3 City of Los Angeles

Portions of the survey area that are within the Los Angeles city limits include the upstream half of the San Rafael site and the northern portion of the San Pascual site. Surveyed trees that are within the Los Angeles city limits are summarized in Table 4.

TABLE 4
SUMMARY OF TREES SURVEYED IN CITY OF LOS ANGELES

Project Area	Tree Species		Quantity	DBH Range (in)	Height Range (ft)	Canopy Range (ft)
	Common Name	Botanical Name				
San Rafael Site	coast live oak	*Quercus agrifolia*	14	6.3–63.1	15–50	12–40
	blue elderberry	*Sambucus nigra ssp. caerulea*	2	11.1–29.4	15–20	12–20
		Subtotal	**16**			
San Pascual Site	western sycamore	*Platanus racemosa*	4	8.5–68.3	25–55	8–50
	coast live oak	*Quercus agrifolia*	9	6.0–30.9	12–40	8–30
	blue elderberry	*Sambucus nigra ssp. caerulea*	4	6.6–14.5	12–15	10–15
	Mexican fan palm	*Washingtonia robusta*	5*	8.0–36.0	30–60	10–12
		Subtotal	**22**			
		TOTAL	**38**			

DBH: diameter at breast height; in: inches; ft: feet
* Mexican fan palm is not a protected species per the Los Angeles Native Tree and Shrub Protection Ordinance

All trees summarized in Table 4 are considered protected species in the LANTSPO (except for Mexican fan palms) and would require replacement planting to offset their removal.

3.4 California Department of Fish and Wildlife

The CDFW typically asserts jurisdiction over native trees that are within the bed and bank of a streambed or partially overhang a streambed. In all, 77 trees were mapped in the survey area that fall within CDFW jurisdictional areas. The San Pascual site contains 77 of these trees while 22 occur at the San Rafael site. Surveyed trees that are subject to the jurisdiction of the CDFW are summarized in Table 5.

TABLE 5
SUMMARY OF TREES SURVEYED UNDER CDFW JURISDICTION

Project Area	Tree Species		Quantity	DBH Range (in)	Height Range (ft)	Canopy Range (ft)
	Common Name	Botanical Name				
San Rafael Site	coast live oak	*Quercus agrifolia*	14	6.3–37.7	15–50	12–40
	scrub oak	*Quercus berberidifolia*	1	2.3	9	12
		Subtotal	**15**			
San Pascual Site	toyon	*Heteromeles arbutifolia*	4	10.2–21.5	10–20	12–15
	western sycamore	*Platanus racemosa*	16	5.5–91.4	20–60	8–50
	coast live oak	*Quercus agrifolia*	23	4.4–35.3	10–60	8–40
	black willow	*Salix gooddingii*	11	5.1–16.5	20–35	10–20
	arroyo willow	*Salix lasiolepis*	1	24.1	25	15
	blue elderberry	*Sambucus nigra ssp. caerulea*	7	7.0–21.4	12–25	12–25
		Subtotal	**62**			
		TOTAL	**77**			

DBH: diameter at breast height; in: inches; ft: feet

4.0 TREE IMPACTS

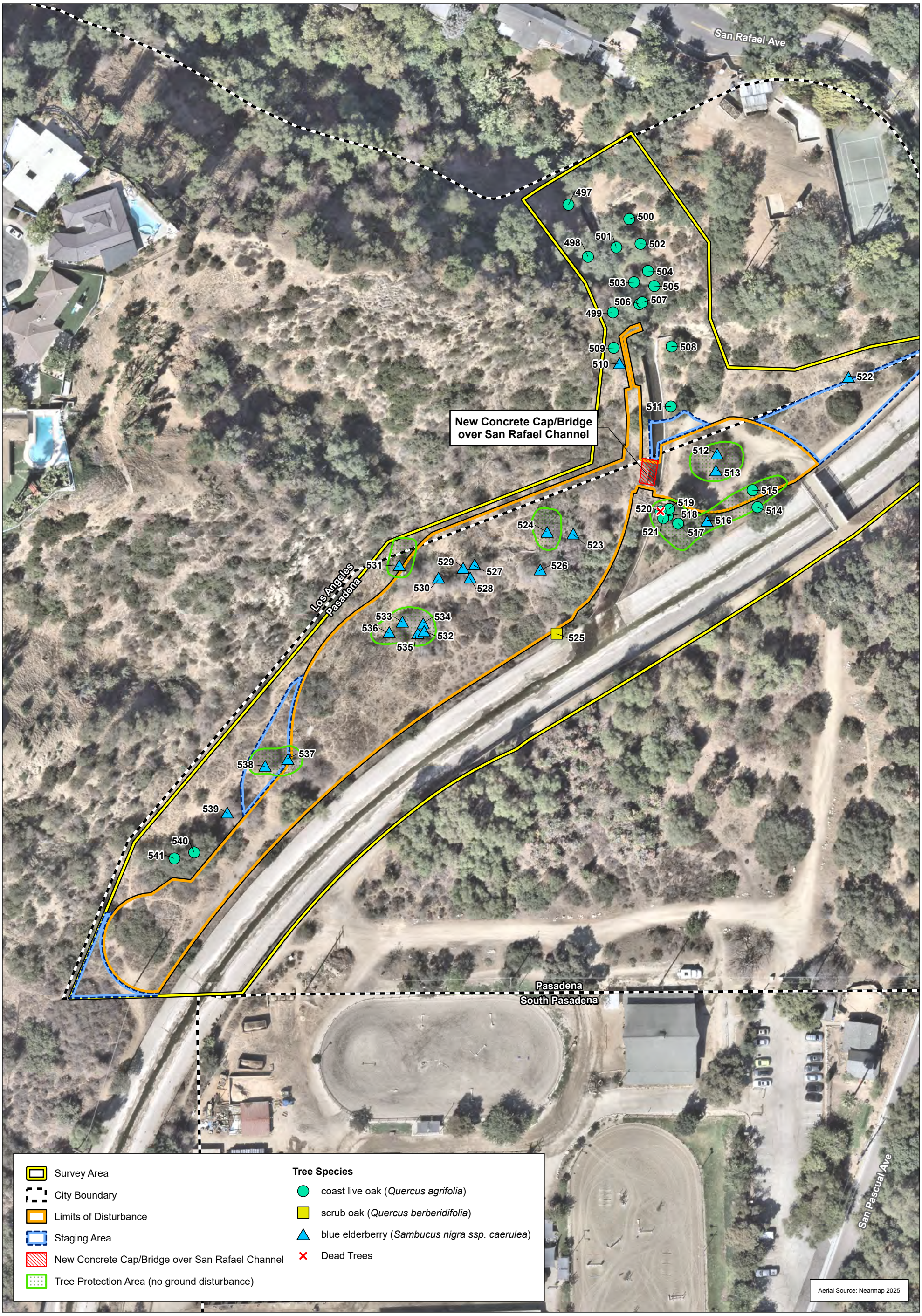
Impacts to trees with implementation of the Project would result from grading and/or general vegetation clearing to construct treatment wetlands at the San Rafael site and to install water treatment facilities at the San Pascual site.

All vegetation within the limits of disturbance shown on Exhibits 5 and 6 is expected to be removed, though there are several areas of tree avoidance where trees will be protected in place.

Trees expected to be impacted for Project implementation are summarized in Table 6. As shown, a total of 201 trees are located at the San Rafael and San Pascual sites. Of these, a total of 136 trees would be removed (6 at the San Rafael site and 130 at the San Pascual site). The 136 impacted trees consist of the following:

- 6 protected trees per the Pasadena Tree Ordinance;
- 119 trees in South Pasadena that consist of 17 protected trees and 14 significant trees per the South Pasadena Tree Ordinance along with 88 trees that do not meet either definition; and
- 6 protected trees and 5 non-protected trees per the LANTSPO

The removal of protected trees in the cities of Pasadena and Los Angeles will be offset via establishment of replacement trees according to the requirements of the respective tree ordinances. The San Pascual site will be revegetated as part of Project development though the Project is exempt from the South Pasadena Tree Ordinance replacement requirements pursuant to Chapter 34.9(d).



Tree Impacts – San Rafael Site

Exhibit 5

Tree Survey Report for the Arroyo Seco Water Reuse Project

N W E S

0 40 80 Feet

PSOMAS

(Rev: 1-16-2026 PLO) R:\Projects\PAS_Pasaden\3PAS010750\Graphics\Tree_Report\ex_Tree_Impacts.pdf

D:\Projects\2PAS\Arroyo_Seco_WR\PRO\Arroyo_Seco_WR.aprx\ex_Tree_Impacts



D:\Projects\2PAS\Arroyo_Seco_WR\PRO\Arroyo_Seco_WR.aprx\ex_Tree_Impacts

Tree Impacts - San Pascual Site

Exhibit 6

Tree Survey Report for the Arroyo Seco Water Reuse Project

N W E S

0 40 80 Feet

PSOMAS

(Rev: 1-16-2026 PLO) R:\Projects\PAS_Pasaden\3PAS010750\Graphics\Tree_Report\ex_Tree_Impacts.pdf

TABLE 6
SUMMARY OF TREE IMPACTS

Tree Species		Total Existing	Proposed for Removal	Applicable Jurisdiction(s)					
					South Pasadena			Los Angeles	CDFW
Common Name	Botanical Name			Pasadena	Protected	Significant	Other		
San Rafael Site									
coast live oak	*Quercus agrifolia*	22	0	—	—	—	—	—	—
scrub oak	*Quercus berberidifolia*	1	0	—	—	—	—	—	—
blue elderberry	*Sambucus nigra ssp. caerulea*	21	6	6	—	—	—	—	—
San Rafael Site Subtotals		**44**	**6**	**6**	**0**	**0**	**0**	**0**	**0**
San Pascual Site									
carob	*Ceratonia siliqua*	2	2	—	—	2	—	—	—
Shamel ash	*Fraxinus uhdei*	1	1	—	—	1	—	—	—
toyon	*Heteromeles arbutifolia*	4	2	—	2	—	—	—	2[b]
western sycamore	*Platanus racemosa*	16	6	—	6	—	—	—	6
coast live oak	*Quercus agrifolia*	23	11	—	9	—	—	2	11
black willow	*Salix gooddingii*	11	11	—	—	2	9	—	11
arroyo willow	*Salix lasiolepis*	1	1	—	—	1	—	—	—
blue elderberry	*Sambucus nigra ssp. caerulea*	11	8	—	—	2	2	4	8[b]
Brazilian pepper	*Schinus terebinthifolia*	5	5	—	—	5	—	—	—
Chinese elm	*Ulmus parviflora*	1	1	—	—	1	—	—	—
Mexican fan palm	*Washingtonia robusta*	82	82	—	—	—	77[a]	5[a]	—
San Pascual Site Subtotals		**157**	**130**	**0**	**17**	**14**	**88**	**11**	**38**
Project Totals		***201***	***136***	***6***	***119***			***11***	***38***

CDFW: California Department of Fish and Wildlife; —: not applicable

[a] Mexican fan palms are not a protected species per the City of Los Angeles or the City of South Pasadena and would not require replacement.

[b] Toyon and blue elderberry are typically considered large shrubs by the CDFW and may not require replacement planting.

Note: CDFW jurisdiction overlaps with the other jurisdictions so that the totals are not necessarily additive (i.e., there are trees whose removal is regulated by a city and the CDFW).

5.0 REFERENCES

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ATTACHMENT A

TREE SURVEY DATA SUMMARY

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
301	western sycamore *Platanus racemosa*	2	24.5, 18.0	42.5	35	30	3	3	X			X		X		X
302	Brazilian pepper *Schinus terebinthifolia*	1	17.0	17.0	20	20	3	3	X					X	X	
303	toyon *Heteromeles arbutifolia*	9	3.1, 3.0, 2.0, 2.0, 2.0, 1.5, 1.5, 1.5, 1.0	17.6	10	15	1	1	X			X		X	X	
304	coast live oak *Quercus agrifolia*	1	22.1	22.1	45	20	3	2	X			X		X	X	
305	toyon *Heteromeles arbutifolia*	2	5.2, 5.0	10.2	12	12	4	3	X			X		X		X
306	coast live oak *Quercus agrifolia*	1	16.6	16.6	40	20	3	3	X			X		X	X	
307	coast live oak *Quercus agrifolia*	1	8.5	8.5	30	12	2	1	X			X		X	X	
308	western sycamore *Platanus racemosa*	1	6.3	6.3	30	10	3	3	X			X		X	X	
309	western sycamore *Platanus racemosa*	3	24.1, 21.2, 19.9	65.2	60	30	4	4	X			X		X	X	
310	black willow *Salix gooddingii*	1	7.3	7.3	30	10	3	3	X			X		X	X	
311	western sycamore *Platanus racemosa*	1	8.6	8.6	20	15	3	3	X			X		X		X
312	coast live oak *Quercus agrifolia*	2	11.6, 8.5	20.1	30	20	4	3	X			X		X	X	
313	black willow *Salix gooddingii*	1	10.2	10.2	25	10	3	2	X			X		X	X	
314	toyon *Heteromeles arbutifolia*	4	3.3, 3.0, 2.0, 2.0	10.3	15	12	3	3	X			X		X	X	
315	coast live oak *Quercus agrifolia*	1	35.3	35.3	60	40	5	5	X			X		X	X	
316	western sycamore *Platanus racemosa*	5	32.2, 6.6, 5.1, 4.0, 3.5	51.4	40	20	2	2	X			X		X	X	
317	Chinese elm *Ulmus parvifloa*	4	10.9, 9.5, 9.0, 8.5	37.9	30	20	3	3	X					X	X	
318	coast live oak *Quercus agrifolia*	2	3.5, 3.2	6.7	18	8	3	3	X			X		X		X
319	Brazilian pepper *Schinus terebinthifolia*	9	7.5, 7.5, 5.5, 4.0, 3.5, 2.5, 2.0, 2.0, 2.0	36.5	20	15	2	2	X					X	X	
320	Brazilian pepper *Schinus terebinthifolia*	4	14.1, 13.8, 12.8, 11.1	51.8	30	30	3	2	X					X	X	
321	**Tree killed in recent on-site fire**															
322	western sycamore *Platanus racemosa*	1	39.4	39.4	35	30	2	2	X			X		X	X	
323	Brazilian pepper *Schinus terebinthifolia*	2	8.5, 6.7	15.2	25	15	3	2	X					X	X	
324	**Tree killed in recent on-site fire**															

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
325	coast live oak *Quercus agrifolia*	1	15.4	15.4	35	12	4	3	X			X		X		X
326	coast live oak *Quercus agrifolia*	1	21.1	21.1	30	30	2	2			X	X		X		X
327	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	4.1, 2.5	6.6	15	12	4	3			X			X	X	
328	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	6.5, 6.0, 3.3	15.8	15	10	3	3			X			X	X	
329	coast live oak *Quercus agrifolia*	1	28.1	28.1	35	30	5	4			X	X		X		X
330	coast live oak *Quercus agrifolia*	1	30.9	30.9	40	30	5	4			X	X		X		X
331	coast live oak *Quercus agrifolia*	2	13.9, 12.5	26.4	30	20	4	4			X	X		X		X
332	western sycamore *Platanus racemosa*	1	16.1	16.1	45	20	4	4			X	X		X		X
333	western sycamore *Platanus racemosa*	1	8.5	8.5	25	8	2	2			X	X		X		X
334	western sycamore *Platanus racemosa*	2	11.1, 7.5	18.6	30	15	4	4			X	X		X		X
335	coast live oak *Quercus agrifolia*	1	9.0	9.0	18	12	4	4			X	X		X	X	
336	coast live oak *Quercus agrifolia*	1	7.8	7.8	12	10	4	3			X	X		X		X
337	coast live oak *Quercus agrifolia*	1	10.1	10.1	25	12	4	4			X	X		X		X
338	coast live oak *Quercus agrifolia*	1	6.0	6.0	15	8	4	3			X	X		X		X
339	western sycamore *Platanus racemosa*	3	34.4, 22.4, 11.5	68.3	55	50	4	4			X	X		X		X
340	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	14.5	14.5	12	15	3	3			X			X	X	
341	blue elderberry *Sambucus nigra* ssp. *caerulea*	5	4.5, 4.2, 3.0, 2.0, 2.0	15.7	15	10	3	2			X			X	X	
342	**Tree killed in recent on-site fire**															
343	coast live oak *Quercus agrifolia*	1	16.2	16.2	35	18	4	4			X	X		X	X	
344	**Tree killed in recent on-site fire**															
345	**Tree killed in recent on-site fire**															
346	**Tree killed in recent on-site fire**															
347	**Tree killed in recent on-site fire**															
348	**Tree killed in recent on-site fire**															
349	**Tree killed in recent on-site fire**															
350	**Tree killed in recent on-site fire**															
351	**Tree killed in recent on-site fire**															

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
352	coast live oak *Quercus agrifolia*	1	16.6	16.6	45	20	3	2	X			X		X		X
353	**Tree killed in recent on-site fire**															
354	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	21.4	21.4	25	15	2	2	X					X	X	
355	**Tree killed in recent on-site fire**															
356	coast live oak *Quercus agrifolia*	2	5.3, 3.3	8.6	12	8	3	3	X			X		X	X	
357	**Tree killed in recent on-site fire**															
358	**Tree killed in recent on-site fire**															
359	carob *Ceratonia siliqua*	1	14.5	14.5	20	20	4	3	X					X	X	
360	carob *Ceratonia siliqua*	2	9.6, 9.0	18.6	20	20	4	3	X					X	X	
361	western sycamore *Platanus racemosa*	2	49.5, 18.2	67.7	50	35	4	4	X			X		X	X	
362	western sycamore *Platanus racemosa*	1	5.5	5.5	25	8	3	3	X			X		X		X
363	Shamel ash *Fraxinus uhdei*	1	15.9	15.9	45	15	4	3	X					X	X	
364	coast live oak *Quercus agrifolia*	1	14.9	14.9	35	15	4	4	X			X		X		X
365	arroyo willow *Salix lasiolepis*	3	10.1, 8.5, 5.5	24.1	25	15	4	2	X			X		X	X	
366	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	9.5	9.5	18	12	3	3	X					X	X	
367	coast live oak *Quercus agrifolia*	1	8.0	8.0	12	10	4	3	X			X		X		X
368	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	7.5, 5.5, 5.0	18.0	12	12	3	3	X					X		X
369	western sycamore *Platanus racemosa*	3	17.5, 15.9, 8.5, 8.0	49.9	60	35	2	2	X			X		X		X
370	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	9.5, 6.5, 5.0	21.0	20	25	3	3	X					X		X
371	toyon *Heteromeles arbutifolia*	5	8.0, 4.0, 3.5, 3.0, 3.0	21.5	20	15	3	3	X			X		X		X
372	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	6.0, 5.5, 5.0	16.5	20	15	3	3	X					X		X
373	western sycamore *Platanus racemosa*	4	22.0, 18.2, 16.6, 14.9	71.7	45	30	4	4	X			X		X		X
374	coast live oak *Quercus agrifolia*	1	5.9	5.9	20	8	4	3	X			X		X	X	
375	black willow *Salix gooddingii*	3	7.5, 6.5	14.0	20	18	3	2	X			X		X	X	
376	western sycamore *Platanus racemosa*	2	19.6, 13.0	32.6	40	25	3	3	X			X		X	X	

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
377	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	7.0	7.0	20	10	3	2	X					X	X	
378	western sycamore *Platanus racemosa*	6	36.2, 16.8, 14.5, 10.1, 8.0, 5.8	91.4	60	30	4	4	X			X		X		X
379	Brazilian pepper *Schinus terebinthifolia*	1	25.2	25.2	15	20	4	2	X					X	X	
380	black willow *Salix gooddingii*	1	16.5	16.5	35	15	4	3	X			X		X	X	
381	black willow *Salix gooddingii*	1	6.5	6.5	25	15	4	3	X			X		X	X	
382	black willow *Salix gooddingii*	1	7.0	7.0	25	15	4	3	X			X		X	X	
383	black willow *Salix gooddingii*	2	6.0, 5.5	11.5	30	20	4	3	X			X		X	X	
384	black willow *Salix gooddingii*	1	5.5	5.5	25	12	4	3	X			X		X	X	
385	**Tree removed from tree report exhibits as it occurs outside the project survey area and will be unaffected by project activities.**															
386	**Tree removed from tree report exhibits as it occurs outside the project survey area and will be unaffected by project activities.**															
387	Mexican fan palm *Washingtonia robusta*	1	16.0	16.0	40	10	4	3	X					X	X	
388	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
389	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
390	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
391	Mexican fan palm *Washingtonia robusta*	1	22.0	22.0	50	10	4	3	X					X	X	
392	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
393	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	45	10	4	3	X					X	X	
394	Mexican fan palm *Washingtonia robusta*	1	28.0	28.0	55	12	4	3	X					X	X	
395	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
396	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
397	Mexican fan palm *Washingtonia robusta*	1	22.0	22.0	50	10	4	3	X					X	X	
398	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
399	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	35	10	4	3	X					X	X	
400	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
401	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	40	10	4	3	X					X	X	
402	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
403	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
404	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
405	Mexican fan palm*Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
406	Mexican fan palm *Washingtonia robusta*	1	8.0	8.0	30	10	4	3	X					X	X	
407	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	40	10	4	3	X					X	X	
408	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
409	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
410	Mexican fan palm *Washingtonia robusta*	1	15.0	15.0	40	10	4	3	X					X	X	
411	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
412	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
413	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
414	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
415	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
416	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	60	10	4	3	X					X	X	
417	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
418	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
419	Mexican fan palm *Washingtonia robusta*	1	10.0	10.0	35	10	4	3	X					X	X	
420	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	60	10	4	3	X					X	X	
421	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
422	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
423	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
424	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
425	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
426	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
427	Mexican fan palm *Washingtonia robusta*	1	15.0	15.0	40	10	4	3	X					X	X	
428	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
429	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
430	Mexican fan palm *Washingtonia robusta*	1	20.0	20.0	50	10	4	3	X					X	X	
431	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	60	10	4	3	X					X	X	
432	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
433	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
434	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
435	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
436	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
437	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
438	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
439	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
440	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	50	10	4	3	X					X	X	
441	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
442	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
443	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
444	Mexican fan palm *Washingtonia robusta*	1	8.0	8.0	30	10	4	3	X					X	X	
445	Mexican fan palm *Washingtonia robusta*	1	8.0	8.0	30	10	4	3	X					X	X	
446	**Tree killed in recent on-site fire**															
447	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	60	10	4	3	X					X	X	

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
448	Mexican fan palm *Washingtonia robusta*	1	36.0	36.0	60	12	4	3	X					X	X	
449	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	60	10	4	3	X					X	X	
450	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3	X					X	X	
451	Mexican fan palm *Washingtonia robusta*	1	15.0	15.0	40	10	4	3	X					X	X	
452	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
453	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
454	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
455	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
456	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	40	10	4	3	X					X	X	
457	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
458	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
459	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
460	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
461	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
462	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3			X			X	X	
463	Mexican fan palm *Washingtonia robusta*	1	12.0	12.0	40	10	4	3			X			X	X	
464	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	12	4	3	X					X	X	
465	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
466	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3	X					X	X	
467	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3			X			X	X	
468	Mexican fan palm *Washingtonia robusta*	1	24.0	24.0	50	10	4	3			X			X	X	
469	Mexican fan palm *Washingtonia robusta*	1	18.0	18.0	50	10	4	3			X			X	X	
497	coast live oak *Quercus agrifolia*	1	6.6	6.6	15	12	4	4			X	X	X			X

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
498	coast live oak *Quercus agrifolia*	1	17.5	17.5	35	25	3	3			X	X	X			X
499	coast live oak *Quercus agrifolia*	4	19.6, 18.1, 13.2, 12.2	63.1	50	40	3	4			X	X	X			X
500	coast live oak *Quercus agrifolia*	1	9.0	9.0	30	18	4	4			X	X	X			X
501	coast live oak *Quercus agrifolia*	1	14.5	14.5	25	20	4	4			X	X	X			X
502	coast live oak *Quercus agrifolia*	1	8.5	8.5	20	12	4	4			X	X	X			X
503	coast live oak *Quercus agrifolia*	1	11.0	11.0	25	20	4	3			X	X	X			X
504	coast live oak *Quercus agrifolia*	1	6.3	6.3	20	12	4	3			X	X	X			X
505	coast live oak *Quercus agrifolia*	1	9.2	9.2	25	15	4	4			X	X	X			X
506	coast live oak *Quercus agrifolia*	2	8.6, 8.5	17.1	25	20	4	3			X	X	X			X
507	coast live oak *Quercus agrifolia*	1	8.9	8.9	20	15	4	4			X	X	X			X
508	coast live oak *Quercus agrifolia*	2	17.7, 8.9	26.6	25	20	3	2			X	X	X			X
509	coast live oak *Quercus agrifolia*	1	19.9	19.9	35	30	4	4			X	X	X			X
510	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	11.1	11.1	20	12	4	4			X		X			X
511	coast live oak *Quercus agrifolia*	1	8.7	8.7	15	15	3	3			X		X			X
512	blue elderberry *Sambucus nigra* ssp. *caerulea*	10	11.6, 8.9, 8.0, 6.5, 6.0, 5.0, 4.0, 4.0, 4.0, 4.0	62.0	18	30	3	2		X			X			X
513	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	12.4, 10.6	23.0	20	20	3	3		X			X			X
514	coast live oak *Quercus agrifolia*	1	18.4	18.4	30	20	4	4		X		X	X			X
515	coast live oak *Quercus agrifolia*	2	4.8, 4.3	9.1	20	10	3	3		X			X			X
516	blue elderberry *Sambucus nigra* ssp. *caerulea*	9	14.4, 6.2, 6.0, 4.5, 4.0, 4.0, 4.0, 3.0, 3.0	49.1	20	25	3	2		X			X			X
517	coast live oak *Quercus agrifolia*	5	14.4, 12.6, 12.4, 11.8, 8.3	59.5	30	25	4	4		X			X			X
518	coast live oak *Quercus agrifolia*	2	17.9, 15.8	33.7	40	30	4	4		X			X			X
519	coast live oak *Quercus agrifolia*	2	10.6, 4.1	14.7	15	15	3	2		X			X			X
520	**Dead tree, toppled by recent high winds**															
521	coast live oak *Quercus agrifolia*	1	12.2	12.2	35	20	4	3		X			X			X

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
522	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	11.8, 10.5, 7.1	29.4	15	20	3	3			X		X			X
523	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	12.4, 5.5, 5.1	23.0	40	30	3	3		X			X		X	
524	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	13.8, 5.6	19.4	40	35	3	3		X			X			X
525	scrub oak *Quercus berberidifolia*	1	2.3	2.3	9	12	4	4		X		X	X			X
526	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	9.6, 5.7	15.3	10	25	3	3		X			X		X	
527	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	21.1	21.1	25	30	3	3		X			X		X	
528	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	15.1	15.1	30	20	3	3		X			X		X	
529	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	13.9, 6.2	20.1	30	25	3	3		X			X		X	
530	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	12.4, 12.2, 6.8	31.4	30	30	3	3		X			X		X	
531	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	15.8	15.8	30	25	3	3		X			X			X
532	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	15.0	15.0	20	25	1	1		X			X			X
533	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	16.8	16.8	25	30	3	3		X			X			X
534	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	13.9, 7.1	21.0	30	25	3	3		X			X			X
535	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	14.8, 9.8	24.6	25	45	3	3		X			X			X
536	blue elderberry *Sambucus nigra* ssp. *caerulea*	2	12.5, 10.0	22.5	15	30	3	3		X			X			X
537	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	18.5	18.5	25	30	2	2		X			X			X
538	blue elderberry *Sambucus nigra* ssp. *caerulea*	1	22.8	22.8	15	25	1	1		X			X			X
539	blue elderberry *Sambucus nigra* ssp. *caerulea*	4	19.5, 15.1, 14.4, 4.5	53.5	30	30	2	2		X			X			X
540	coast live oak *Quercus agrifolia*	1	14.6	14.6	35	30	4	4		X			X			X
541	coast live oak *Quercus agrifolia*	1	15.7	15.7	35	40	4	4		X			X			X
542	coast live oak *Quercus agrifolia*	1	7.1	7.1	20	10	3	3	X			X		X	X	
543	coast live oak *Quercus agrifolia*	1	4.4	4.4	10	8	3	3	X			X		X	X	
544	black willow *Salix gooddingii*	1	5.2	5.2	20	10	3	2	X			X		X	X	

TABLE A-1
SUMMARY OF TREE DATA

Tree No.	Tree Species	# Main Trunks	DBH (in)	Sum of Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Jurisdiction				Project Area		Impact/Disposition	
									South Pasadena	Pasadena	Los Angeles	CDFW	San Rafael Site	San Pascual Site	Removal	Protect In Place
545	black willow *Salix gooddingii*	1	5.1	5.1	25	12	4	3	X			X		X	X	
546	black willow *Salix gooddingii*	1	6.2	6.2	25	12	4	3	X			X		X	X	
547	blue elderberry *Sambucus nigra* ssp. *caerulea*	3	6.5, 6.0, 5.0	17.5	20	25	3	3	X					X	X	

Aesthetics/Health Rating: 1=Very Poor, 2=Poor, 3=Fair, 4=Good, and 5=Excellent

DBH: diameter at breast height; in: inches; ft: feet; CDFW: California Department of Fish and Wildlife

Please note: an earlier version of this report showed Tree No. 542 as a Southern California black walnut (*Juglans californica*). This tree was determined to occur outside the project survey boundary and would be unaffected by project activities and was removed. Tree number 542 was reassigned to recently identified coast live oak at the San Pascual site.

Appendix D

Cultural and Paleontological Resources Records Searches

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

November 24, 2021

Psomas

Attn: Charles Cisneros

re: Paleontological resources for Project 3PAS010750

Dear Charles:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the 3PAS010750 project area as outlined on the portion of the Los Angeles and Pasadena USGS topographic quadrangle map that you sent to me via e-mail on November 23, 2021. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County.

Locality Number	Location	Formation	Taxa	Depth
LACM VP CIT424	Near intersection of Burleigh Rd and Avenue 64	Topanga Formation	Herring (*Ganolytes*), perch-like fish (*Thyrsocles*), ray-finned fish (*Etringus*), and other unspecified fish	Unknown
LACM IP 2542	838 Lyndon Street; South Pasadena	Topanga Formation	Mantis shrimp (Squillidae)	Surface
LACM VP CIT342	Sparkletts property near 45th & Lincoln in Highland Park	Unrecorded (Pleistocene)	Mammoth (*Mammuthus*), Bison (*Bison*)	14 feet bgs
LACM VP 1023, 2032	Workman & Alhambra Sts	Unknown Formation (Pleistocene)	sabertooth cat (*Smilodon*), horse (*Equus*), deer (*Odocoileus*), Turkey (*Meleagris*), mastodon (*Mammut*)	Unknown (excavations for storm drains)
LACM VP 3250	Madison & Middlebury Streets	Unrecorded (Pleistocene)	Mammoth (*Mammuthus*)	8 feet bgs
LACM VP 3363	W of Monterey Pass Road in Coyote Pass; E of the Long	Unknown Formation (Pleistocene; sand and silt)	Horse (*Equus*)	Unknown

	Beach Freeway & S of the N boundary of Section 32; Monterey Park

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the Natural History Museum of Los Angeles County ("NHMLA"). It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,



Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

ReportNum	DocAddlCitLetter	Status	OtherIDs	Xrefs	Authors	CitYear	CitMonth	CitTitle	CitPublisher	CitPages
LA-00112					D'Altroy, Terence N.	1974		Impact on Archaeological Resources of Proposed Upgrading Ramps on the Pasadena Freeway	University of California, Los Angeles Archaeological Survey	4
LA-00115					Clewlow, William C. Jr.	1974		Evaluation of the Archaeological Resources and Potential Impact of Proposed Extension of the Long Beach Freeway (rt. 7) North From Valley Blvd. to Rt. 210 (colorado Freeway)	University of California, Los Angeles Archaeological Survey	
LA-03497					Anonymous	1994		Draft Supplemental Environmental Impact Report Pasadena-Los Angeles Light Rail Transit Project	Tetra Tech, Inc.	25
LA-03498					Anonymous	1994		Final Supplemental Environmental Impact Report Pasadena-Los Angeles Light Rail Transit Project	Tetra Tech, Inc.	216
LA-03498	A				Saurenman, Hugh			Evaluation of Change in Noise Impacts, Proposed Blue Line Wayside Horn System	Harris Miller Miller & Hanson Inc	24
LA-04216					Holmes, William Henry	1900		Report of the US National Museum Under the Direction of the Smithsonian Institute for the Year Ending June 30, 1900	The Smithsonian Institute	
LA-04386					Anonymous	1993		Cultural Resources Overview Los Angeles County Metropolitan Transportation Authority's Interstate Commerce Commission Abandonment Exemption Pasadena-Los Angeles Light Rail Transit Project	Caltrans	28
LA-04890					Storey, Noelle	2000		Negative Archaeological Survey Report, Highway Project Description	Caltrans District 7	
LA-04909					Atchley, Sara M.	2000		Cultural Resources Investigation for the Nextlink Fiber Optic Project, Los Angeles and Orange Counties, California	Jones & Stokes	
LA-06334					Kinkella, Andrew	2002		Below the Basketball Court: Burial Recovery at Arroyo Seco Park	Greenwood and Associates	
LA-06362					Borg, Roger	1994		Finding of Effect on Historic Properties Arroyo Seco Parkway and Four Level Interchange	Caltrans District 7	35
LA-06385					McAvoy, Christy J.	2001		Section 106 Review for 5568 Via Marison Avenue Arroyo Seco Park Historic District Los Angeles, Ca	Historic Resources Group	3
LA-06835					Harper, Caprice D.	2003		Cultural Resource Assessment Cingular Wreless Facility No. Vy311-01 South Pasadena, Los Angeles County, California	LSA Associates, Inc.	
LA-06839					Hale, Alice E.	2003		Burial Data Summary Arroyo Seco/san Pascual Park Los Angeles, California	Greenwood and Associates	
LA-07542					Wlodarski, Robert J.	2006		Bechtel Corporation Wireless Telecommunications Site Lsanca0335-c (avenue 64 & La Loma Road) Located at 940 Avenue 64, Pasadena, Los Angeles County, California 90042	Cellular, Archaeological Resource, Evaluations	
LA-07553					Fulton, Terri	2004		Cultural Resource Assessment Cingular Wireless Facility No. Vy 311-01 South Pasadena, Los Angeles County, California	LSA Associates, Inc.	
LA-08252					Snyder, John W., Mikesell, Stephen, and Pierzinski	1986		Request for Determination of Eligibility for Inclusion in the National Register of Historic Places/Historic Bridges in California: Concrete Arch, Suspension, Steel Girder and Steel Arch	Caltrans	
LA-08634					Anonymous	2007		Cultural Resources Study of the Arroyo Seco Park Project, Royal Street Communications Site No. La0108b, Stoney Drive, South Pasadena, Los Angeles County, California 91030	Historic Resource Associates	
LA-08928					McKenna, Jeanette A.	2007		A Phase I (ceqa) and Class Iii (nepa) Cultural Resources Investigation for the Lower Arroyo Seco Trail and Trailhead Improvements Project Area in the City of Pasadena, Los Angeles County, California	McKenna et al.	75
LA-09098					Bonner, Wayne H.	2006		Extended Phase I Testing for Cingular Wireless Facility Candidate 950-014-198e/lsanca0336 (arroyo Park) Arroyo Seco Park, South Pasadena, Los Angeles County, California	Michael Brandman Associates	

ReportNum	DocAddlCitLetter	Status	OtherIDs	Xrefs	Authors	CitYear	CitMonth	CitTitle	CitPublisher	CitPages
LA-09099					Bonner, Wayne H.	2005		Cultural Resources Records Search Results and Site Visit for Cingular Wireless Site 950-014-198e (city Park) Arroyo Park, Near Intersection of Comet Street and Pasqual Avenue, South Pasadena, Los Angeles County, California	Michael Brandman Associates	
LA-09489					Lee, Portia	2003		Arroyo Seco Parkway Historic District	California Archives	51
LA-09601					Bonner, Wayne H.	2008		Cultural Resources Records Search and Site Visit Results for AT&T Candidate SV0061-01 (OG Park), 820 El Centro Street, South Pasadena, Los Angeles County, California.	Michael Brandman Associates	18
LA-10541			OHP PRN - FHWA040514A		Dolan, Christy and Monica Strauss	2005		Finding of Effect for the Proposed Arroyo Seco Bike Path, Los Angeles County, California	EDAW, Inc.	169
LA-10541	A				Monica Strauss and Christy Dolan	2003	Dec	Historic Property Survey Report Proposed Arroyo Seco Bike Path County Of Los Angeles, California	EDAW	15
LA-10541	B				Monica Strauss and Christy Dolan	2003	Dec	Arroyo Seco Bike Path Historic Resources Evaluation Report HRER - Appendix 1	EDAW	185
LA-10541	C				OHP - Steve Mikesell acting SHPO	2004	Jun	HPSR / Determinations of Eligibility for Arroyo Seco Bike Path Project	Caltrans	4
LA-10713					Bonner, Wayne	2010		Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate IE05381C (R.O.W. Pole #10123PBM), 1098 South Arroyo Boulevard, Pasadena, Los Angeles County, California	Michael Brandman Associates	25
LA-10866					Supernowicz, Dana	2007		Cultural Resources Study of the Arroyo Seco Park Project Royal Street Communications Site No. LA0108B, Stoney Drive, South Pasadena, Los Angeles County, California 91030	Historic Resource Associates	68
LA-11231					Meiser, M.K.	2009		Historic American Engineering Record Arroyo Seco Flood Control Channel, Los Angeles County, California	EDAW, Inc.	42
LA-11529					Castanon, David	2008		Arroyo Seco Channel Project in the cities of Los Angeles and Pasadena, Los Angeles County, California	Department of the Army	39
LA-12422					Tibbit, Casey and Goodwin, Riordan	2013		Cultural Resources Assessment Arroyo Seco Pedestrian and Bicycle Path Project Cities of South Pasadena and Los Angeles Los Angeles County, California	Lsa	35
LA-13148					Comeau, Brad	2013		Initial Study/Mitigated Negative Declaration Sewer Rehabilitation and Replacement Project	DUDEK	43

ReportNum	CitMaps	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps	Address
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LA-00115		Archaeological, Field study						0	No	Los Angeles	LOS ANGELES	
LA-03497		Management/planning	unknown	Not for publication	No	Mapped to LA-4386 and railroad tracks marked on USGS quad maps.		0	No	Los Angeles	LOS ANGELES, MT WILSON, PASADENA	
LA-03498		Management/planning	unknown	Not for publication	No	Mapped to LA-4386 and railroad tracks marked on USGS quad maps.		0	No	Los Angeles	LOS ANGELES, MT WILSON, PASADENA	
LA-03498		Other research			No							
LA-04216		Other research				Map to Buena Vista Street		0	No	Los Angeles	LOS ANGELES	
LA-04386		Architectural/historical	Unknown	Unrestricted	No			0	No	Los Angeles	LOS ANGELES	
LA-04890		Literature search	~ 1.25 miles					0	No	Los Angeles	LOS ANGELES	
LA-04909		Archaeological, Field study	5.5 li mi					0	No	Los Angeles	ANAHEIM, BURBANK, HOLLYWOOD, LOS ANGELES, NEWPORT BEACH, PASADENA, TUSTIN	
LA-06334		Monitoring	0					0	No	Los Angeles	LOS ANGELES	
LA-06362		Other research	6 li mi					0	No	Los Angeles	HOLLYWOOD, LOS ANGELES	
LA-06385		Architectural/historical, Evaluation	Unknown				19-189325, 19-189326	2	No	Los Angeles	LOS ANGELES	
LA-06835		Archaeological, Field study	.25 ac					0	No	Los Angeles	LOS ANGELES	
LA-06839		Archaeological, Other research	Unknown			19-000224,19-000026,19-001575H,56-000058,56-000003,56-000110 mentioned in report as near	19-003057	1	No	Los Angeles	LOS ANGELES	
LA-07542		Archaeological, Field study	<.25 ac					0	No	Los Angeles	LOS ANGELES	
LA-07553		Archaeological, Field study	~.25 ac			19-003057 is within 1/2 mile		0	No	Los Angeles	LOS ANGELES	
LA-08252		Architectural/historical, Evaluation, Other research						0	No	Los Angeles	HOLLYWOOD, LOS ANGELES, PASADENA	
LA-08634		Other research	< 1 ac				19-003057	1	No	Los Angeles	LOS ANGELES	
LA-08928		Archaeological, Field study	< 2.5 ac				19-003057, 19-180037	2	No	Los Angeles	PASADENA	
LA-09098		Excavation	< 1 ac				19-003057	1	No	Los Angeles	LOS ANGELES	

ReportNum	CitMaps	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals	Counties	Maps	Address
LA-09099		Archaeological, Field study	< 1 ac				19-003057	1	No	Los Angeles	LOS ANGELES	
LA-09489		Architectural/historical, Evaluation					19-179645	1	No	Los Angeles	LOS ANGELES	
LA-09601		Archaeological, Field study					19-003057	1	No	Los Angeles	LOS ANGELES	820 El Centro Street South Pasadena
LA-10541		Archaeological, Field study		Not for publication	No		19-003100, 19-003101, 19-003102, 19-186110, 19-186721, 19-186858, 19-186859	7	No	Los Angeles	LOS ANGELES, PASADENA	
LA-10541		Architectural/Historical, Field study										
LA-10541		Architectural/Historical, Field study										
LA-10541		Evaluation										
LA-10713		Archaeological, Field study		Not for publication	No		19-150107, 19-150368, 19-150369, 19-150370, 19-150371, 19-150372, 19-150373, 19-150374, 19-150375, 19-150376, 19-150377, 19-150378, 19-150379, 19-184979, 19-186859	15	No	Los Angeles	PASADENA	1098 South Arroyo Boulevard Pasadena
LA-10866		Archaeological, Field study		Not for publication	No		19-003057, 19-179332, 19-179484, 19-179645, 19-186859	5	No	Los Angeles	LOS ANGELES	South Pasadena
LA-11231		Architectural/historical, Evaluation		Not for publication	No		19-186859	1	No	Los Angeles	LOS ANGELES, PASADENA	
LA-11529		Architectural/historical, Evaluation					19-186859	1	No	Los Angeles	LOS ANGELES	
LA-12422		Archaeological, Field study					19-190613	1	No	Los Angeles	LOS ANGELES	
LA-13148		Archaeological, Architectural/Historical, Field study		Not for publication	No			0	No	Los Angeles	LOS ANGELES	

PrimaryString	TrinomialString	ResourceName	Status	OtherIDs	Xrefs	ResType	Age	InfoBase	Attribs
P-19-003057	CA-LAN-003057	Arroyo Seco / San Pascual Site		Resource Name - Arroyo Seco / San Pascual Site		Site	Prehistoric	Other	AP02; AP09

PrimaryString	ResourceDisclosure	ResourceCollections	AccessionNo	CollectionsFacility	ResourceNotes	RecordingEvents	Reports	CountyName	Maps
P-19-003057	Not for publication	Yes				2002 (John M. Foster, Greenwood & Associates)	LA-06839, LA-08634, LA-08928, LA-09098, LA-09099, LA-09601, LA-10866	Los Angeles	LOS ANGELES

PrimaryString	Address	PLSS	UTM
P-19-003057	Los Angeles		

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California State University, Fullerton
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657.278.5395 / FAX 657.278.5542
sccic@fullerton.edu
California Historical Resources Information System
Orange, Los Angeles, and Ventura Counties

1/18/2022 Records Search File No.: 23096.9237

Charles Cisneros
Psomas
625 South Lake Avenue
Pasadena CA 91101

Re: Records Search Results for the 3PAS010750_SF Project

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the Pasadena and Los Angeles, CA USGS 7.5' quadrangles. Due to the COVID-19 emergency, we have temporarily implemented new records search protocols. With the exception of some reports that have not yet been scanned, we are operationally digital for Los Angeles, Orange, and Ventura Counties. See attached document for your reference on what data is available in this format. The following reflects the results of the records search for the project area and a ½-mile radius:

As indicated on the data request form, the locations of archaeological resources and reports are provided in the following format: ☐ custom GIS maps ☒ shape files ☐ hand drawn maps

Archaeological resources within project area: 0	None
Archaeological resources within ½-mile radius: 1	SEE ATTACHED LIST
Non-archaeological resources within project area: 3	19-186859, 19-189325, 19-190590
Reports within project area: 7	LA-06334, LA-06385, LA-08252, LA-08928, LA-10541, LA-11231, LA-11529
Reports within ½-mile radius: 22	SEE ATTACHED LIST

Resource Database Printout (list):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database (spreadsheet):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (list):	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database (spreadsheet):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed

OHP Built Environment Resources Directory (BERD) 2019: ☒ available online; please go to https://ohp.parks.ca.gov/?page_id=30338

Archaeo Determinations of Eligibility 2012: ☐ enclosed ☐ not requested ☒ nothing listed

Los Angeles Historic-Cultural Monuments ☐ enclosed ☒ not requested ☐ nothing listed

Historical Maps: ☐ enclosed ☒ not requested ☐ nothing listed

Ethnographic Information: ☒ not available at SCCIC

Historical Literature: ☒ not available at SCCIC

GLO and/or Rancho Plat Maps: ☒ not available at SCCIC

Caltrans Bridge Survey: ☒ not available at SCCIC; please go to http://www.dot.ca.gov/hq/structur/strmaint/historic.htm

Shipwreck Inventory: ☒ not available at SCCIC; please go to http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp

Soil Survey Maps: (see below) ☒ not available at SCCIC; please go to http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,

Michelle Galaz
Assistant Coordinator

Enclosures:

(X) Emergency Protocols for LA, Orange, and Ventura County BULK Processing Standards – 2 pages

(X) GIS Shapefiles – 30 shapes

(X) Resource Digital Database (spreadsheet) – 1 line

(X) Report Digital Database (spreadsheet) – 29 lines

(X) Resource Record Copies – (archaeological and non-archaeological resources within project area) – 266 pages

(X) Report Copies – (within project area) – 441 pages

(X) Invoice #23096.9237

Emergency Protocols for LA, Orange, and Ventura County BULK or SINGLE PROJECT Records Searches IF YOU HAVE A GIS PERSON ON STAFF ONLY!!

These instructions are for qualified consultants with a valid Access and Use Agreement.
WE ARE ONLY PROVIDING DATA THAT IS ALREADY DIGITAL AT THIS TIME. SAN BERNARDINO COUNTY IS NOT DIGITAL AND THESE INSTRUCTIONS DO NOT APPLY.

Some of you have a fully digital operation and have GIS staff on board who can process a fully digital deliverable from the Information Center. IF you can accept shape file data and do not require a custom map made for you by the SCCIC, and you are willing to sort the data we provide to you then these instructions are for you. Read further to be sure. You may have only one project at this time or some of you have a lot of different search locations that can be processed all at once. This may save you a lot of time getting results back and if we process your jobs in bulk, and you may enjoy significant cost savings as well. If you need individual invoice or summaries for each search location, then bulk processing is not for you and you need to submit a data request form for each search location.

Bulk processing will work for you if you have a GIS person on staff who can sort bulk data for you and make you any necessary project maps. This type of job can have as many job locations as you want but the point is that we will do them in bulk – at the same time - not one at a time. We send all the bulk data back to you and you sort it. This will work if you need searches in LA, Orange, or Ventura AND if they all have the same search radius and if all the other search criteria is the same– no exceptions. This will not work for San Bernardino County because we are not fully digital for San Bernardino County. You must submit all your shape files for each location at the same time and this will count as one search. If you have some that need a different radius, or different search criteria, then you should submit that job separately with its own set of instructions.

INSTRUCTIONS FOR BULK PROCESSING:

Please send in your requests via email using the data request form along with the associated shape files and pdf maps of the project area(s) at 1-24k scale. PDFs must be able to be printed out on 8.5X 11 paper. We check your shape file data against the pdf maps. This is where we find discrepancies between your shape files and your maps. This is required.

Please use this data request form and make sure you fill it out properly.
http://web.sonoma.edu/nwic/docs/CHRISDataRequestForm.pdf

DELIVERABLES:

1. A copy of the Built Environment Resources Directory or BERD for Los Angeles, Orange, Ventura, or San Bernardino County can now be found at the OHP Website for you to do your own research. This replaces the old Historic Properties Directory or HPD. We will not be searching this for you at this time but you can search it while you are waiting for our results to save time.

   You will only get shapefiles back, which means that you will have to make your own maps for each project location. WARNING! If you don't request the shape files, you won't be able to tell which reports are in the project area or the search radius. Please note that you are charged for

each map feature even if you opt out of receiving shape files. You cannot get secondary products such as bibliographies or pdfs of records in the project area or search radius if you don't pay for the primary products (shape files) as this is the scaffolding upon which the secondary products are derived. If you do not understand the digital fee structure, ask before we process your request and send you data. You can find the digital fee structure on the OHP website under the CHRIS tab. In order to keep costs down, you must be willing to make adjustments to the search radius or what you are expecting to receive as part of the search. Remember that some areas are loaded with data and others are sparse – our fees will reflect that.

2. You will get a bulk processed bibliographies for resources and reports as selected; you will not get individual bibliographies for each project location.

3. You will get pdfs of resources and reports if you request them, provided that they are in digital formats. We will not be scanning records or reports at this time.

4. You will get one invoice for the bulk data processing. We can't bill this as individual jobs on separate invoices for you. If there are multiple project names, we are willing to reference all the job names on the invoice if needed. If there a lot of job id's we may ask you to send them in an email so that we can copy and paste it into the invoice details. If you need to bill your clients for the data, you can refer to our fee schedule on the OHP website under the CHRIS tab and apply the fees accordingly.

5. We will be billing you at the staff rate of $150 per hour and you will be charged for all resources and report locations according to the CHRIS Fee Structure. ($12 per GIS shape file; 0.15 per pdf page, or 0.25 per excel line; quad fees will apply if your research includes more than 2 quads). Discounts offered early on in our Covid-19 response will no longer be offered on any records searched submitted after October 5th, 2020.

6. Your packet will be sent to you electronically via Dropbox. We use 7-zip to password protect the files so you will need both on your computers. We email you the password. If you can't use Dropbox for some reason, then you will need to provide us with your Fed ex account number and we will ship you a disc with the results. As a last resort, we will ship on a disc via the USPS. You may be billed for our shipping and handling costs.

I may not have been able to cover every possible contingency in this set of instructions and will update it if necessary. You can email me with questions at sccic@fullerton.edu

Thank you,

Stacy St. James
South Central Coastal Information Center

Los Angeles, Orange, Ventura, and San Bernardino Counties

Appendix E-1

Hydrology and Hydraulics Report



HYDROLOGY AND HYDRAULICS REPORT
SAN RAFAEL TREATMENT BASIN STORMWATER CAPTURE PROJECT

January 10, 2023

PRESENTED BY

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San Diego | Los Angeles
Tel 805.729.0943
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DRAFT

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1.0 INTRODUCTION

The Upper Los Angeles River Watershed is a largely built-out, urbanized watershed of approximately 485 square miles, or 310,400 acres. Runoff from this watershed drains to over 50 linear miles of the LA River. One major tributary to the Upper Los Angeles River is the Arroyo Seco River, which makes up about 46.7 square miles of the total ULAR drainage area. The city of Pasadena and South Pasadena make up about 20% of the area tributary to the Arroyo Seco. The development of the San Rafael Treatment Basin Stormwater Capture Study in the City of Pasadena represents another major opportunity to continue the regional scale progress to achieve pollutant load reductions for the Upper Los Angeles River Watershed Management Program. Towards this goal, this report presents the analytical results evaluating the potential stormwater capture alternatives for a particular basin design. The practical infiltration basin design is specified as part of the creation of 60% design level documents for the project.

This project is intended to intercept a sizeable portion of the stormwater flows from the adjacent storm drain to the San Rafael Creek to the proposed project site. Stormwater will be diverted immediately downstream from the outfall of the 72" reinforced concrete pipe (RCP; Project No. BI 0562, Line F) managed by the Los Angeles County Flood Control District (LACFCD) at San Rafael Creek. A surface treatment infiltration and filtration basin best management practice (BMP) is proposed at the San Rafael site to capture and infiltrate stormwater from the diverted drainage channel (***Figure 1***). Project performance will be detailed in this report to demonstrate how the proposed design can contribute to both water quality goals as well as other important project considerations and desired outcomes. These options can then be considered and weighed before proceeding with the ultimate design of the project by identifying the project configuration that best meets the desired outcome and contributes to water quality benefits in a cost-effective manner.

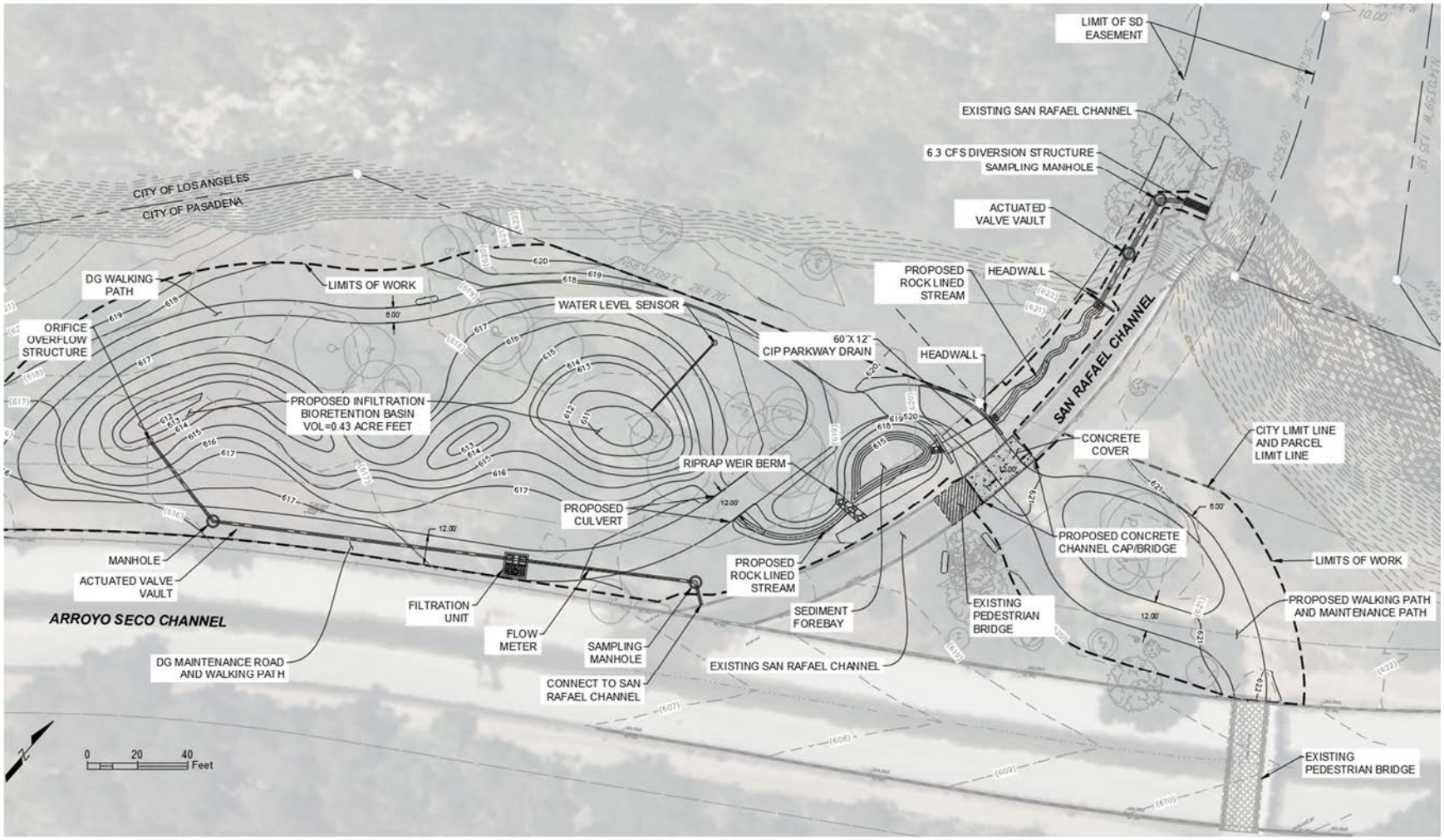


Figure 1. 60% Design Site Layout for San Rafael Treatment Basin

2.0 OBJECTIVES

To identify the most effective stormwater capture configuration at the project site, decision support modeling has been conducted to identify the optimal BMP configuration using a balanced approach that incorporates design storm hydrologic targets as well as long-term water quality considerations. BMP configuration recommendations will be made for the San Rafael site for the following key design criteria:

Diversion Rates

A range of feasible diversion flowrates were simulated to develop cost-effectiveness curves and to determine the optimal flowrate to be diverted to the capture facility that will provide the greatest water quality benefit without surpassing the point of declining returns. Flowrates will range in values grounded in construction feasibility and subject to other project constraints identified in the initial project concept development.

BMP Storage

Multiple Project conditions and constraints informed the final BMP size and footprint to be used at the site. The primary factors influencing BMP size included preserving native plant species, ensuring maintenance road access, and avoiding a nearby hillside and property boundary lines. Final BMP dimensions were determined prior to the creation of this report as part of the 60% design level documents. **The final BMP size has a total volume of approximately 0.437 ac-ft and total footprint of 0.248 acres.** The following analysis will demonstrate how this configuration can provide multiple benefits and treat the project tributary area.

Discharge –Water Use and Flowrate

Different routes exist for the outflows from the BMP, and each entails differing requirements, infrastructure, and constraints that impact the overall performance of the stormwater capture system and project cost. Also, these options represent different contributions to other local water supply efforts, of which stormwater is a growing component. Infiltration to local groundwater can be utilized to dewater the BMP. Infiltration feasibility has been determined by geotechnical analysis and will be discussed. While the design infiltration rate is set by geotechnical analysis, the infiltration outflow rate will vary because the wetted footprint available for infiltration varies with water depths. Additionally, the potential to filter stormwater and return it to the channel was assessed. Filtration throughflow rates for commonly available systems were evaluated to ensure that these discharge options are right sized to the baseline water quality for the drainage area and other system configuration options.

3.0 BASELINE SITE CONDITIONS AND CONSTRAINTS

The following subsections summarize the baseline watershed, hydrologic, and on-site conditions and constraints that were accounted for in the BMP configuration and optimization analysis for the San Rafael site.

3.1 Watershed Characterization

For this study, the Loading Simulation Program C++ (LSPC) software was used to simulate the contaminant loading, runoff volume, and flow rate associated with a long-term, 10-year continuous time series (Water Year 2009 to Water Year 2018) as well as the 85th percentile storm. The LSPC model used is part of the Los Angeles County Watershed Management Modeling System (WMMS 2.0), which is accepted by the Los Angeles Water Quality Control Board for performance of compliance analyses in the context of EWMP/WMP development.

The drainage area delineations for the project site (***Figure 2***) were developed using geospatial data associated with the WMMS modeling subwatersheds and verified/corrected slightly using further GIS analysis where full subwatersheds did not coincide with project locations and where subsurface storm drains overlapped. Digital stormwater pipe inventories and high-resolution Light Detection and Ranging (LiDAR) elevation data were used to accomplish subwatershed splitting. Developed drainage areas were used to model runoff and water quality baseline time series. These were then incorporated into BMP models to optimize the BMP decision variables. The overall area and impervious fraction are summarized in ***Table 1***.

Table 1. Summary of watershed and hydrologic conditions for the San Rafael Project drainage area

Total Tributary Area (ac)	Impervious Tributary Area (ac)	Average Annual Runoff (ac-ft)	Average Annual Zn Loading (lbs)	85th Percentile Surface Runoff (ac-ft)	85th Percentile Peak Flow (cfs)
442	54.9 (12%)	58.0	21.3	3.4	6.3

3.2 Hydrologic Considerations

Existing water quality and long-term baseline runoff stats were presented in ***Table 1***. During wet weather events, modeled hourly flow rates for the drainage area range from less than 200 cfs to nearly 1,200 cfs. The total loadings presented represent the maximum possible reductions that could be achieved by control measures at the project site. However, pragmatic diversion limitations, space constraints, and subsequent treatment mechanisms will ultimately limit how much runoff and pollutant mass can be potentially diverted into the BMP. Peak flow rate and total runoff for the 85th percentile, 24-hour design storm (0.78 in, taken from isohyetal data for the centroid of the drainage areas) are found in ***Table 1*** as well.

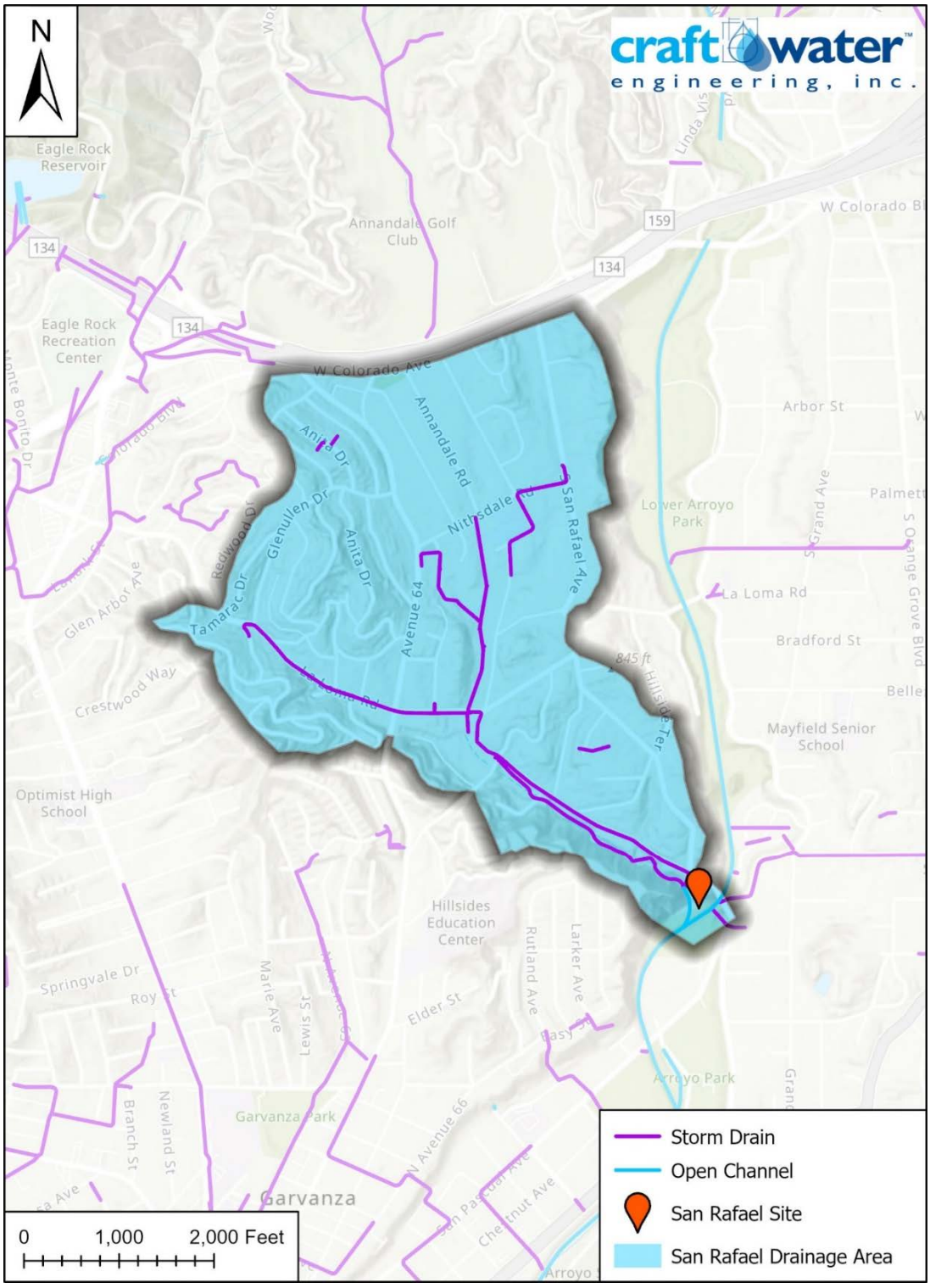


Figure 2. Drainage area to San Rafael Treatment Basin.

3.3 Hydraulic Analysis of Channel

As the project proposes to divert 6.3 cfs from the San Rafael Channel, the hydraulic impacts to the channel must be analyzed. To accomplish this, a Water Surface Pressure Gradient (WSPG) model was created to compute the existing and proposed water surface profile within the channel. The diversion structure is intended to be a drop inlet at the channel bottom. The channel design flow provided by LACFCD is 1560 cfs. The 1560 cfs flow model output for the existing channel conditions can be seen below in ***Figure 3***. The proposed channel diversion structure was modeled for a design storm flow (1560 cfs) and the resulting model output can be seen in ***Figure 4***. See ***Figure 5*** for the water surface elevation associated with both existing and proposed conditions. See ***Figure 6*** for the diagrams of the WSPG models for both existing and proposed conditions.

```
************************************
Water Surface Profile Gradient (WSPG)
XP WSPG
Engine Version 3.1         19/04/2012
Innovyze              www.innovyze.com
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INPUT FILE
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Computed  08/26/22  14:30:15

TITLE INFORMATION
************************************

WARNING SUMMARY
************************************

RESULTS
************************************


============================================================
   Main Line
============================================================

 Composite Profile:
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ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	BARREL	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION
###																	
"Outlet"	Outlet	0.00	611.49	618.90	615.206	3.716	1560.00	1	34.98	19.00	634.21	0.000	8.068	0.000	0.00000	0.000	Rect.open
	"i.p."	28.52	611.79	619.22	615.448	3.653	1560.00	1	35.58	19.66	635.11	0.000	8.068	3.281	0.01068	5.462	Rect.open
	"i.p."	102.93	612.59	620.04	616.073	3.483	1560.00	1	37.32	21.63	637.70	0.000	8.068	3.524	0.01068	5.462	Rect.open
	"i.p."	171.46	613.32	620.80	616.643	3.321	1560.00	1	39.14	23.79	640.43	0.000	8.068	3.785	0.01068	5.462	Rect.open
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"Trans.2"	Transition	236.00	614.00	621.50	615.889	1.889	1560.00	1	42.35	27.84	643.73	0.000	5.837	5.429	0.00000	0.000	Rect.open
	"i.p."	237.60	614.82	622.47	616.733	1.914	1560.00	1	41.79	27.12	643.85	0.000	5.837	5.323	0.51282	1.027	Rect.open
	"i.p."	242.91	617.54	625.72	619.551	2.008	1560.00	1	39.84	24.65	644.20	0.000	5.837	4.955	0.51282	1.027	Rect.open
	"i.p."	247.61	619.96	628.59	622.062	2.106	1560.00	1	37.99	22.41	644.47	0.000	5.837	4.613	0.51282	1.027	Rect.open
	"i.p."	251.79	622.10	631.14	624.306	2.209	1560.00	1	36.22	20.37	644.68	0.000	5.837	4.295	0.51282	1.027	Rect.open
"Spillway"	Reach	255.50	624.00	633.40	626.316	2.316	1560.00	1	34.54	18.52	644.84	0.000	5.837	3.999	0.51282	1.027	Rect.open
"Trans.1"	Transition	256.50	624.00	633.40	628.818	4.818	1560.00	1	32.38	16.28	645.09	0.000	9.111	2.599	0.00000	0.000	Rect.open
"BI 0562 "	Reach	339.50	626.02	634.00	630.840	4.820	1560.00	1	32.37	16.27	647.11	0.000	9.111	2.598	0.02434	4.811	Rect.open
"Headwork"	Headwrk	339.50	626.02	634.00	630.840	4.820	1560.00	1	32.37	16.27	647.11	0.000	9.111	0.000	0.00000	0.000	Rect.open

Figure 3: Existing Design Wardlow Channel Flow (1560 cfs)

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Water Surface Profile Gradient (WSPG)
XP WSPG
Engine Version 3.1        19/04/2012
Innovyze            www.innovyze.com
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INPUT FILE
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TITLE INFORMATION
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WARNING SUMMARY
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 WARNING 06: Upstream channel and downstream channel are the same for transition Div.3. Use a reach instead?
 WARNING 25: Link type element Div.3 has different invert elevation than its upstream node.

RESULTS
************************************


************************************************************
   Main Line
************************************************************

 Composite Profile:
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ELEMENT NAME	TYPE	STATION	INVERT ELEV	GROUND ELEV	W.S. ELEV	DEPTH	Q	BARREL	VELOC.	VELOC. HEAD	ENERGY GRADE LN	SUPER ELEV	CRITICAL DEPTH	FROUDE NUMBER	SLOPE	NORMAL DEPTH	CROSS SECTION
###																	
"Outlet"	Outlet	0.00	611.49	618.90	615.260	3.770	1553.70	1	34.34	18.31	633.57	0.000	8.047	0.000	0.00000	0.000	Rect.open
	"i.p."	21.06	611.71	619.13	615.440	3.725	1553.70	1	34.76	18.76	634.20	0.000	8.047	3.174	0.01068	5.446	Rect.open
	"i.p."	98.41	612.54	619.99	616.092	3.551	1553.70	1	36.46	20.64	636.73	0.000	8.047	3.409	0.01068	5.446	Rect.open
	"i.p."	169.39	613.30	620.77	616.685	3.386	1553.70	1	38.24	22.70	639.39	0.000	8.047	3.662	0.01068	5.446	Rect.open
"BI 0562 "	Reach	235.00	614.00	621.50	617.228	3.228	1553.70	1	40.10	24.97	642.20	0.000	8.047	3.933	0.01068	5.446	Rect.open
"Trans.2"	Transition	236.00	614.00	621.50	615.922	1.922	1553.70	1	41.45	26.68	642.60	0.000	5.822	5.269	0.00000	0.000	Rect.open
	"i.p."	239.13	615.61	623.41	617.584	1.977	1553.70	1	40.31	25.23	642.81	0.000	5.822	5.052	0.51282	1.024	Rect.open
	"i.p."	243.98	618.09	626.37	620.167	2.073	1553.70	1	38.43	22.93	643.10	0.000	5.822	4.704	0.51282	1.024	Rect.open
	"i.p."	248.28	620.30	629.00	622.473	2.174	1553.70	1	36.64	20.85	643.32	0.000	5.822	4.379	0.51282	1.024	Rect.open
	"i.p."	252.10	622.26	631.33	624.538	2.281	1553.70	1	34.94	18.95	643.49	0.000	5.822	4.077	0.51282	1.024	Rect.open
"Spillway"	Reach	255.50	624.00	633.40	626.392	2.392	1553.70	1	33.31	17.23	643.62	0.000	5.822	3.796	0.51282	1.024	Rect.open
"Trans.1"	Transition	256.50	624.00	633.40	629.021	5.021	1553.70	1	30.94	14.87	643.89	0.000	9.087	0.000	0.00000	0.000	Rect.open
"BI 0562 "	Reach	265.50	624.29	633.40	629.337	5.042	1553.70	1	30.81	14.74	644.08	0.000	9.087	0.000	0.03278	4.296	Rect.open
"Div_Top_"	WallEnt	265.50	624.29	633.40	629.337	5.042	1553.70	1	30.81	14.74	644.08	0.000	9.087	0.000	0.00000	0.000	Rect.open
"Div.3"	Transition	266.50	621.29	633.40	625.699	4.404	1553.70	1	35.28	19.32	645.02	0.000	9.087	2.962	-3.00000	0.000	Rect.open
"Div_Poin"	Junction	266.50	621.29	633.40	625.720	4.425	1560.00	1	35.26	19.30	645.02	0.000	9.111	0.000	0.00000	0.000	Rect.open
"Div.2"	Reach	267.50	621.29	633.40	625.716	4.421	1560.00	1	35.29	19.34	645.05	0.000	9.111	2.958	0.00000	7.000	Rect.open
"Div.1"	Transition	268.50	624.29	633.40	629.114	4.819	1560.00	1	32.37	16.27	645.39	0.000	9.111	2.599	3.00000	0.000	Rect.open
"BI 0562 "	Reach	339.50	626.02	634.00	630.840	4.820	1560.00	1	32.37	16.27	647.11	0.000	9.111	2.598	0.02430	4.814	Rect.open
"Headwork"	Headwrk	339.50	626.02	634.00	630.840	4.820	1560.00	1	32.37	16.27	647.11	0.000	9.111	0.000	0.00000	0.000	Rect.open

Figure 4: Proposed Diversion With Design (1560 cfs) Flow Analysis

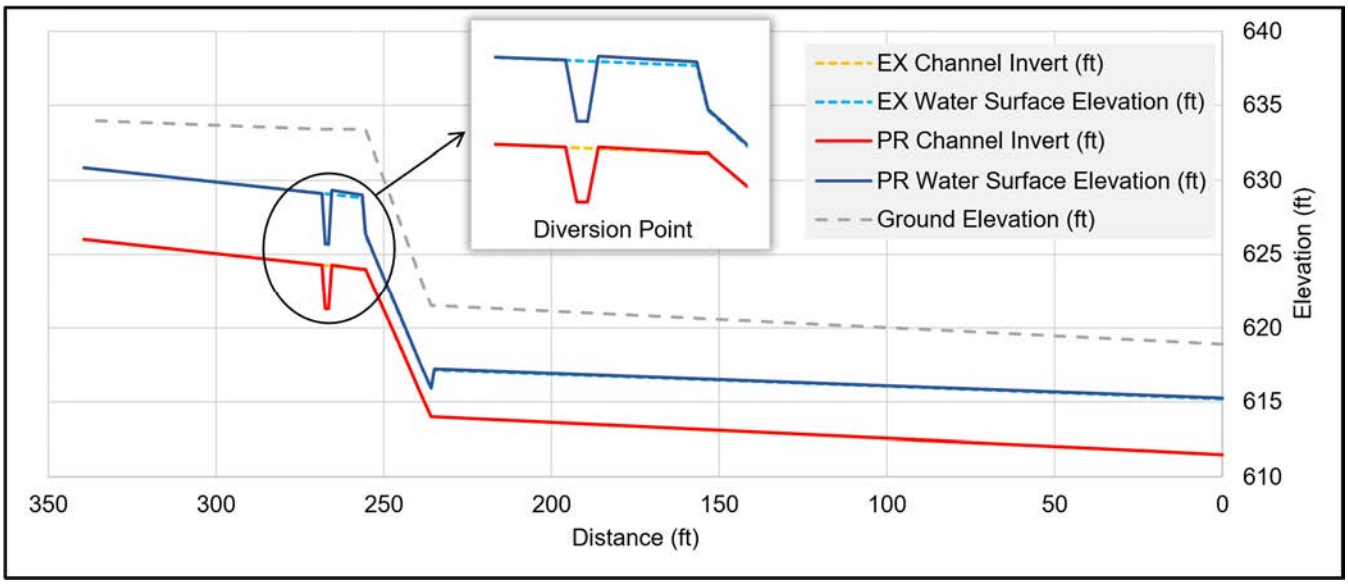


Figure 5: Water Surface Elevation of the Existing (EX) and Proposed (PR) Conditions

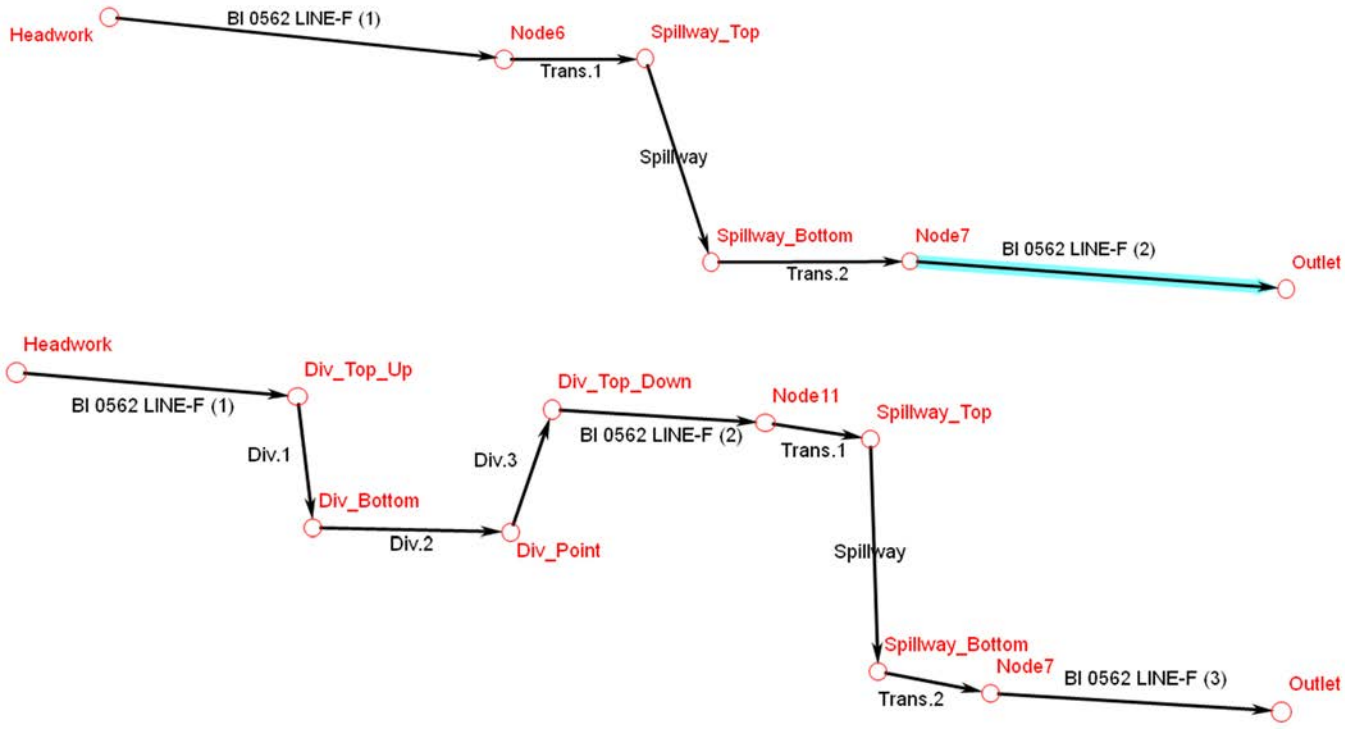


Figure 6: WSPG Models for Existing (Top) and Proposed (Bottom) Conditions

4.0 STORMWATER CAPTURE OPTIMIZATION METHODS

4.1 Water Quality Optimization Strategy

The primary design goal of the San Rafael Treatment Project is to reduce long-term annual loading of pollutants to the ULAR watershed using zinc as the limiting pollutant of interest in the analysis as established by the EWMP for this watershed group. To guarantee the capture of 85th percentile storm peak flow and runoff volume while maximizing the long-term pollutant reduction, optimization modeling was performed.

As mentioned previously, the BMP storage volume and footprint were created as part of the Project's 60% level design documents. Therefore, the purpose of optimization modeling in this memo is to find the combination of diversion rate and discharge options that maximized BMP performance (see ***Figure 7*** at right).

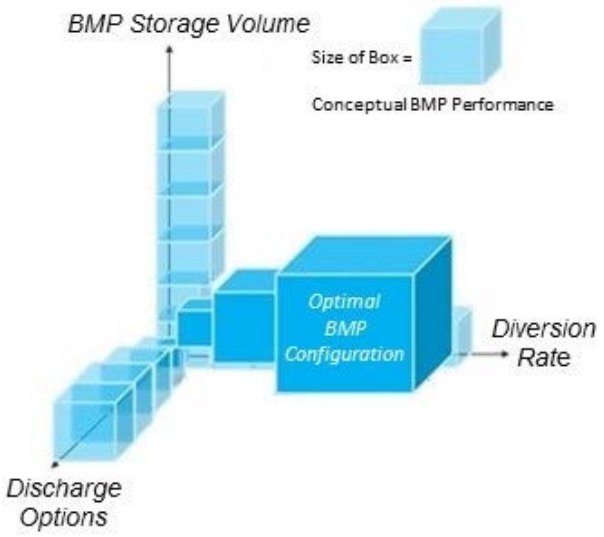


Figure 7. Conceptual illustration of optimization modeling balancing various design components to maximize performance.

The model setup for water quality simulation and optimization is complex, involving several modeling systems and iterative feedback from design engineers. The general methodology is discussed below, and the results are presented thereafter.

4.2 BMP Performance Modeling and Optimization

BMP performance was modeled under two different time frames: 1) during an 85th percentile, 24-hour storm, and 2) during a 10-year period.

The 85th percentile, 24-hour rainfall was read from the LA County Hydrology Map. A spreadsheet model was then used to simulate the diversion flow, storage, and discharge flows of the BMP at an hourly time step. The BMP configurations are designed to fully capture the 85th percentile peak flow and store the 85th percentile 24-hour runoff volume.

To better represent the BMP's long-term performance, a custom BMP model was used to improve upon certain modeling limitations in EPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN). This custom model is grounded in the physical BMP representations used in SUSTAIN, and it provides built-in optimization algorithms to more systematically automate the process of evaluating many different BMP configurations to select a cost-effective solution related to project goals. The model was run using 10 years of runoff and pollutant loading time-series data generated by LSPC at an hourly time step.

Modeling efforts investigated the range of BMP configurations as detailed in the following subsections.

4.2.1 Inflow Structure and Diversion Rates

It was determined based on the surveyed site topography that stormwater diversion through gravity is feasible for the San Rafael BMP. Compared to a pumped diversion, gravity is less costly to construct and easier to operate and maintain. Therefore, only a gravity diversion was modeled.

The diversion rate should be no lower than the 85th percentile storm peak flow to guarantee full 85th percentile storm capture. Smaller and larger diversion rates were also modeled to study the impact of diversion rate on the long-term performance.

4.2.2 Basin Configuration, Storage Volume, and Footprint

Site assessments and discussions with project stakeholders have led to the development of a surface basin BMP. ***Figure 8*** displays the process flow diagram for the BMP. The basin has a maximum storage volume of **0.437 ac-ft** and a water surface area of **10,810 sf** at maximum storage. These storage/footprint configurations were the only ones modeled for this analysis, as it was determined to be the most feasible to construct within the site footprint.

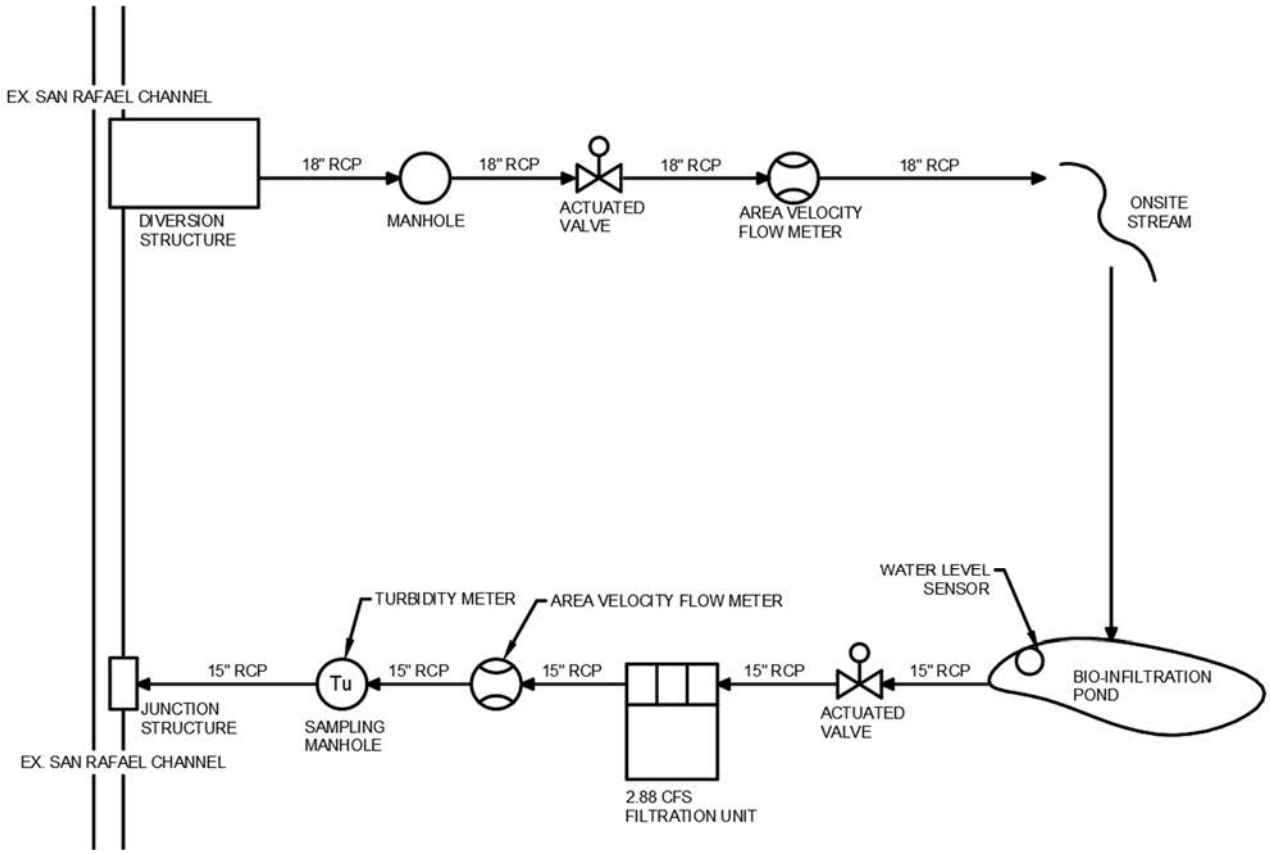


Figure 8. San Rafael BMP Process Flow Diagram

4.2.3 Discharge Alternatives

Different routes exist for the outflows from the BMP, with each entailing differing requirements, infrastructure, and constraints that impact the overall performance of the stormwater capture system and project cost. Additionally, these options represent different contributions to water supply and pollutant removal.

Infiltration Only

Geotechnical investigations indicated substantial infiltration rates at the proposed basin bottom depth (approximately 2.9 in/hr with factors of safety applied). While the infiltration rate is set at 2.9 in/hr, the entire basin footprint will not always be used for infiltration. Because of the shape of the basin, as more water is stored in the basin, a bigger area becomes available for infiltration, which results in a higher infiltration flow rate. The relationship between the volume of stored water and the infiltration area is illustrated in ***Figure 9***. Such effect is represented in the modeling.

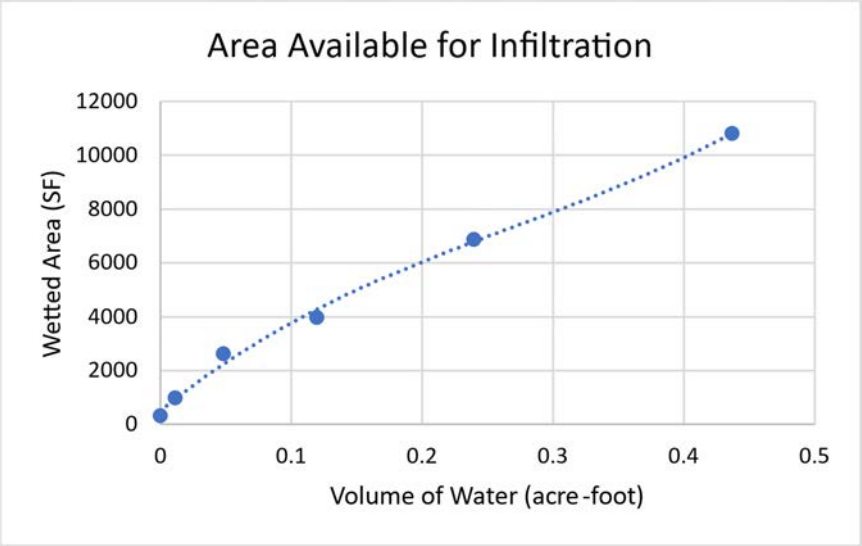


Figure 9. The Volume-Area Relationship for the San Rafael Basin

Infiltration and Filtration

Dual infiltration and filtration treatment was also analyzed for the San Rafael BMP. In the combined treatment configuration, diverted flows would first enter the basin to be treated through infiltration only. When the water level is above the filter outlet, the water will be filtered at the filtration rate. If the diverted flow is larger than the filtered flow, the excess flow would still contribute to filling the basin until the basin is full.

Several commonly available stormwater filtration devices were modeled (at 2.88 cfs, 5.76 cfs, and 7.84 cfs filtration rates). These values were chosen to cover a range of potential outflows common to off-the-shelf proprietary filter products. Because the available volume and footprint are limited, a higher filtration flow rate allows the BMP to treat and discharge more water, therefore accepting more water during bigger storms.

The storage volume reserved for infiltration ("infiltration pool") is also optimized to ensure the full capture of the 85th percentile design storm. If the total basin volume is unchanged and the infiltration pool is smaller, a bigger volume will be available during bigger storms to capture the peak runoff volume. However, to achieve the water supply benefits as part of the project objectives, the infiltration pool should not be too small. During utility design, the infiltration pool is controlled by setting the elevation of the outlet structure to the filter, as illustrated in ***Figure 10***.

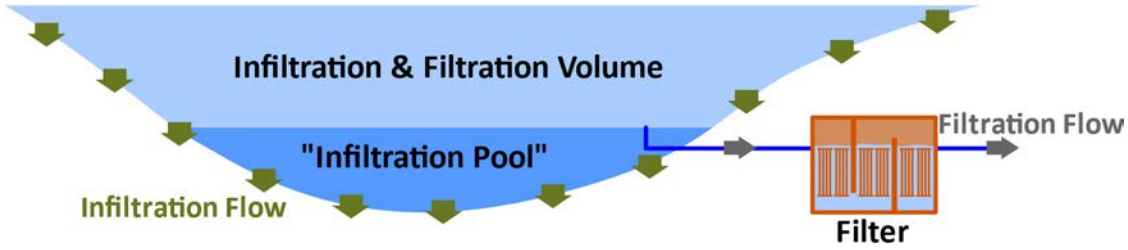


Figure 10. Storage Volume Reserved for Infiltration – "Infiltration Pool"

4.2.4 Safe Clean Water Program (SCWP) Transfer Agreement and O&M Considerations

When comparing treatment options, two performance metrics must be considered.

- **Pollutant Removal** — Filtration devices remove most of the pollutants that enter it; physical limitations prevent complete removal. While the effluent concentration is orders of magnitude smaller than pollutant loads, it still generally results in a small amount of pollutant leaving the BMP. Infiltrative BMPs, on the other hand, fully remove all diverted pollutants that enter it. The pollutant removal of a combined BMP depends on the amount of storage designated for infiltration and filtration.
- **Water Capture** — Filtration devices will usually return treated stormwater to an adjacent storm drain or channel, which may or may not have the potential for reuse. Infiltrative BMPs normally recharge groundwater. *However, previous analysis has determined that runoff infiltrated by the San Rafael BMP will not contribute to groundwater recharge*.

The combined performance of the San Rafael BMP and the San Pascual BMP (detailed in another report) must meet the performance metrics specified in the SCWP transfer agreement (see performance metrics in ***Figure 11***). The modeled performance of the recommended BMP configuration will be compared to the transfer agreement metrics in Section 7.2.

A-2. Consistent with SCW Program Goals

The City acknowledges that the Budget Plan is consistent with the Safe, Clean Water Program Goals as described in Chapter 18.04 of the Code. The following is a summary of the goals, projected targets, and metrics for reporting performance.

Table A-2. Program Goals and Anticipated Performance Metrics

No.	Goal	Summary	Target		Unit
1	Improve water quality and attainment of water-quality requirements	The stormwater capture and treatment facility will provide water quality improvements to address water quality requirements described in the Upper Los Angeles River Enhanced Watershed Management Program	Runoff Treated (average annual)	27.0	Acre-Feet
			Zinc Reduction (% Reduction)	65%	
2	Increase drought preparedness by capturing more stormwater and/or urban runoff to store, clean, reuse, and/or recharge groundwater basins	The facility will capture and treat urban runoff and stormwater runoff from the San Rafael Creek and Arroyo Seco Channel.	Average annual water captured and used for irrigation (average annual)	100	Acre-Feet
5	Invest in infrastructure that provides multiple benefits	This project is a multi-benefit project that improves water quality, provides water supply, and integrates native habitat	N.A.		
6	Prioritize Nature-Based Solutions	Landscape plans to include additional native trees, shrubs, and grasses to be installed at select spots impacted by the construction throughout the project area. The swales will be sized to convey all flows from the surface drainage.	Landscape Plans	1.0	Each
7	Provide a spectrum of project sizes from neighborhood to regional scales	The project will construct a regional stormwater capture facility	Design Plans	1.0	Each

Figure 11. Screenshot of the Transfer Agreement

Table 2 details key cost aspects that are both consistent among and differentiate between the various modeled options presented in this memo.

Table 2. Summary of key cost components for different discharge options.

Cost applicable to….	Key Cost Components	O&M Cost Components
All Options	Diversion Infrastructure, Pretreatment, Optional Pump	Inspection, Sediment Removal, Pumping Maintenance/Electricity
Infiltration	Excavation, Basin Construction	Landscaping Maintenance
Combination	Excavation, Basin Construction, Filtration Unit(s)	Landscaping Maintenance, Filter Cartridge Cleaning

5.0 OPTIMIZATION MODELING RESULTS

Using the methods described in Section 4.0, different configuration alternatives and modeling parameters are presented below to demonstrate the BMP performance associated with these options and narrow them down to a recommended project configuration that will meet different needs for the ULAR watershed.

5.1 Diversion Rate

The 85th percentile storm peak flow rate is 6.26 cfs. To fully capture the 85th percentile storm, the design diversion rate should be no smaller than 6.3 cfs. Other diversion rates were modeled to study the impact of diversion rate on the BMP's long-term stormwater capture and pollutant removal performance.

Table 3 compares the performance of an infiltration-only BMP with different diversion rates. Diversion rates above 6.3 cfs do not provide additional water supply or pollutant reduction benefits. When the diversion rate is high enough, the maximum storage volume and the treatment rate become the limiting factors of BMP performance, i.e. the BMP is not capable of treating all the flows diverted.

Table 3. Performance of the San Rafael Infiltration BMP with Various Diversion Rates.

Diversion Rate	Avg. Annual Runoff Infiltrated (ac-ft)	Avg. Annual Zinc Reduction (lbs)
1.0	21.1	5.60
5.0	25.0	8.87
6.3	25.0	8.88
10.0	25.0	8.88
15.0	25.0	8.88

Table 4 compares the impacts of diversion rates on a BMP with both infiltration discharge and filtration discharge. The infiltration pool is set to the optimal value (0.068 acre-feet) which will be discussed in the following sections. Similar to the comparison in ***Table 3***, making the diversion higher than 6.3 cfs does not significantly improve BMP performances, because the BMP performance is limited by the storage capacity and the treatment rate rather than the diversion rate. Therefore, to save construction cost, the recommended diversion rate is **6.3 cfs**.

Table 4. Performance of the San Rafael Combination BMP with Various Diversion Rates.

Diversion Rate	Avg. Annual Runoff Filtered (ac-ft)	Avg. Annual Runoff Infiltrated (ac-ft)	Avg. Annual Zinc Reduction (lbs)
1.0	7.2	14.2	5.0
5.0	22.6	15.3	11.8
6.3	23.1	15.7	12.5
10.0	23.3	15.9	12.8
15.0	23.3	15.9	12.8

5.2 Outflow Options

5.2.1 Infiltration Discharge or Combination Discharge

The modeled 85th percentile, 24-hour storm runoff volume is 3.409 acre-feet. Due to the limited basin volume and footprint, the infiltration-only option only treats 1.610 acre-feet, which is significantly smaller than the full 85th percentile runoff. Therefore, a filter must be used to increase runoff capture. The combination outflow option that discharges water through infiltration and filtration will be used.

5.2.2 Recommended Filtration Rate and Infiltration Pool Volume

Three filtration rates (2.88 cfs, 5.76 cfs, and 7.84 cfs) were considered. To save construction and maintenance costs, a smaller filtration unit with a lower filtration rate is preferred. However, to fulfill the 85th percentile volume capture requirement, a smaller filter needs to start filtering at a lower water level so that it can filter enough water in the basin. This means the outlet to a smaller filter needs to be lower, and the infiltration pool would be smaller, as illustrated in ***Figure 10***.

The maximum infiltration pool is determined based on 85th percentile runoff volume capture using each filter. Any infiltration pool smaller than this value will leave space in the basin to accept the peak flow. The results are compiled in ***Table 5***.

Table 5. Average Performance of BMP Treatment Types across all Filtration Rates.

Outflow	Max. Infil. Pool to Capture 85th Storm Runoff (acre-feet)	Avg. Annual Runoff Filtered (ac-ft)	Avg. Annual Runoff Infiltrated (ac-ft)	Avg. Annual Total Runoff Treated (ac-ft)	Avg. Annual Zinc Removal (lbs)
2.9 in/hr infiltration, **2.88 cfs filtration**	0.068	23.1	15.7	38.8	12.5
2.9 in/hr infiltration, **5.76 cfs filtration**	0.437 (full basin)	17.3	25.0	42.3	13.9
2.9 in/hr infiltration, **7.84 cfs filtration**	0.437 (full basin)	17.3	25.0	42.3	13.9

Using the smallest filter, the maximum allowable infiltration pool volume is 0.068 acre-feet. Any storage volume above this value will be available for the filter. This option requires the outlet to the filter to be set at approximately 2.6 feet below the maximum water level. The performance of the 5.76 cfs and the 7.84 cfs filter are similar. Compared to the 2.88 cfs filter, the larger filters provide significantly more groundwater recharge through infiltration (avg. annual runoff infiltrated), and slightly better pollutant removal (avg. annual zinc removal).

As mentioned in Section 4.2.4, infiltration at the San Rafael site is no longer considered a groundwater recharge benefit. To save costs and maintenance effort without losing too much pollutant removal benefits, the **2.88 cfs** filtration unit and a **0.068 acre-feet** infiltration pool are recommended.

5.3 Recommendation Summary

According to the optimization modeling results in Section 5.1 and 5.2, the following configurations are recommended for the San Rafael BMP:

- **Diversion rate: 6.3 cfs gravity diversion.**
- **Mode of discharge: infiltration and filtration.**
- **Filtration rate: 2.88 cfs.**
- **Storage volume reserved for infiltration only (infiltration pool): 0.068 acre-feet; outlet to the filter to be set at approximately 2.6' below the maximum water level.**

This BMP configuration is expected to provide full capture of the 85th percentile storm peak flow and runoff volume. The modeled average annual runoff filtered is **23.1 acre-feet** (60% of total stormwater capture), and the average annual runoff infiltrated is **15.7 acre-feet** (40% of total stormwater capture). The BMP is expected to remove an average of **12.5 pounds** of Zinc per year.

6.0 DIVERSION STRUCTURE DESIGN

The proposed diversion structure consists of a drop inlet with grates spanning the width of the storm drain, and an 18-inch diversion pipe conveying water from the drop inlet to a stream. This section explains the configuration of the diversion structure, and its anticipated performance predicted by hydraulic calculations.

6.1 Diversion Structure Configuration

The proposed drop inlet will span across the bottom of the 10' X 5' rectangular open channel. The grated inlet is 3’-7” wide along the channel, and 8’-9” long across. The bottom of the drop inlet has a slope across the channel towards the diversion pipe. The proposed diversion pipe will be an 18” Reinforced Concrete Pipe at a 0.5% slope. ***Figure 12*** and ***Figure 13*** are the plan and section view of the proposed diversion structure and diversion pipe.

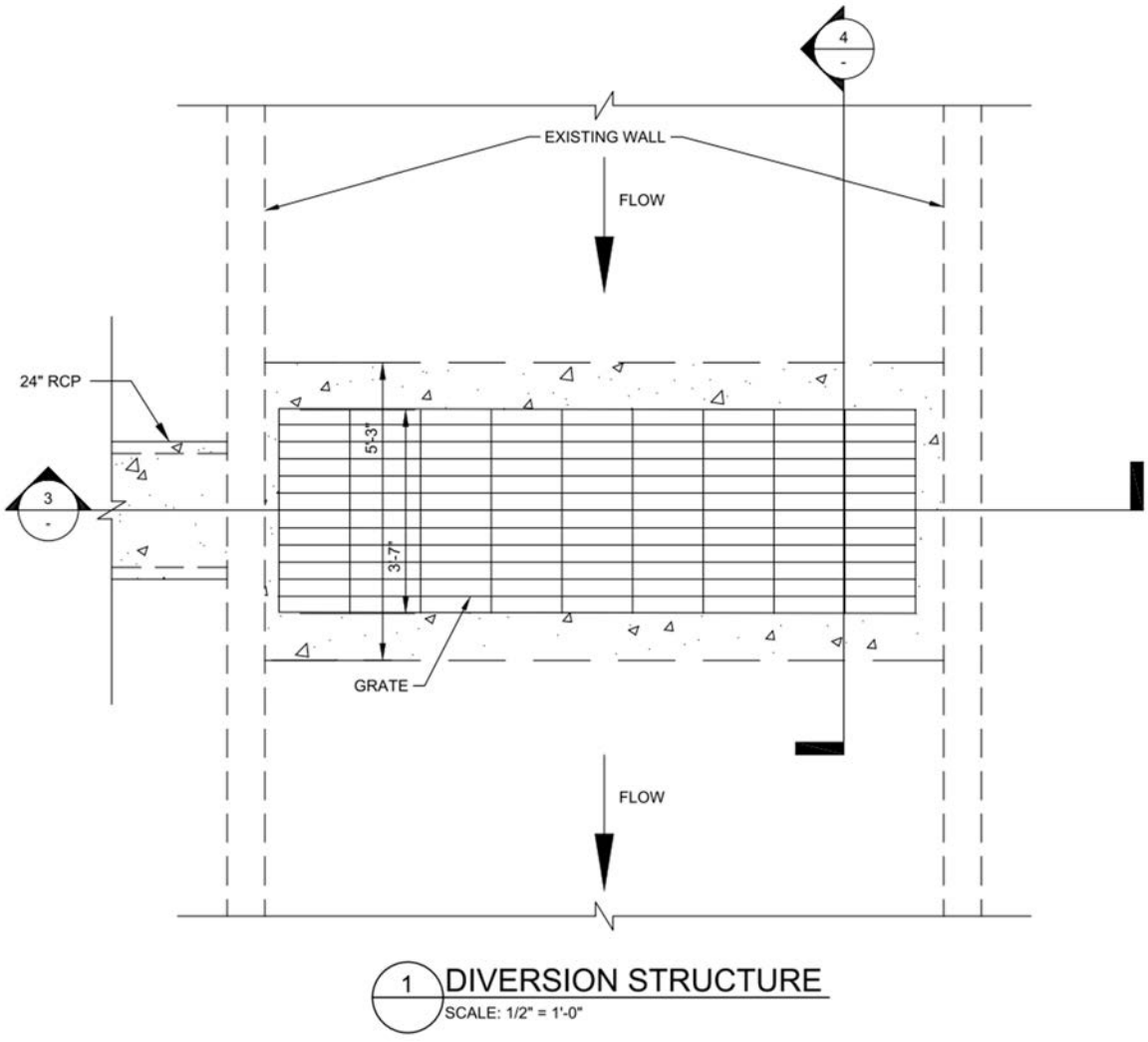


Figure 12. Proposed Channel Diversion Structure Plan View

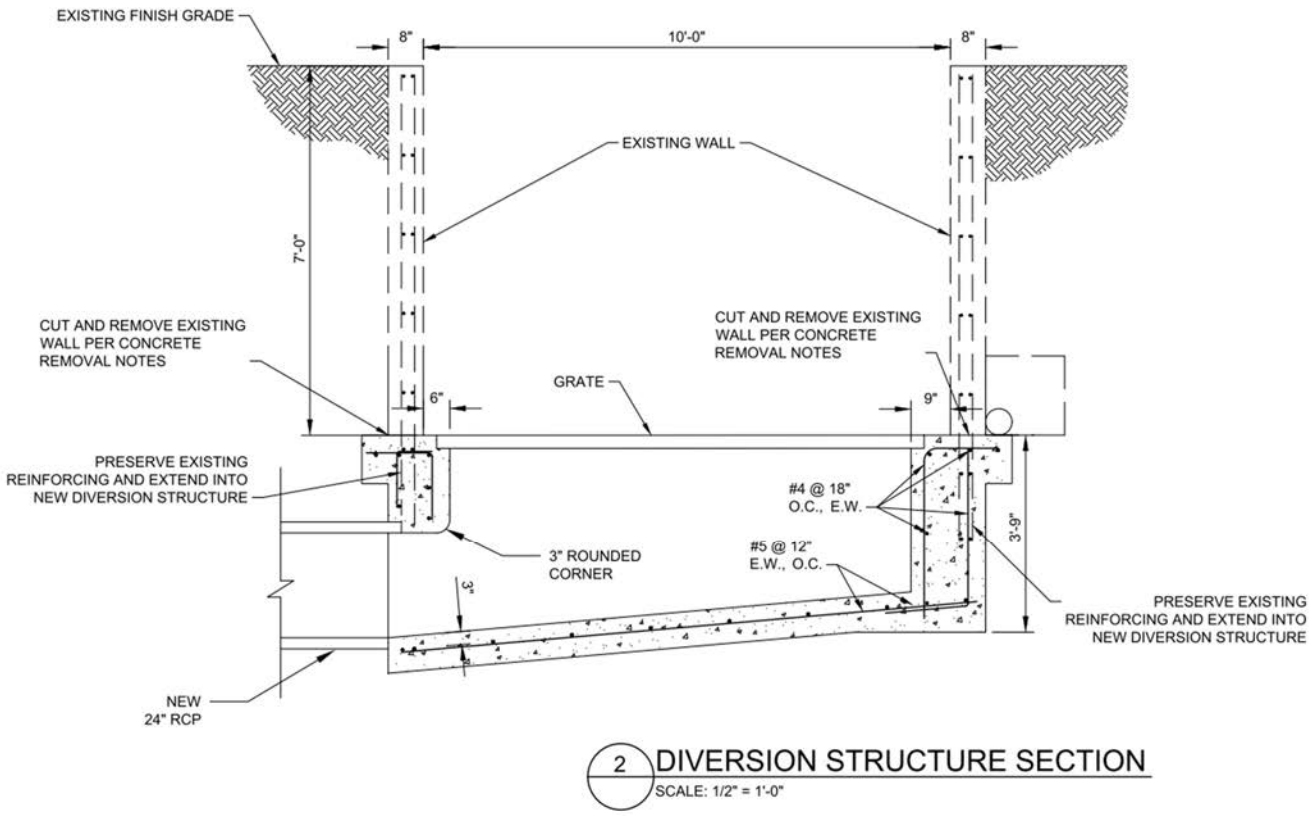


Figure 13. Proposed Channel Diversion Structure Section View

6.2 Diversion Structure Performance Prediction

The diversion structure configuration is simplified for hydraulics calculations. Equation and parameters from the Federal Highway Administration's *Urban Drainage Design Manual* (HEC-22) were used for the following calculations. The components of the system are:

- The existing storm drain simplified as a single rectangular open channel. The channel has a width of 10', a maximum depth of 5', a longitudinal slope of 0.0243, and a Manning's n of 0.013.
- A grate simplified as an orifice. The grate is 8'-9" long across the channel and 3'-7" wide along the channel. An opening area of 80% is assumed (P-50 x 100 grate). To ensure sufficient flow capacity under clogging conditions, a clogging factor of 0.5 is applied to further reduce the effective grate opening area.
- An 18" diameter circular pipe at 0.5% slope flowing as a culvert. Culvert calculation was performed in Hydraflow Express Extension for Autodesk Civil 3D.

Figure 14 illustrates the relationship between these components. As discussed in Section 5.3, the recommended diversion rate is 6.3 cfs. Calculations were performed to examine whether sufficient diversion capacity is provided.

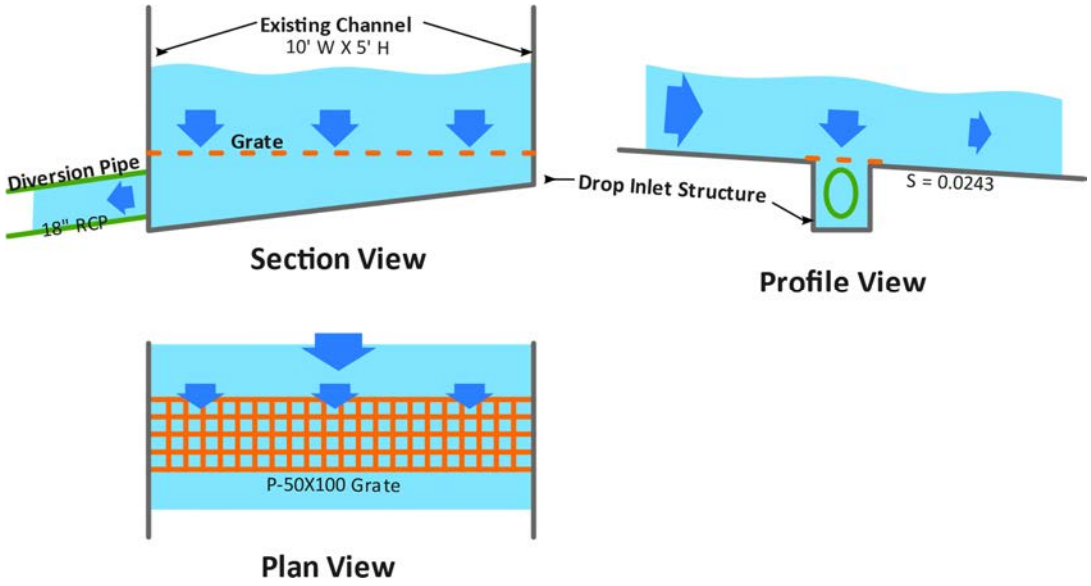


Figure 14. Components of Hydraulics Calculations

6.2.1 Existing San Rafael Open Channel

Flow rate in the channel at depth d is calculated with Manning's equation (HEC-22 Section 5.1.5, Equation 5-5),

$$Q = (1.486/n)\, A\, R^{2/3}\, S^{1/2}$$

$$A = Ld,\ P = 2d + L,\ R = A/P$$

where n = 0.013 is the Manning's roughness coefficient for concrete, L = 10 ft is the channel bottom width, d is the flow depth upstream of the diversion structure, P is the wetted perimeter in ft, A is the cross-sectional flow area in sqft, R is the hydraulic radius in ft, and S = 0.0243 is the energy grade line slope.

6.2.2 Drop Inlet Grate

The performance of the drop inlet grate was calculated based on the *San Diego County Hydraulic Design Manual - September 2014* which references the Federal Highway Administration's *Urban Drainage Design Manual* (HEC-22 Section 4.4.5.1). The grate capacity Q is calculated as follows,

$$Q = C_O(0.8LWC_A)(2gd)^{0.5}$$

where C_O = 0.67 is the orifice coefficient, 0.8×L×W is the grate opening area in sqft, C_A=0.5 is the area clogging factor, g = 32.2 ft/s^2 is the gravitational acceleration, and d is the channel flow depth upstream of the grate in ft.

6.2.3 Diversion Line

Several flow rate values were used in Hydraflow to calculate the hydraulic grade line (HGL). The headwater elevation is the water elevation in the drop inlet structure which is considered to be the same as the elevation in the open channel. ***Figure 15*** shows the inputs of the Hydraflow Express tool.

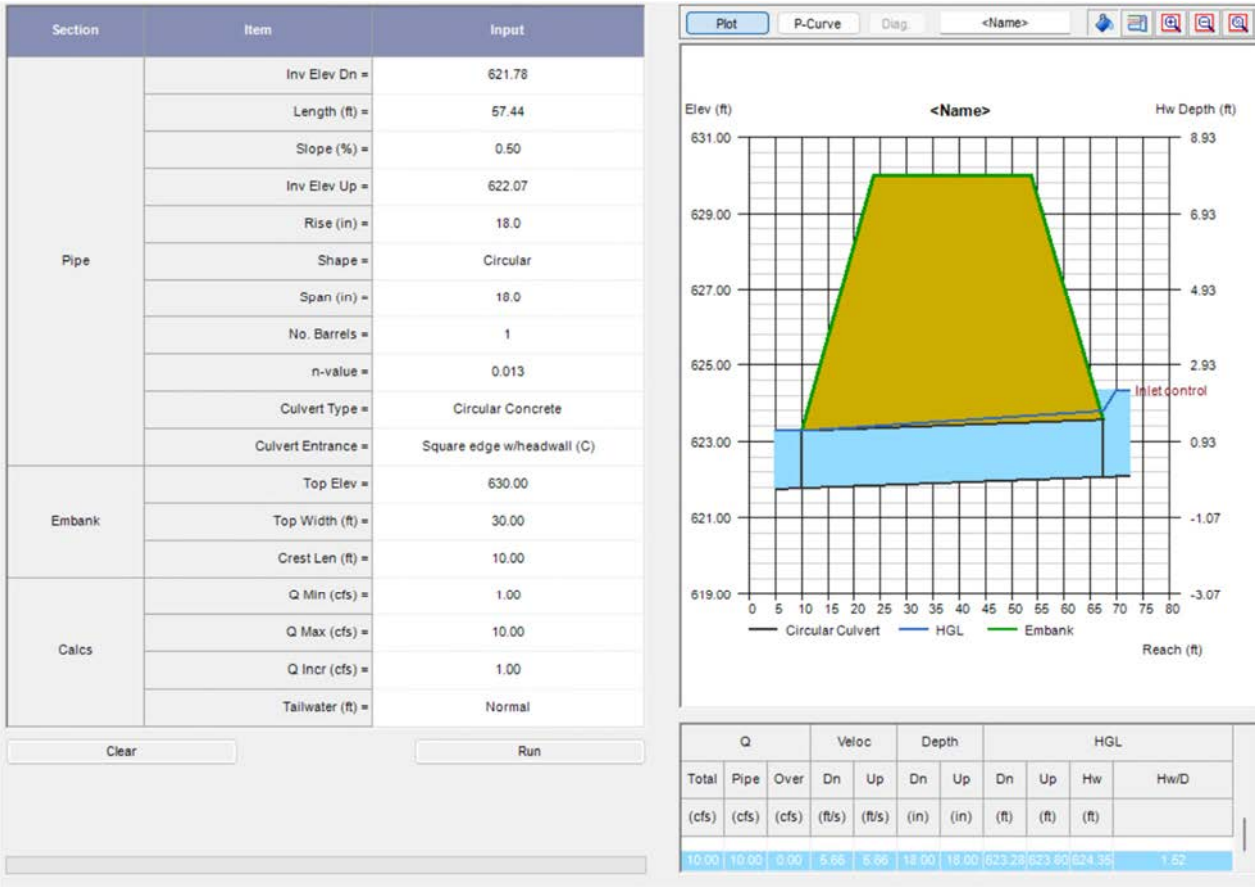


Figure 15. Hydraflow Express Inputs and Outputs for Culvert Calculation

6.2.4 Performance Prediction

The flow diverted to the San Rafael basin would be the smallest of 1) the flow rate in the storm drain, 2) the drop inlet grate capacity, and 3) the diversion pipe capacity. The grate capacity and the diversion pipe capacity are compared to the channel flow rate in ***Figure 16***.

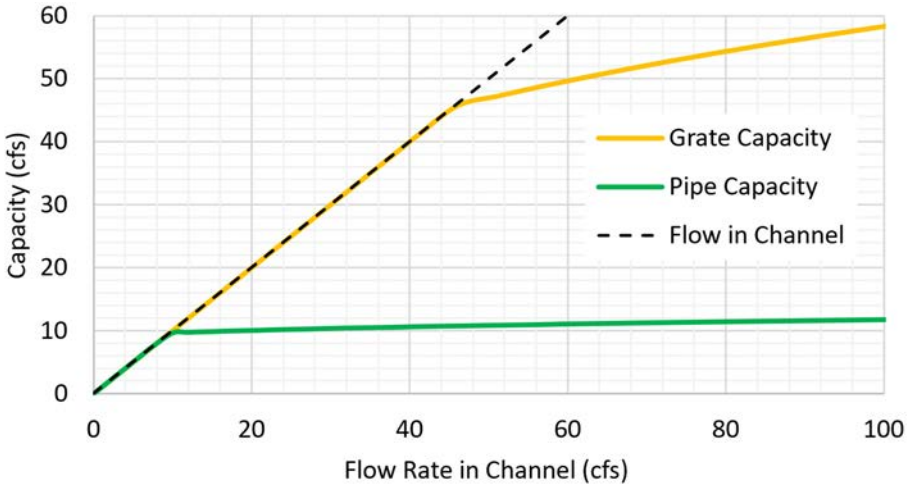


Figure 16. Diverted Flow Rate Prediction

It can be observed from ***Figure 16*** that pipe capacity is the limiting factor of the diversion rate. The grate has the sufficient capacity to provide flow to the diversion pipe even if 50% of the grate area was clogged (as assumed in Section 6.2.2). The diversion pipe can divert the 6.3 cfs 85th percentile peak flow when there is 6.3 cfs in the channel.

The flow diverted to the BMP will exceed 6.3 cfs during high flow conditions. Based on the 10-year hourly runoff time-series generated by LSPC, the highest flow rate in the channel within that 10-year period is 52 cfs, under which condition 11 cfs will be diverted to the BMP. The modeled 10-year runoff in the San Rafael channel was organized as an empirical cumulative distribution function (ECDF) graph shown in ***Figure 17***. According to the graph, the runoff in the channel and the diverted flow rate will stay under 6.3 cfs 99.7% of the time.

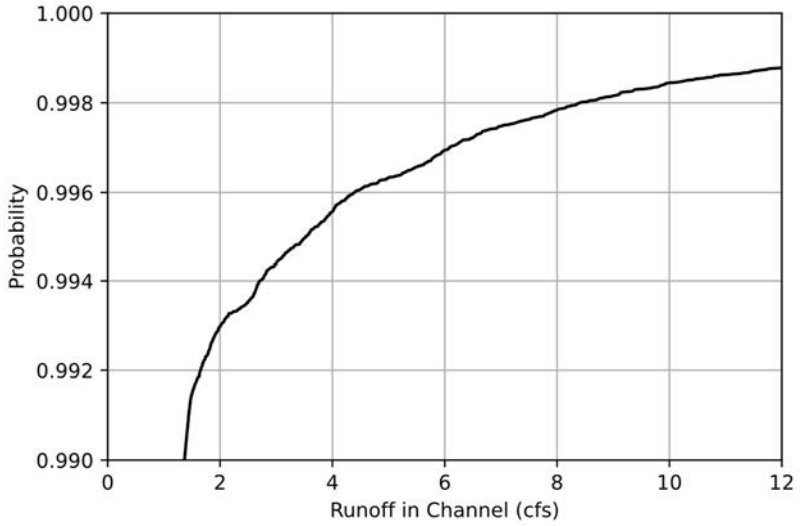


Figure 17. Empirical Cumulative Distribution Function of Modeled Runoff in San Rafael Channel

Based on the hydraulics calculation summarized in ***Figure 16*** and the long-term runoff modeling summarized in ***Figure 17***, it was concluded that

- The diversion structure can meet the targeted diversion rate of 6.3 cfs when there is 6.3 cfs in the channel. The diverted flow rate is controlled by the diversion pipe.
- The stream and the basin should be designed to handle a peak diverted flow rate of approximately 10 cfs which will occur during some extreme conditions.
- Considering the low probability of the diverted flow rate exceeding 11 cfs, the current flow control design is sufficient to handle the high flows.

7.0 SUMMARY AND CONCLUSION

7.1 Analysis and Modeling Results

The design and performance of the San Rafael treatment basin were modeled using the 85th percentile 24-hour design storm and the 10-year hourly runoff and pollutant time series. The recommended BMP configuration consists of a 6.3 cfs gravity diversion structure, a 0.437 acre-feet basin with 0.068 acre-feet reserved for infiltration only, and a 2.88 cfs filtration unit on the discharge line. The recommended BMP configuration is expected to provide 1) full capture of the 85th percentile storm peak flow and runoff volume, 2) 23.1 acre-feet stormwater filtration per year, 3) 15.7 acre-feet infiltration per year, and 4) 12.5 pounds of Zinc removal per year. Analysis shows that the diversion structure has sufficient capacity and can handle high flows in the channel.

7.2 Compliance with the Transfer Agreement

The Safe Clean Water Program (SCWP) transfer agreement specifies the performance target for the Arroyo Seco Treatment Wetlands Project which consists of the San Rafael site and the San Pascual site (see ***Figure 11***). According to the analysis for San Rafael in this report and a previous report for San Pascual, the combined benefits of the two sites meets the performance metrics in the transfer agreement. The modeled performances of the two sites are summarized in ***Table 6***.

Table 6. Comparison Between Modeled Project Performance and Targeted Performance

Metrics	San Rafael	San Pascual	Total	Target
Average Annual Runoff Volume Treated (ac-ft)	38.8	534	572.8	27.0
Average Annual Zinc Load Reduction Compared to Divertible Load	12.5 lbs (81%)	157 lbs (74%)	169.5 lbs (80%)	65%
Average Annual Water Capture for Water Supply (ac-ft)	Not Counted	320	320	100

7.3 Contribution to EWMP Compliance Goals

The ULAR EWMP (to which the Arroyo Seco is tributary to) bases their compliance pathway on structural BMP Capacity. While this is implicitly based on pollutant reduction, BMP storage capacity is the regulatory metric that cities are held to. The updated ULAR EWMP Appendix 7F (not approved by the water board as of Jan 2023) details the required structural BMP capacity for the City of Pasadena within the Arroyo Seco watershed to be 86.9 ac-ft, 8.2 ac-ft of which is designated for regional projects on public parcels. See clip from the EWMP below (***Figure 18***).

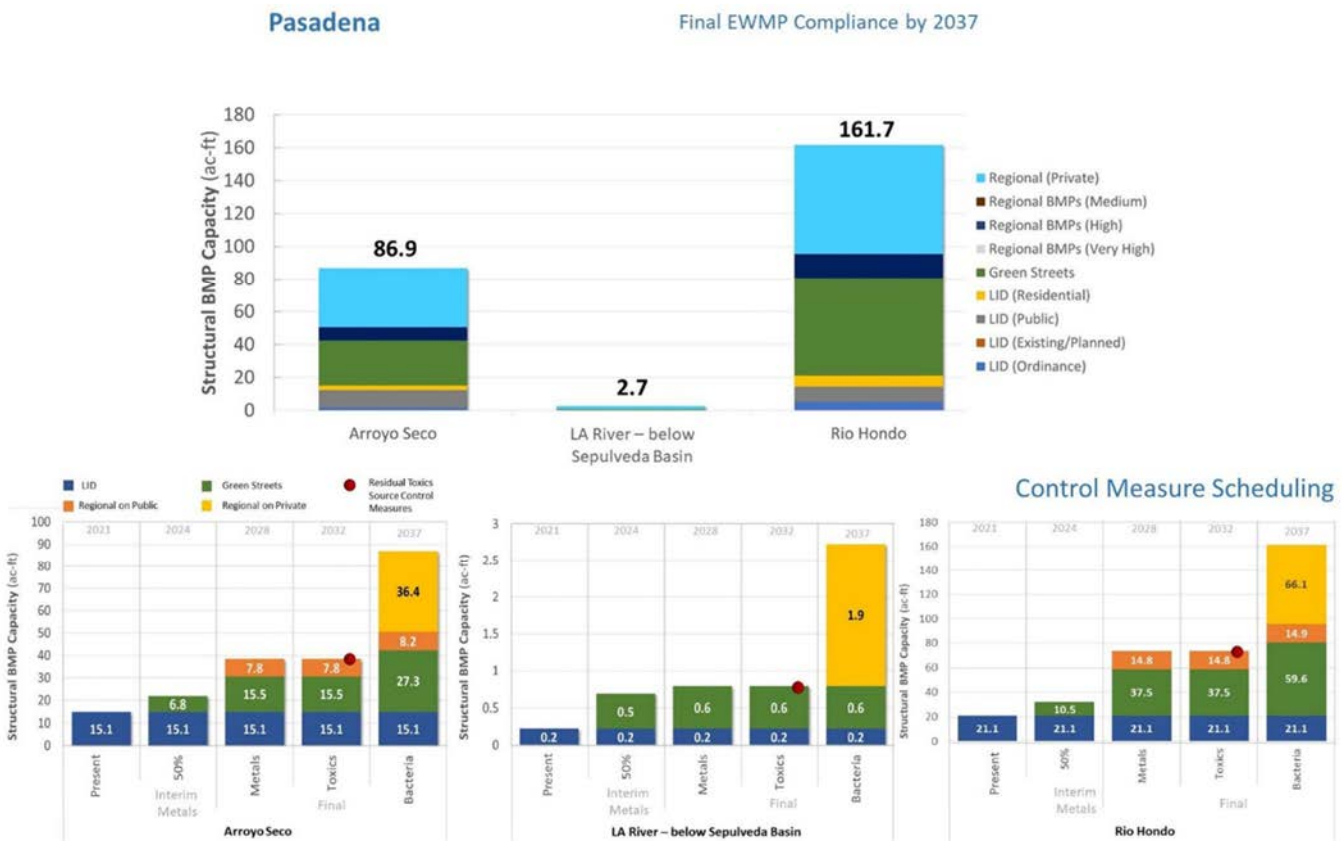


Figure 18. City of Pasadena EWMP Compliance Targets

San Rafael provides 0.437 ac-ft of storage. Therefore, it fulfills about 5.3% (0.437/8.2) of this regional on public fraction and approximately 0.5% (0.437/86.9) of the City of Pasadena's total. However, we consider "treated volume" to be a more appropriate volume metric as the EWMP did not take into consideration infiltration or filtration benefits. During an 85th percentile 24-hour design storm, San Rafael treats an additional 0.018 ac-ft of volume due to infiltration and 2.886 ac-ft of volume is treated by the outflow filter. Therefore, the total treated volume is 0.437 + 0.018 + 2.886 = 3.341 ac-ft, which would be 3.8% (3.341/86.9) of the City of Pasadena's total compliance goal. Although BMP storage is currently attached to the MS4 permit, we expect the Regional Board to lean towards pollutant load reduction amount more than BMP storage amounts as a regulatory metric in future WMPs.

Appendix E-2

Stormwater Capture Study Technical Memorandum

MEMO

TO: Christina Monde, Project Manager – City of Pasadena

CC: Brent Maue, Assistant City Engineer – City of Pasadena
Joe Conroy, Engineer – City of Pasadena

FROM: Courtney Semlow, Project Manager – Craftwater Engineering, Inc.
Thom Epps, Senior Stormwater Systems Scientist – Craftwater Engineering, Inc.

SUBJECT: San Pascual Stormwater Capture Facility
Stormwater Capture Study Technical Memorandum

DATE: September 27, 2022

The Upper Los Angeles River (ULAR) Watershed is a largely built-out, urbanized watershed of approximately 485 square miles, or 310,400 acres. Runoff from this watershed drains to over 50 linear miles of the LA River. One major tributary to the Upper Los Angeles River is the Arroyo Seco River, which makes up about 46.7 square miles of the total ULAR drainage area. The city of Pasadena and South Pasadena make up about 20% of the area tributary to the Arroyo Seco. The development of the San Pascual Stormwater Capture Facility Study in the City of Pasadena represents another major opportunity to continue the regional scale progress to achieve pollutant load reductions for the Upper Los Angeles River Watershed Management Program. Towards this goal, this memo presents the analytical results evaluating the potential stormwater capture and water use alternatives for a treatment basin design. The exact basin design was specified during the creation of 60% design level documents for the project. These design documents and this Stormwater Capture Study can then be utilized to support a funding application under Los Angeles County's Safe, Clean Water Program.

This project is intended to intercept a sizeable portion of the stormwater flows from the Arroyo Seco Channel to the project site (**Figure 1-1**). Stormwater will be diverted from the Arroyo Seco reinforced concrete channel (Concrete Conduit Section 2) managed by the Los Angeles County Flood



Figure 1-1. San Pascual Site, South Pasadena/Los Angeles



Figure 1-2. Existing Diversion within Arroyo Seco

Control District (LACFCD) at an existing diversion (**Figure 1-2**) point that already directs flows to the project location. A surface treatment infiltration and filtration basin best management practice (BMP) is proposed at the San Pascual site to capture and infiltrate stormwater from the diverted drainage channel. Potential project performance will be detailed in this memo to demonstrate how the proposed design can contribute to both water quality goals as well as other important project considerations and desired outcomes. These options can then be considered and weighed before proceeding with the ultimate design of the project by identifying the project configuration that best meets the desired outcome and contributes to water quality benefits in a cost-effective manner.

1.0 OBJECTIVES

To identify the most effective stormwater capture configuration at the project site, decision support modeling has been conducted to identify the optimal BMP configuration using a balanced approach that incorporates design storm hydrologic targets as well as long-term water quality considerations. BMP configuration recommendations will be made for the San Pascual site for the following key design criteria:

Diversion Rates

A range of feasible diversion flowrates will be simulated to develop cost-effectiveness curves and to determine the optimal flowrate to be diverted to the capture facility that will provide the greatest water quality benefit without surpassing the point of declining returns. Flowrates will range in values grounded in construction feasibility and subject to other project constraints identified in the initial project concept development.

BMP Storage

Multiple Project conditions and constraints informed the final BMP size and footprint to be used at the site. The primary factors influencing BMP size included preserving trees, ensuring maintenance road access, creating a public walkway, and maintaining existing elevations. Final BMP dimensions were determined prior to the creation of this memo as part of the 60% design level documents. **The final BMP size has a total volume of approximately 3.46 ac-ft and total footprint of 0.73 acres.** The following analysis will demonstrate how this configuration can provide multi-benefits and treat the project tributary area.

Discharge –Water Use and Flowrate

Different routes exist for the outflows from the BMP, and each entail differing requirements, infrastructure, and constraints that impact the overall performance of the stormwater capture system and project cost. Also, these options represent different contributions to other local water supply efforts, of which stormwater is a growing component. Infiltration to local groundwater can be utilized to dewater the BMP and contribute to regional groundwater recharge goals. Infiltration feasibility has been determined by geotechnical analysis and will be discussed within this memo. While the design infiltration rate is set by geotechnical analysis, the infiltration outflow rate will vary. This is because the entire basin footprint will not always be available for infiltration since the amount of infiltrative area is dependent on the wetted basin surface. This phenomenon is further discussed in Section 3.2.4. The potential to capture dry weather flows for off-site irrigation was also analyzed. Stormwater for irrigation would be used at the nearby golf course, and potentially directed to a nearby park. Water reuse benefits for this scenario are analyzed within this memo. Additionally, the potential to filter stormwater and return it to the channel will be assessed for this site to quantify the potential benefits of different options. Filtration throughflow rates for commonly available systems will be evaluated to ensure that these discharge options are right sized to the baseline water quality for the drainage area and other system configuration options. A combination of infiltration and filtration treatment will also be analyzed to determine if the BMP can create a meaningful balance between water supply and water quality.

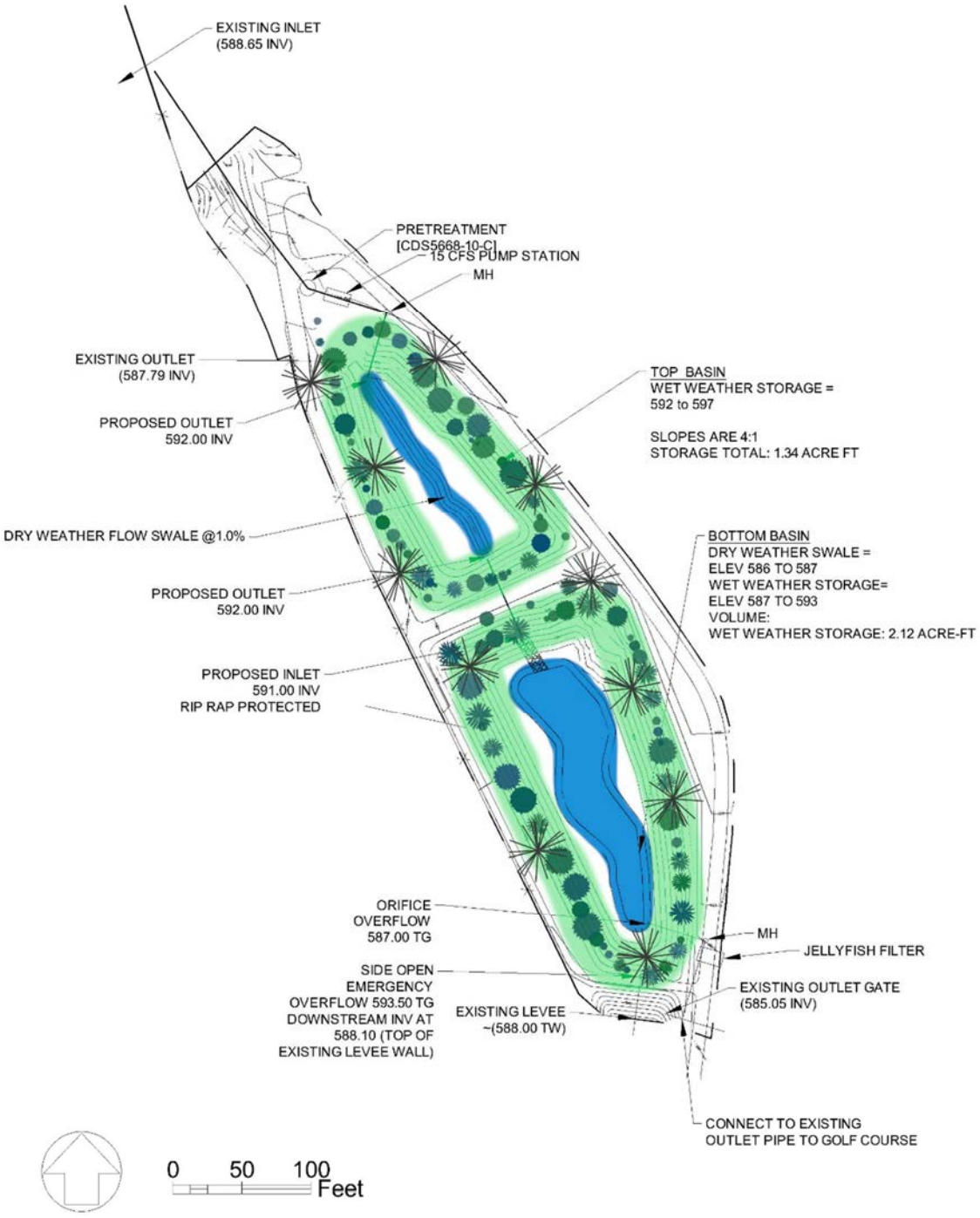


Figure 1-3. Preliminary concept schematic for the San Pascual Treatment Basin BMPs, east of the Arroyo Seco Channel (may not represent final project details).

2.0 BASELINE SITE CONDITIONS AND CONSTRAINTS

The following subsections summarize the baseline watershed, hydrologic, and on-site conditions and constraints that will be accounted for in BMP configuration and optimization analysis for the San Pascual site.

2.1 Watershed Characterization

For this study, the Loading Simulation Program C++ (LSPC) software was used to simulate the contaminant loading, runoff volume, and flow rate associated with a long-term, 10-year continuous time series (Water Year 2009 to Water Year 2018) as well as the 85th percentile storm. The LSPC model used is part of the Los Angeles County Watershed Management Modeling System (WMMS 2.0), which is accepted by the Los Angeles Water Quality Control Board for performance of compliance analyses in the context of EWMP/WMP development.

The drainage area delineations for the project site (**Figure 2-1**) were developed using geospatial data associated with the WMMS modeling subwatersheds and verified/corrected slightly using further GIS analysis where full subwatersheds did not coincide with project locations and where subsurface storm drains overlapped. Digital stormwater pipe inventories and high-resolution Light Detection and Ranging (LiDAR) elevation data were used to accomplish subwatershed splitting. Developed drainage areas were used to model runoff and water quality baseline timeseries'. These were then incorporated into BMP models to optimize the BMP decision variables. The overall area and impervious fraction are summarized in **Table 2-1**

Table 2-1. Summary of watershed and hydrologic conditions for the San Pascual Project drainage area

Total Tributary Area (ac)	Impervious Tributary Area (ac)	Average Annual Runoff (ac-ft)	Average Annual Zn Loading (lbs)	85th Percentile Surface Runoff (ac-ft)	85th Percentile Peak Flow (cfs)
5,018	863 (17.2%)	1,305	613	58.2	85.9

2.2 Hydrologic Considerations

Long-term baseline flows and pollutant loads to the site are also summarized in **Table 2-1**. The total loadings presented in this table represent the maximum possible reductions that could be achieved by control measures at the project site. However, pragmatic diversion limitations, space constraints, and subsequent treatment mechanisms will ultimately limit how much runoff and pollutant mass can potentially be diverted into the BMP. Peak flow rate and total runoff for the 85th percentile design storm (1.05 in., taken from isohyetal data for the centroid of the drainage areas) are found in **Table 2-1** as well.

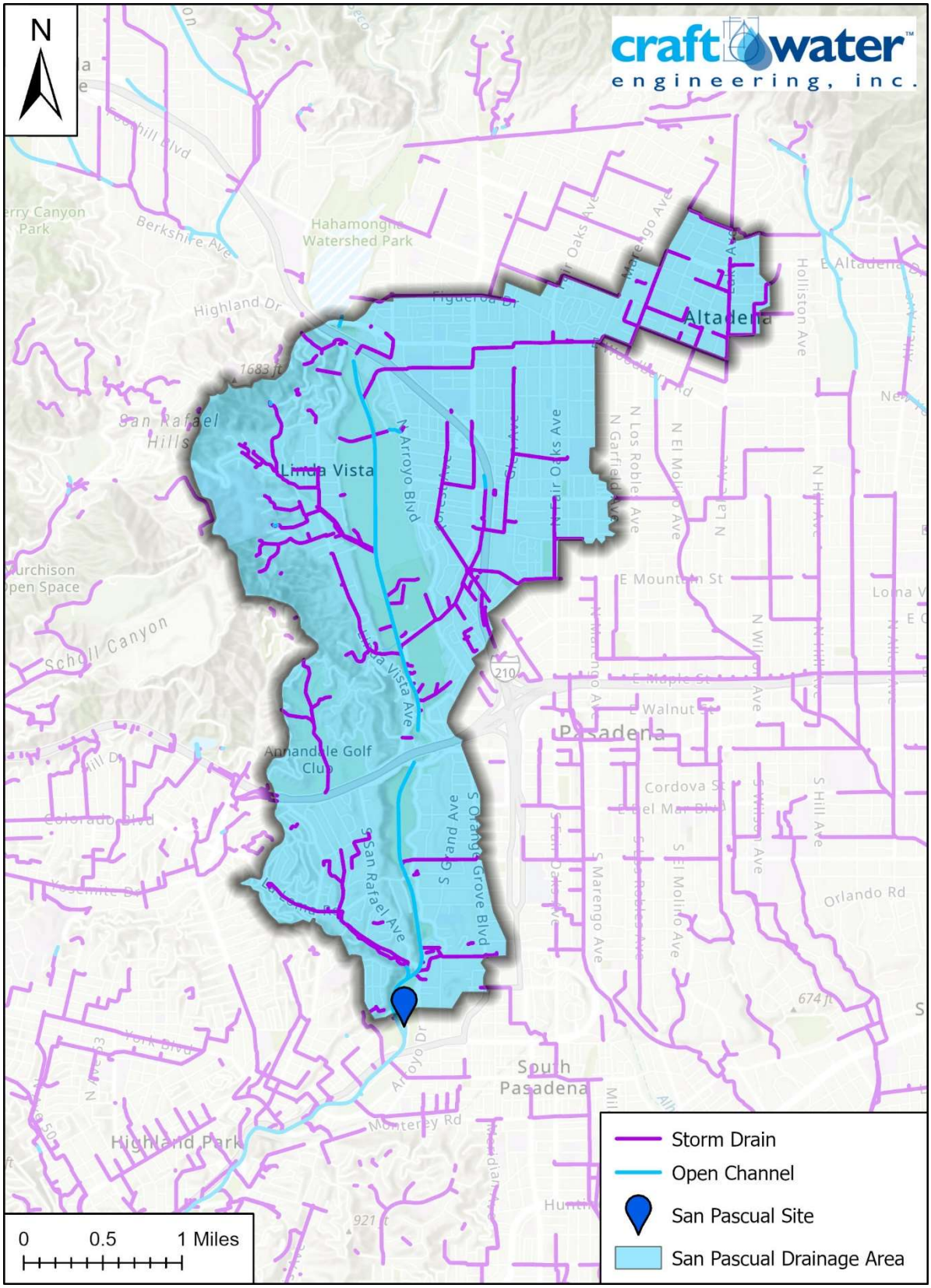


Figure 2-1. Drainage area for San Pascual Project.

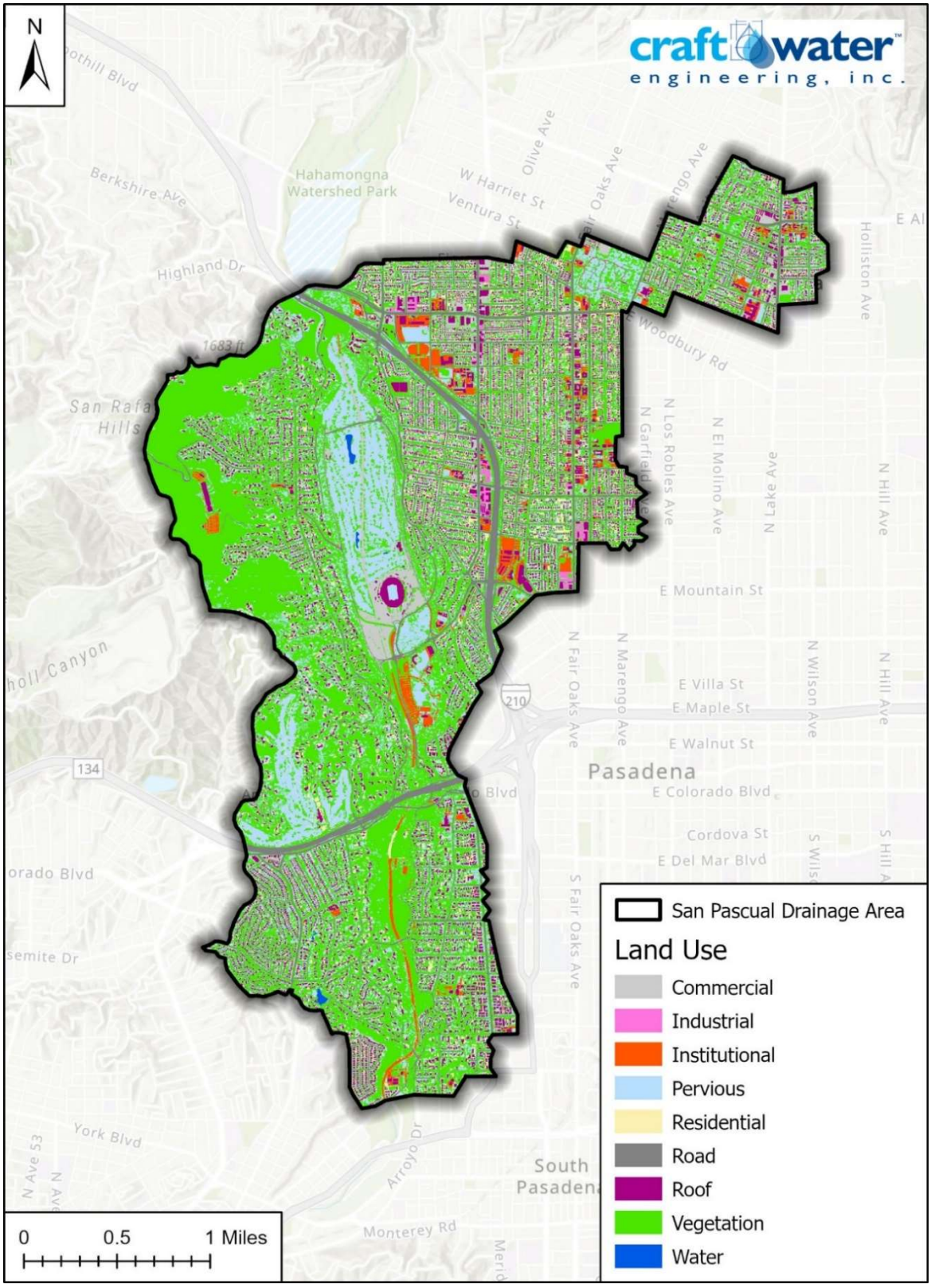


Figure 2-2. Land Uses within the San Pascual Drainage Area.

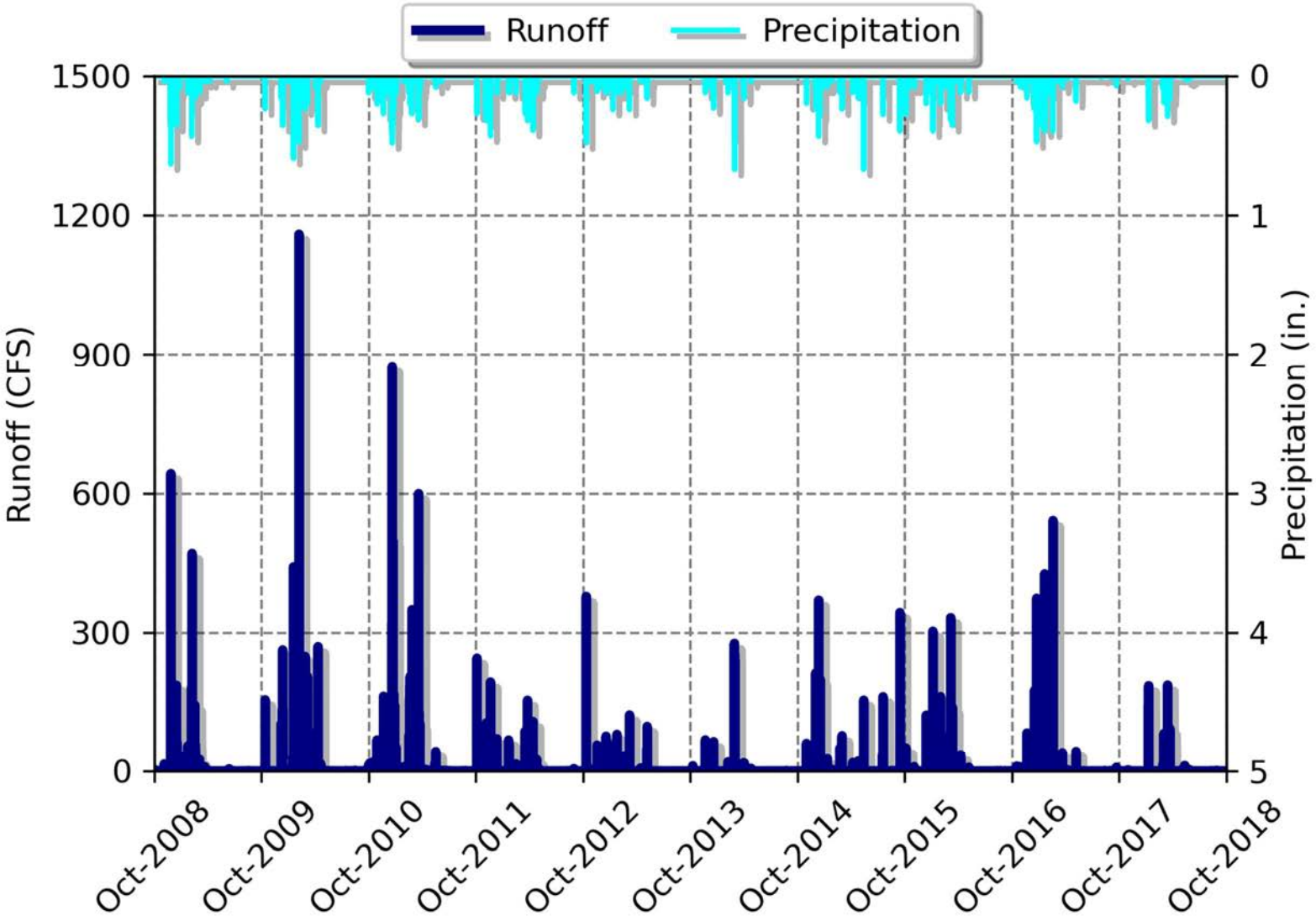


Figure 2-3. Baseline Model Runoff Timeseries for the San Pascual Drainage Area (WY2009-2018)

3.0 STORMWATER CAPTURE OPTIMIZATION METHODS

3.1 Water Quality Optimization Strategy

The primary design goal of the Project is to reduce long-term annual loading of pollutants to the ULAR watershed using zinc as the limiting pollutant of interest in the analysis as established by the EWMP for this watershed group. To ensure that the system will be sized to maximize load reductions in a cost-effective manner, optimization modeling was performed.

As mentioned previously, the BMP storage and footprint were created as part of the Project's 60% level design documents. Therefore, the purpose of optimization modeling in this memo is to balance inflow diversion rates and outflow treatment rates such that it does not limit the performance of the system or negate cost-effectiveness (see **Figure 3-1** at right). Optimization supports decision making throughout the design process by guiding selection of the most cost-effective system design.

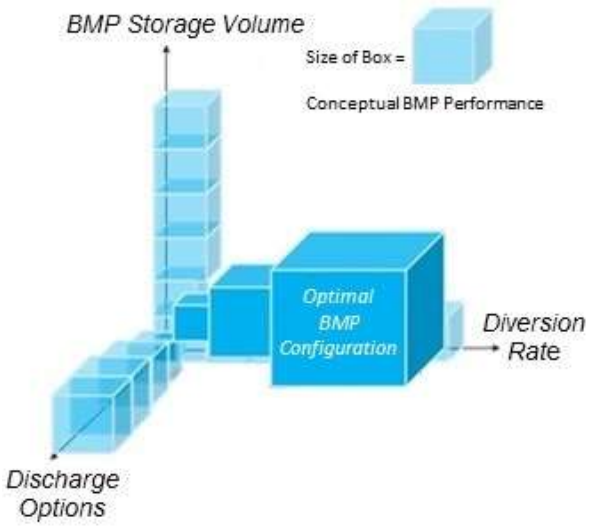


Figure 3-1. Conceptual illustration of optimization modeling balancing various design components to maximize performance.

The model setup for water quality simulation and optimization is complex, involving several modeling systems and iterative feedback from design engineers. The general methodology is discussed below, and the results are presented thereafter.

3.2 BMP Performance Modeling and Diversion Optimization

The first step of the modeling was to predict BMP performance for a range of potential BMP sizes, diversion points, inflow rates, and discharge alternatives. A custom BMP model was used to improve upon certain modeling limitations in EPA's System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN). This custom model is grounded in the physical BMP representations used in SUSTAIN, and it provides built-in optimization algorithms to more systematically automate the process of evaluating many different BMP configurations to select a cost-effective solution related to project goals. The model was run using 10 years of runoff and pollutant loading time-series data generated by LSPC at an hourly time step. During this preliminary decision-support modeling, the discharge alternatives were simulated using certain site constraints to capture approximate BMP throughflow rates. Subsequent targeted modeling then provided a clear decision pathway for the development of optimal project alternatives. Modeling efforts investigated the range of BMP configurations as detailed in the following subsections.

3.2.1 Diversion Rates

Model runs were limited to feasible diversion ranges slightly larger and smaller than previous estimates to ensure prior selection was warranted and kept relatively low as to not overload vegetation and landscaping within the infiltration basins for the proposed diversion point based on prior project knowledge related to the drainage area and potential project storage size. Rates were also minimized considering large pumping costs beyond 20 cfs (See

Section 3.2.5). Diversion rates for the San Pascual BMP were modeled over the range of 5 to 25 cfs, varying in 5 cfs increments, to assess the most cost-effective configuration of diversion inflow rates.

3.2.2 Discharge Alternatives

Different routes exist for the outflows from the BMP, with each entailing differing requirements, infrastructure, and constraints that impact the overall performance of the stormwater capture system and project cost. Additionally, these options represent different contributions to other local water supply efforts, of which stormwater is a growing component.

Irrigation

Project stakeholders provided yearly estimated water demands to irrigate the Arroyo Seco golf course and the nearby Arroyo Park. These values are listed in **Table 3-1**.

Table 3-1. Irrigation Demands Potentially Fulfilled by the San Pascual BMP.

Irrigation Use	Irrigation Demand (ac-ft/yr)
Arroyo Seco Golf Course	30
Arroyo Park	32
Golf Course and Park	***62***

Available runoff would be reserved for irrigation treatment, which would be discharged off-site. How runoff could be stored for irrigation use is further discussed in Section 3.2.3.

Infiltration

Geotechnical investigations indicated substantial infiltration rates at the basin storage depth (approximately 3.3 in/hr with factors of safety applied). While the infiltration rate is set at 3.3 in/hr, the entire basin footprint will not always be used for infiltration. Since the infiltrative area depends on the wetted surface area of the BMP basin, infiltration outflows will vary depending on the amount of runoff stored in the BMP. Section 3.2.4 discusses this aspect of treatment.

Filtration

Several commonly available stormwater filtration devices were also modeled to compare this alternative to infiltration (at 2.88 cfs, 5.76 cfs, and 7.84 cfs discharge rates). These values were chosen to cover a range of potential outflows common to off-the-shelf proprietary filter products. If the desired outflow rate changes, rates can be revaluated in later stages of design. Water treated through filtration would be returned downstream of the diversion point.

Infiltration and Filtration

Dual infiltration and filtration treatment was also analyzed for the San Pascual infiltration basin BMPs. In the combined treatment configuration, diverted flows would first enter the basins to be treated through infiltration. The filter would treat flows stored above a predetermined volume threshold. For example, a filter would only treat flows when a BMP is at least halfway full. Since the chosen filtration rates are comparable to/greater than

infiltration, additional treatment capacity can be added through filtration. This can come at the cost of groundwater recharge, as the filter could now treat flows that were originally reserved for infiltration. Different filter configurations will be analyzed to determine which, if any, are ideal for the project based on SCW goals and cost.

3.2.3 Basin Configurations, Storage Volumes, and Footprints

Site assessments and discussions with project stakeholders have led to the development of a surface infiltration basin BMP made of two distinct cells (**Figure 1-2**). Both basin cells will direct and store dry weather flows for irrigation reuse and infiltrate wet weather flows. The basins will be designed such that incoming flows are distributed evenly between cells. If the first, smaller cell cannot accept any more flow, runoff will continue to accumulate in the second cell. In a standalone filtration scenario, flows would simply exit the second cell through the filter. In a combination configuration, only flow stored above a predetermined threshold would be eligible to enter the filter. For example, filtration would only occur if the BMP was at least 50% full.

Figure 3-2 contains a flow diagram detailing the potential full treatment train of the BMP. While Section 4.0 will determine which exact discharge configuration is optimal for the site, the full treatment train is provided to exemplify where water supply and water quality benefits can be obtained. While complex, the configurations described above allow the San Pascual BMP to provide as many multi-benefits as possible within the site footprint and without violating site constraints. **Table 3-2** also contains the breakdown of storage volume and footprints for these basin cells. These basin storage/footprint configurations were the only ones modeled for this analysis, as it was determined to be the most feasible to construct within the site footprint.

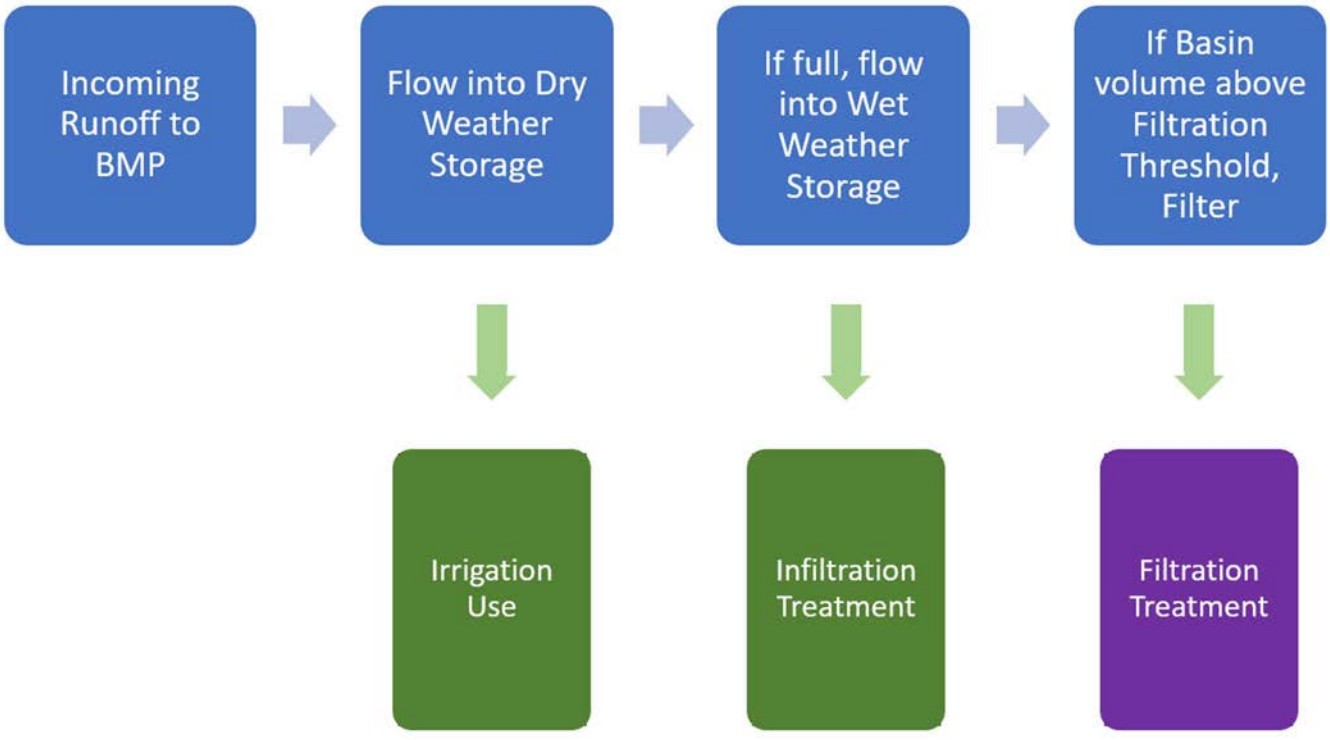


Figure 3-2. Full Potential Treatment Train for the San Pascual BMP.

Table 3-2. Basin Dimensions and Volumes for the San Pascual BMP.

Basin Cell	Top Rim Surface Area (sq. ft)	Bottom Rim Surface Area (sq. ft)	Storage Volume (ac-ft)
1 (Wet-Weather)	13,530	7,020	1.34
1 (Dry-Weather)	1,564	-	
2 (Wet-Weather	27,854	12,525	2.12
2 (Dry-Weather)	8,170	-	
1+2 (Wet-Weather)	-	-	3.46

3.2.4 Safe Clean Water Program (SCWP) and O&M Considerations

When comparing treatment options, three factors must be considered.

- **Outflow Rate —** Filtration devices have set treatment rates that represent the maximum possible throughflow for the device. Infiltration outflow rates are correlated with the available infiltrative footprint. The maximum infiltrative footprint has been set by the basin cell design, but the moment-to-moment infiltrative footprint depends on how much runoff is in a basin cell. **Figure 3-3** demonstrates how an infiltration basin is made up of a maximum and minimum infiltrative area, and how the water level determines how much infiltration can occur. Any runoff stored in the basin increases the wetted surface area, thus increasing the amount of area that is available for infiltration at a given moment. A combination between the two treatment methods would create a BMP with a similar variable infiltrative outflow rate and a design filtration rate.

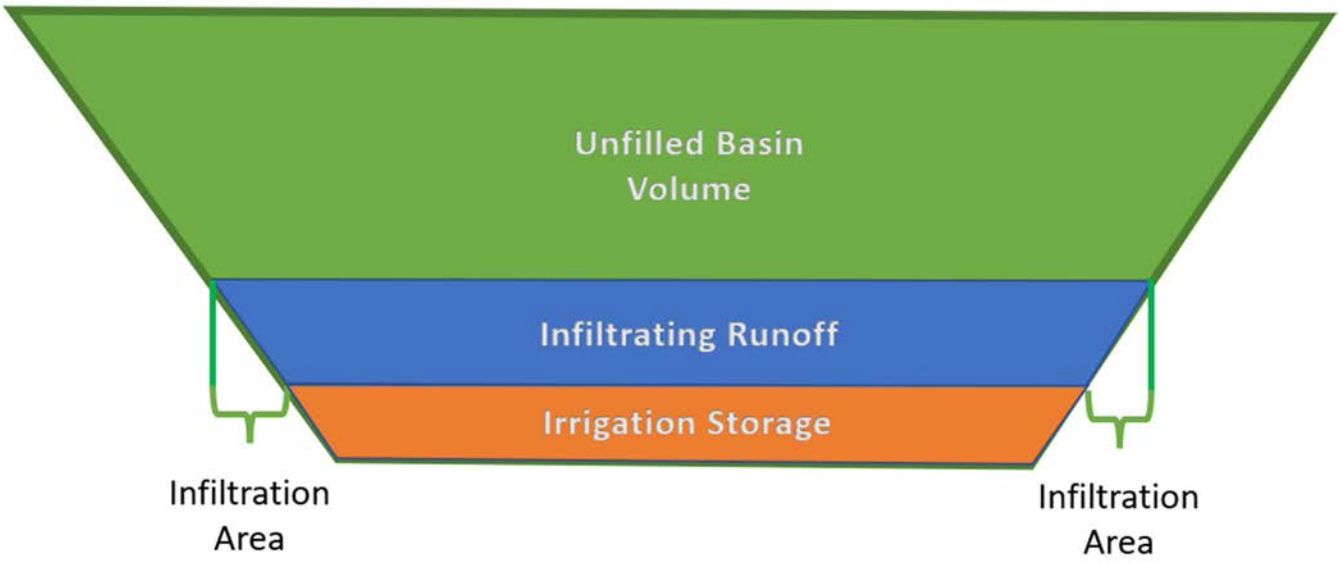


Figure 3-3. Basic Schematic Demonstrating Variable Infiltrative Footprint.

- **Pollutant Removal** — Filtration devices remove most of the pollutants that enter it; physical limitations prevent complete removal. While the effluent concentration is less than incoming loads, it still generally results in a small amount of pollutant leaving the BMP. Infiltrative BMPs, on the other hand, fully

remove all diverted pollutants that enter it. A combination BMP would both completely and partially remove pollutants depending on how much runoff is treated by each method.

- **Water Capture** — Filtration devices will usually return treated stormwater to an adjacent storm drain or channel, which may or may not have the potential for reuse. Infiltrative BMPs recharge groundwater, providing direct benefits to the local groundwater shed. A combination BMP would have less groundwater recharge than an infiltration BMP since filtration would treat runoff normally reserved for infiltration. Water stored in the "Dry-weather" section of the BMP will also contribute to water supply goals since it will be used for irrigation.

Water quality benefits predicted for different BMP configuration options must also be weighed against Safe Clean Water Program (SCWP) scoring criteria to determine the optimal choice for a given site to ensure a Project meets the needs of this important regional program. The following SCWP scoring categories are primarily dependent on the proposed treatment type:

- **Wet Weather vs. Dry Weather BMP:** Does the proposed BMP capture the 85th percentile storm of the targeted drainage area? If so, it is historically defined as a wet weather project per the SCWP Scoring Committee. Otherwise, it is a dry weather BMP. Wet Weather and Dry Weather BMPs have different water quality scoring criteria, as detailed blow. Both BMP types can still fulfill all other project related SCW scoring criteria (Water Supply, Community Investment, etc.)
- **Water Quality**
  - *Wet Weather BMP:* Removal of 50%/80% of divertible pollutants.
  - *Dry Weather BMP:* Removal of 100% of all tributary dry weather flows
- **Water Supply**: Utilizing captured stormwater to replenish local water supply (water reclamation and groundwater recharge).
  - Scoring thresholds for SCW occur at 25, 100, 200, and 300 ac-ft of water supply benefit.
- **Nature Based Solutions**: Implement or mimic natural processes to treat stormwater (infiltration).

Table 3-3 details key cost and scoring aspects that are both consistent among and differentiate between the various modeled options presented in this memo.

Table 3-3. Summary of key cost components and SCW scoring criteria for different discharge options.

Cost applicable to….	Key Cost Components	O&M Cost Components	Relevant SCW Scoring Criteria
All Options	Diversion Infrastructure, Pretreatment, Optional Pump	Inspection, Sediment Removal, Pumping Maintenance/Electricity	---
Infiltration	Excavation, Basin Construction	Landscaping Maintenance	Water Supply AND Water Quality
Filtration	Excavation, Basin Construction, Filtration Unit(s)	Landscaping Maintenance, Filter Cartridge Cleaning	Water Quality ONLY
Combination	Excavation, Basin Construction, Filtration Unit(s)	Landscaping Maintenance, Filter Cartridge Cleaning	Water Supply AND Water Quality

3.2.5 Inflow Infrastructure

Diverted inflows can be conveyed to the storage BMP via gravity-fed pipes or by way of pumps. The two options have tradeoffs associated with costs that are typically defined by the invert depth of the storm drains at the diversion points and the BMP storage footprint. Gravity-fed inflows require the BMP to be sited deep enough underground for flows to move passively toward the storage. This is associated with excavation and stabilization costs that are determined by the storm drain invert and distance of the diversion. Pumped inflows allow the BMP to be sited vertically with minimal soil cover, but are associated with costs of pumping infrastructure, operation, and maintenance. At different sizes of a given BMP and site, pumping inflows may be more cost-effective than gravity-fed diversions, and vice versa. ***To minimize site-specific excavation and project costs, a pumped diversion will be used at the site.***

4.0 OPTIMIZATION MODELING RESULTS

The optimization analysis aimed to maximize the long-term pollutant load reduction and 85th percentile design storm volume capture by simultaneously varying the diversion rate and discharge rates related to options previously discussed. Each of these design features has an associated range of options that were modeled to assess alternatives against long-term water quality benefits and identify the most effective configuration. Different configuration alternatives and modeling parameters are presented below to demonstrate the cost-effectiveness associated with these options and narrow them down to a recommended project configuration that will meet different needs for the ULAR watershed.

4.1 Outflow Options

4.1.1 Irrigation Outflow

Irrigation demands for the golf course and park are more than three times smaller than the modeled dry-weather flows. Since these dry-weather flows would quickly fill up the dry-weather storage component of the BMP, there will always be flow into the wet-weather storage component. Thus, irrigation drawdown is effectively accounted for if flows equal to or greater than the irrigation demand are truncated from the BMP inflow timeseries. The following treatment type analysis (Section 4.1.2 through 4.2) will not include irrigation for the sake of simplicity and to see differences more easily between treatment types instead of irrigation configuration. Final performance numbers utilizing infiltration before other treatment are listed in Section 5.0.

If irrigation reuse is highly desired here, it is advised that further study of the availability of dry-weather flows be conducted, and these results be compared to historic on-site water use before any decision is made regarding the inclusion of filtration and irrigation systems. Should monitoring corroborate better availability and storage of flows, the costs of filtration equipment, irrigation system upgrades, and associated O&M activities should be weighed throughout design processes to determine if this discharge option is desirable for the Project.

4.1.2 Infiltration and Filtration Outflow

All singular treatment outflow options were modeled across all diversion rate scenarios (5-25 cfs), with average values of performance presented in **Table 4-1**.

Overall, increasing the filtration rate increases total pollutant removal. *Improvements in filtration performance do not severely decline before 7.84 cfs filtration, so the largest filter rate should be used for the project's drainage area.* However, none of the runoff treated through filtration would contribute to groundwater recharge goals. *Infiltration treatment alone is comparable to 2.88 cfs filtration treatment, but it also provides water supply benefits that filtration alone would not.* However, an infiltrative practice could still benefit from filtration to further increase total treatment. **Table 4-1** also contains the average performance of the combination infiltration basin and 7.84 cfs filtration BMP for the San Pascual site. While adding this filter would incur approximately 400K of additional project cost, this addition does not cause the project to exceed previously determined total cost estimates submitted in a previous SCWP application. The extra protection it could provide would increase overall cost-effectiveness by treating runoff that a standalone infiltration BMP could not.

All possible diversion rates were analyzed for an optimized filtration and infiltration BMP configuration that balances water supply and water quality benefits. As mentioned earlier (Section 3.2.2), the total runoff infiltrated is subject to change when a combination treatment BMP is used. There is less filtration runoff treatment in a combination configuration than standalone filtration because it only treats flows when there is enough flow stored in the BMP. There is also less groundwater recharge than standalone infiltration since some of the runoff stored is no longer reserved for infiltration.

While filtration has a higher flowrate than infiltration, groundwater recharge is not seriously impacted with a filter because of the volume of divertible flows available compared to BMP treatment capacity. As mentioned previously, the San Pascual BMP footprint and volume was primarily driven by site constraints. While this BMP treats as much runoff as possible within the site footprint, it is not necessarily right sized to treat all incoming flows. For example, the standalone infiltration BMP bypasses over 200 ac-ft of flows per year. If it had a larger outflow rate, then there are opportunities for additional treatment. Altogether, while filtration removes flows normally reserved for infiltration, the impact does not overly reduce recharge since there is still an abundance of flows that still fill the BMP. On average, the combination BMP treats more total runoff and pollutants than all other singular outflow options. ***Therefore, a combination infiltration basin and 7.84 cfs filtration BMP should be used for the San Pascual site to maximize the total amount of runoff treated for the large drainage area.***

Table 4-1. Average Performance of BMP Treatment Types across all Diversion Rates.

Outflow Type	Outflow Rate	Avg. Annual Runoff Filtered (ac-ft)	Avg. Annual Runoff Infiltrated (ac-ft)	Avg. Annual Total Runoff Treated (ac-ft)	Avg. Annual Zinc Removal (lbs)
Infiltration	3.3 in/hr	0.0	357	357	101
Filtration	2.88 cfs	384	0.0	384	75.5
	5.76 cfs	456		456	102
	7.84 cfs	486		486	115
Infiltration and 7.84 cfs Filtration	3.3 in/hr 7.84 cfs	192	308	501	147

4.2 Diversion Rate

Diversion rates were varied to get a sense for what the most effective flowrate into the BMP should be. BMP performance is a balance between inflow, storage, and outflow, so diversion rates should not be chosen in isolation of these other BMP configuration variables. Overall, increasing diversion rates increased treatment capacity across all discharge configurations. However, these improvements severely declined after 15 cfs. While larger diversions offer more pollutant removal, they often warrant larger storage volume—and therefore cost—for only slight improvements in water quality benefit. Additionally, there is an existing diversion pipe and structure that can be modified to accommodate a 15 cfs diversion into the BMP. Doing so would reduce costs since it would eliminate new construction of a diversion. ***Therefore, a 15 cfs diversion rate is the most cost-effective for the San Pascual site.***

Table 4-2. Performance of the San Pascual Combination BMP with Various Diversion Rates.

Diversion Rate	Avg. Annual Runoff Filtered (ac-ft)	Avg. Annual Runoff Infiltrated (ac-ft)	Avg. Annual Total Runoff Treated (ac-ft)	Avg. Annual Zinc Reduction (lbs)
5	108	298	406	104
10	202	304	506	150
15	216	313	529	165
20	217	313	531	160
25	218	313	532	158

5.0 PROJECT ALTERNATIVES AND RECOMMENDATIONS

5.1 Capture of 85th Percentile Design Storm and Dry Weather Flows

Based on the infiltration rate of 3.3 in/hr for this project, capture of the 85th percentile storm volume is not feasible at the site given the previously developed footprint. Therefore, the San Pascual BMP will be designated as a dry-weather BMP under SCWP scoring criteria. **Table 5-1** displays the design storm performance of the combination BMP with a 15 cfs diversion. ***The San Pascual Combination BMP cannot capture the 85th percentile design storm, thus designating it as a "dry-weather" project under SCWP scoring criteria.***

Table 5-1. Design Storm Performance of the San Pascual Combination BMP with a 15 cfs Diversion.

Design Storm Volume (ac-ft)	Design Storm Peak Flow (cfs)	Filtered Volume (ac-ft)	Infiltrated Volume (ac-ft)	Volume Treated (ac-ft)
58.2	85.9	14.6	6.5	21.1 (36%)

Dry-weather flows are defined as any flows that occur in a period which is at least 24 hours since the last rainfall occurrence. Average annual dry-weather flow volumes, pollutant loading, and average flow rate are presented in **Table 5-2**. As mentioned previously, dry-weather BMPs must treat 100% of all tributary dry-weather flows. It is sufficient to say that the San Pascual BMP fully treats 100% of all dry-weather flows if the long-term performance matches or exceeds the dry-weather minimum.

Table 5-2. Dry Weather Flow Characteristics for the San Pascual BMP Drainage Area.

Average Annual Dry-Weather Flows (ac-ft)	Average Annual Dry-Weather Zinc Load (lbs)	Average Dry-Weather Flow (cfs)
230	37.7	0.34

5.2 Long-Term Performance of the San Pascual site

Table 5-3 summarizes the long-term performance of the San Pascual BMP using a 15 cfs diversion, irrigation, infiltration, and 7.84 cfs filtration treatment for the established basin design. The given design treats all dry-weather flows, achieves over 300 ac-ft of groundwater recharge, and removes over 70% of divertible pollutants on an average annual basis. Therefore, the basin design established by the 60% design level documents can provide multiple benefits and treat an appreciable amount of runoff and pollutants from the drainage area.

Table 5-3. Average Annual Performance of the Selected San Pascual Combination BMP.

Stormwater Filtration (ac-ft)	Irrigation Reuse (ac-ft)	Groundwater Recharge (ac-ft)	Water Supply Benefit (ac-ft)	Total Runoff Treated (ac-ft)	Avg. Annual Zinc Reduction (lbs)
214	62	258	320	534	157 (74%)

6.0 CONCLUSIONS

This Stormwater Capture Memo was prepared for the San Pascual Stormwater Capture Facility Project to demonstrate progress towards compliance for the ULAR region. The existing hydrology and water quality conditions were first characterized for the drainage area. Site analysis and conversations with Project stakeholders yielded a set basin design for the San Pascual site. ***This basin BMP design has a total footprint of approximately 0.73 acres and a storage volume of 3.46 ac-ft.*** Then, an optimization analysis informed data-driven selection of appropriate diversion rates and treatment methods. ***From this analysis, a combination infiltration and 7.84 cfs filtration basin BMP with irrigation reuse using a 15 cfs pumped diversion was selected as the recommended San Pascual BMP configuration***. This BMP can treat 100% of dry-weather flows while also removing over 70% of divertible pollutants and providing over 300 ac-ft of water supply benefits. The performance of the feasible BMPs demonstrate that long-term pollutant reduction targets can be achieved based on several key compliance metrics, including average-annual reduction (from which the BMP's operating parameters were optimized). These performance estimates will contribute to pollutant reduction initiatives in the larger watershed.

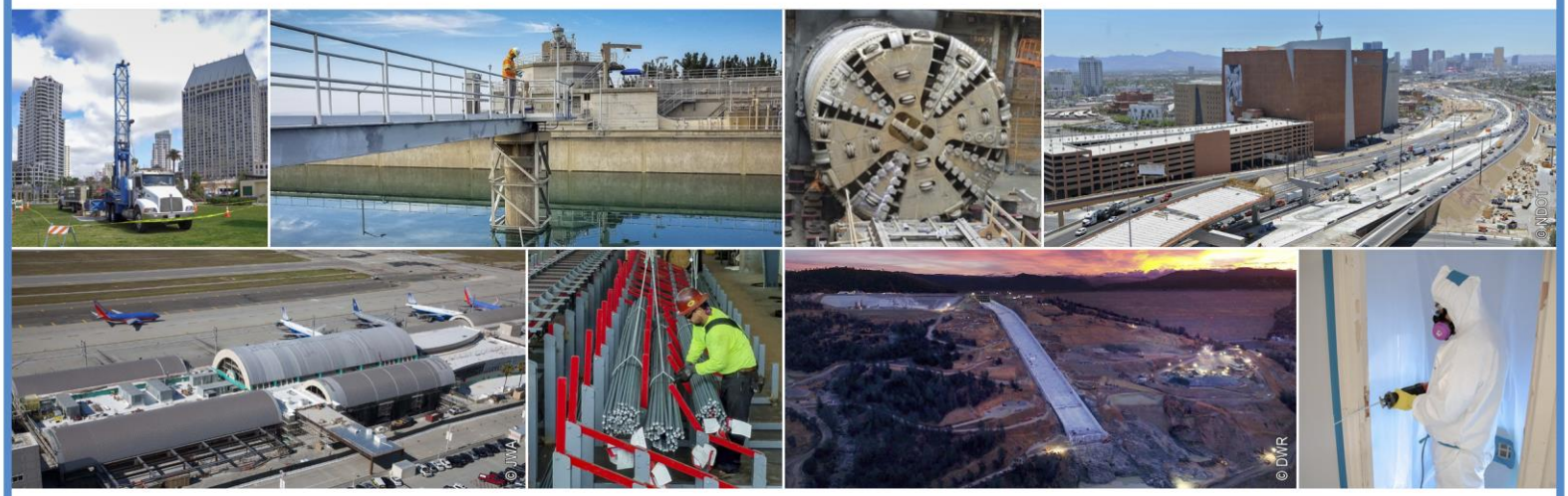
Appendix F-1

San Rafael Geotechnical Evaluation

Geotechnical Evaluation
San Rafael Treatment Wetland
Arroyo Seco Water Reuse and Natural Stream Restoration Project
Pasadena, California

Craftwater Engineering, Inc.
45 South Arroyo Parkway, B6 | Pasadena, California 91105

June 22, 2022 | Project No. 211880001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

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Geotechnical Evaluation
San Rafael Treatment Wetland
Arroyo Seco Water Reuse and Natural Stream Restoration Project
Pasadena, California

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1 INTRODUCTION

In accordance with your request and authorization, we have performed a geotechnical evaluation for the Arroyo Seco Water Reuse and Natural Stream Restoration project located along the lower Arroyo Seco in the Cities of Pasadena and South Pasadena, California (Figure 1). We understand that the purpose of the project is to reduce the Maximum Total Daily Loads within the Upper Los Angeles River by improving the water quality within Arroyo Seco and its tributary, San Rafael Creek. In general, the project consists of the construction/rehabilitation of two stormwater treatment wetlands along Arroyo Seco, including the San Rafael Treatment Wetland and the San Pasqual Treatment Wetland. Each wetland location will include additional site improvements, such as stormwater diversion structures, stormwater pre- and post-treatment facilities, restoration of existing riparian habitats, and development of recreational opportunities. The purpose of our study was to evaluate the subsurface soil and geologic conditions at each wetland location, including the infiltration rates of the on-site soils, in order to provide geotechnical recommendations for the design and construction of the proposed improvements. This report presents our findings, conclusions, and geotechnical recommendations for design and construction of the proposed improvements at the site of the San Rafael Treatment Wetland (San Rafael Site). Our findings, conclusions and geotechnical recommendations associated with the site of the San Pascual Treatment Wetland (San Pascual Site) are provided under separate cover (Ninyo & Moore, 2022).

2 SCOPE OF SERVICES

Our scope of services for the San Rafael Site included the following:

- Project coordination and planning with subcontractors and personnel from Craftwater Engineering, Inc. the design team, the Cities of Pasadena and South Pasadena, and attendance at a project kick-off meeting.
- Review of readily available background materials, including published topographic maps, geologic maps, fault and seismic hazard maps, groundwater data, stereoscopic aerial photographs, project related plans, and in-house geotechnical information.
- Acquisition of a Pasadena Water and Power soil-boring permit.
- Field reconnaissance to observe and document the site conditions, mark-out proposed hollow-stem-auger (HSA) boring locations for underground utility clearance by Underground Service Alert.
- Subsurface exploration consisting of the drilling, sampling, and logging of six HSA borings, ranging in depths from approximately 10 feet to 31½ feet.
- Field percolation testing in two of the HSA borings in general accordance with the 2021 Los Angeles County Public Work's (LACDPW) Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration.

- Geotechnical laboratory testing of representative soil samples to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve, Atterberg limits, direct shear strength, and soil corrosivity.

- Data compilation and engineering analysis of the information obtained from our background review, subsurface evaluation, percolation testing, and laboratory testing.

- Preparation of this geotechnical report presenting our findings, conclusions, and recommendations pertaining to the design and construction of the proposed improvements.

3 SITE DESCRIPTION

The San Rafael Site consists of a triangular-shaped, undeveloped lot located along the bottom of a steeply sided canyon cut though the Repetto Hills by Arroyo Seco and its tributaries. The site is located at the confluence of San Rafael Creek and Arroyo Seco (Figures 1 and 2). The lot is bounded on the west by San Rafael Creek, on the southeast by the Arroyo Seco channel, and on the north by an approximately 70-foot-high slope that ascends to a residential property. The confluence of the drainages is at the southwest corner of the site. The lower approximately 30 vertical feet of the north slope has an inclination that decreases from approximately 1.3 to 1.5:1 (horizontal to vertical) in its upper reaches to approximately 3:1 (horizontal to vertical) near the base of the slope. The upper approximately 40 vertical feet of the slope ranges from 0.5:1 to 0.8:1 (horizontal to vertical) with some near vertical sections along a bedrock outcrop that extends across the slope face, approximately mid-slope height. The channels of Arroyo Seco and San Rafael Creek are concrete-lined adjacent to the site, drain toward the south, and are approximately 10 and 5 feet in depth, respectively. The site is accessed by two bridges that cross each drainage channel. According to the County of Los Angeles (2022), the site gently slopes downward toward the southwest with site elevations ranging from 626 feet above mean sea level (MSL) along the base of the slope at the north end of the site to approximately 621 feet MSL at the southwest corner of the site. The site surface is generally areas of bare soil and relatively dense vegetation of bushes, grasses, and trees.

4 PROJECT DESCRIPTION AND PROPOSED CONSTRUCTION

According to Craftwater (2020), the site will be improved to become a new wetland with storage ponds that will treat and infiltrate wet weather flow diverted from San Rafael Creek. The new wetland and ponds will have a storage capacity of approximately 2.6 acre-feet, based on a ponding depth of approximately 5 feet over a footprint of approximately 0.52 acres. It is anticipated that ponds will be bounded by shallow slopes. Water will be diverted from the San Rafael Creek with a new approximately 12-foot-long by 3-foot-wide by 1.5-foot-deep concrete diversion/drop-inlet structure installed along the bottom of the San Rafael Creek at the northwest corner of the

site. Stormwater collected by the inlet structure (up to 25 cubic feet per second) will be diverted to the wetland by a 30-inch-diameter pipeline with an in-line hydrodynamic separator for pre-treatment of the water and a 3-way actuated valve vault. Dry weather stormwater flow along San Rafael Creek will be directed to a new natural stream that will be constructed on top of the lower reach of the concrete channel (approximately 190 feet in length). A new reinforced concrete slab will also be installed to cover the lower reach of the channel. Overflow from the wetland will be discharged into Arroyo Seco by an 18-inch-diameter pipeline with an in-line post-treatment structure at the southeast side of the site. A 12-inch dry weather discharge pipeline will be constructed at the southwest end of site. It is anticipated that the pipelines and valve structure will generally be less than 10 feet in depth. The pre- and post-treatment hydrodynamic separators are anticipated to be on the order of 15 feet in depth. Other site improvements include the removal and reconstruction the pedestrian bridge over San Rafael Creek and the construction of new enhanced trails and landscaping.

5 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our subsurface evaluation was conducted on April 27, 2022, and consisted of the drilling, logging, and sampling of five HSA borings (B-1, B-2, B-3, P-1 and P-2). The borings were drilled using a limited-access drill rig with 8-inch diameter augers. Borings B-1, B-2, and B-3 were drilled to depths of approximately 30.4, 18.6, and 30.2 feet, respectively. Borings P-1 and P-2 were drilled to depths of approximately 10.2 and 10.1 feet, respectively. The borings were logged in the field by a representative of Ninyo & Moore and representative bulk and relatively undisturbed soil samples were collected from the borings at selected depths for laboratory testing. Percolation testing was performed in borings P-1 and P-2 as further discussed in Section 8 of this report. Logs of the exploratory borings are provided in Appendix A. The approximate locations of the borings are presented on Figures 2 and 3. The borings were backfilled with cement-bentonite and/or soil cuttings upon completion of the drilling and percolation testing.

Geotechnical laboratory testing of representative soil samples included tests to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve, Atterberg limits, direct shear strength, and soil corrosivity. Moisture and density test results are presented on the boring logs in Appendix A. The remaining test results are presented in Appendix B.

Soil cuttings from borings backfilled with cement-bentonite grout were placed in 55-gallon drums, and composite soil samples of the drummed soil were collected in 4-ounce jars for waste characterization. The samples were stored in a chilled cooler and delivered to SunStar Laboratories for analytical testing under chain-of-custody protocol. The samples were tested for

total petroleum hydrocarbons (gas and diesel range) per United Stated Environmental Protection Agency (EPA) Test Method 8015B, Title 22 metals per EPA Test Methods 6010B/7470/7471, and volatile organic compounds per EPA Test Method 8260B. Based on the characterization test results, the drums were disposed at an approved landfill (Soil Safe in Adelanto, California) by a licensed transportation subcontractor (Belshire) as non-hazardous material. The analytical test results are provided in Appendix C.

6 GEOLOGIC AND SUBSURFACE CONDITIONS

The project site is located within the Los Angeles Basin of the Transverse Ranges Geomorphic Province (Norris and Webb, 1990). The basin has been divided into four blocks, the northeastern, northwestern, southwestern, and central blocks that are separated by prominent fault systems. The site is located at the northern edge of the northeastern block, which consists of a synclinal basin between the San Gabriel and Verdugo Mountains to the north and Whittier fault zone to the south. The basin is infilled with up to 12,000 feet of marine Cenozoic sedimentary rock and Miocene volcanics overlying metamorphic/granitic basement rock. The basin rocks are generally overlain by variably aged alluvial fan and stream deposits shed from the mountains on the north.

According to Campbell, et al. (2014), the project site is generally underlain by late Pleistocene-age young alluvium and a sandstone unit of the Topanga Formation (Figure 4). The young alluvium is mapped along the bottoms of the San Rafael and Arroyo Seco drainages and described by Campbell, et al. (2014) as unconsolidated, stream-deposited silt, sand and gravel. The California Department of Mines and Geology (CDMG, 1998a,b) has mapped the young alluvium as Holocene-aged deposits consisting of loose to medium dense, sand, silt and gravel. Campbell, et al. (2014) has mapped the sandstone unit of the Topanga Formation beneath portions of the site and within the adjacent hills on either sides of the drainages and described it as light brown and gray, medium to coarse grained, well-bedded, sandstone with regional dips of approximately 31 to 77 degrees to the northeast. It is anticipated that similar bedrock is present beneath the younger alluvium at variable depths. Campbell, et al. (2014) also indicate that the bedrock in the area. It is anticipated that various fills associated with original construction of the Arroyo Seco and San Rafael Creek channels and bridge structures are present at the site.

Materials encountered during our subsurface exploration generally consisted of undocumented fill, young alluvium, and Topanga Formation bedrock as described below. Detailed descriptions of the materials encountered in our borings are presented on the boring logs in Appendix A.

6.1 Undocumented Fill

Undocumented fill was encountered in our borings to depths ranging from approximately 3 to 5 feet. The undocumented fill generally consisted of brown, dark brown, reddish brown, moist, medium dense, poorly graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and debris (i.e., pieces of brick, asphalt concrete, glass and plastic). Information regarding the placement of existing fill including ground preparation, remedial excavation, methods of fill placement, and the degree of compaction during placement is unknown to us.

6.2 Young Alluvium

Young alluvium was encountered beneath the undocumented fill to the total depth explored in borings P-1 and P-2 and to depths ranging from approximately 14 to 19 feet in borings B-1 through B-3. The young alluvium generally consisted of interbedded deposits of brown, grayish brown, and light brown, moist to wet, loose to very dense, poorly graded gravel with sand and well-graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and possible boulders.

6.3 Topanga Formation

Topanga Formation bedrock was encountered below the young alluvium in boring B-1, B-2, and B-3 to the total depth explored of up to approximately 30.4 feet. The Topanga Formation generally consisted of gray, moist to wet, soft to moderately hard, weakly to moderately cemented, silty sandstone with variable amounts of gravel.

7 GROUNDWATER

Groundwater was encountered during drilling in boring B-3 at a depth of approximately 15 feet. The depth to groundwater was measured in boring B-3 approximately 25 minutes after completion of drilling at a depth of approximately 13.6 feet. CDMG (1998a,b) indicates that the historic high depth to groundwater at the project site is approximately 20 feet. It would be anticipated that the depth to groundwater would be shallower than this published historic high depth to groundwater adjacent to the stream beds where surface flows occurs, especially during and after storm events.

Fluctuations in the level of groundwater will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors that were not evident at the time of our field evaluation.

8 FIELD PERCOLATION TESTING

Percolation testing was performed in our borings P-1 and P-2 in general accordance with the 2021 LACDPW Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration. The testing was performed to evaluate the infiltration rates of the on-site soils at the approximate invert depth of the proposed wetland for use in the project design. The percolation testing was performed within the young granular alluvial deposits. The approximate locations of the percolation test borings are shown on Figures 2 and 3.

Preparation of each boring for percolation testing included the installation of a 2-inch-diameter slotted polyvinyl chloride (PVC) pipe in each boring and backfilling the bottom approximately 5 feet of annular space between the borehole wall and pipe with clean gravel. The infiltration zones were pre-soaked with water for at least one hour prior to performing percolation testing. After the borings were pre-soaked, falling-head percolation testing was performed in the borings.

The falling-head test method involved placing clean water into the PVC pipe to establish a head of water and measuring the rate at which the water level dropped in the pipe at consecutive time intervals (approximately 10 minutes). The test was repeated at each location until three consecutive measurements provided similar results and a stabilized rate was obtained. The field percolation rates were calculated by measuring the total volume of water infiltrated during the time interval and dividing by the surface area of the tested zone of the respective boring. The measured field percolation rates are presented in Table 1.

The 2021 LACDPW guidelines indicate that the measured field percolation rates should be reduced to account for the long-term performance of the proposed Best Management Practices (BMPs) by dividing the field rates by the “Total Reduction Factor (RF).” They define the RF as the sum of the "test-specific" reduction factor (RF_t), the "site variability" reduction factor (RF_v), and the "long-term siltation, plugging, and maintenance" reduction factor (RF_s) (i.e., $RF=RF_t+RF_v+RF_s$). The guidelines (CLADPW, 2021) indicate that the RF_t is applied to account for variations in the direction of flow during the test and the reliability of the different test methods and ranges from 1 to 3. We recommend using an RF_t value of 2 for the small dimeter boring test method used in this evaluation. The RF_v value is applied to account for site variability, number of tests, and thoroughness of the subsurface investigation and ranges from 1 to 3. Based on our explorations and relative consistency of materials encountered between borings, we recommend using an RF_v value of 1. The long-term siltation, plugging, and maintenance value (RF_s) also ranges from 1 to 3 and will generally vary on the level of pre-treatment performed prior to infiltration and the level of future maintenance of the system. For the purposes of this evaluation, we have assumed an RFs value of 1; however, the RF_s value should be provided by the BMP

designer. The RF_t, RF_v, RF_s, and resulting RF values used in our analysis are presented in Table 1. The adjusted percolation rates based on these values are also presented in Table 1.

Table 1 – Percolation Test Results

Test Boring	Test Type	Approximate Depth of Tested Zone (feet)	Field Percolation Rate (inches/hour)	Reduction Factor				Adjusted Percolation Rate (inches/hour)
				RF_t	RF_v	RF_s	RF	
P-1	Falling Head	8 – 10	15.1	2	1	1	4	3.8
P-2	Falling Head	8 – 10	11.6	2	1	1	4	2.9

Notes:
RF_t – Test Specific Reduction Factor
RF_v – Site Variability Reduction Factor
RF_s – Long-Term Siltation, Plugging, and Maintenance Reduction Factor (To be adjusted by the BMP designer)
RF – Total Reduction Factor

Based on our evaluation, we recommend that an adjusted percolation rate of 2.9 inches per hour, following adjustments by the BMP designer for RF_s, be used for project design.

In addition, we recommend that new or existing buildings be set-back from the proposed infiltration facility a minimum of 15 feet or a distance where the bottom of the lowest foundation element of the structure is at least 10 horizontal feet outside of an imaginary 1:1 (horizontal to vertical) plane projected downward and outward from the zone of infiltration.

9 FLOOD HAZARDS

Based on our review of flood insurance rate maps for the project area (Federal Emergency Management Agency [FEMA], 2008), the project site is not located in the 100-year Flood Hazard Area. The site is located within "Other Flood Areas – Zone X," which includes areas potentially subject to 500-year floods, areas of 100-year floods with average depths of less than one foot, and areas protected by levees.

10 FAULTING AND SEISMICITY

The site is in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered significant during the design life of the proposed project. Figure 5 shows the approximate site location relative to the major faults in the region. The site is not located within a State of California Earthquake Fault Zone (EFZ) (formerly known as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 2018). The nearest mapped active fault to the site is the Raymond fault located approximately 0.4 mile south of the site (United States Geological Survey [USGS], 2008) (Figure 5).

The principal seismic hazards evaluated at the subject site are surface fault rupture, ground motion, liquefaction, and seismically induced landslides. A brief description of these principal seismic hazards is discussed in the following sections.

10.1 Surface Fault Rupture

Surface fault rupture is the offset or rupturing of the ground surface by relative displacement across a fault during an earthquake. Based on our review of referenced geologic and fault hazard data, the project site is not transected by known active faults. Therefore, the potential for surface rupture is relatively low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

10.2 Ground Motion

Considering the proximity of the site to active faults capable of producing a maximum moment magnitude of 6.0 or more, the project area has a high potential for experiencing strong ground motion. The 2019 California Building Code (CBC) specifies that the risk-targeted maximum considered earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The average shear wave velocity (V_S) for the upper 30 meters of soil (V_{S30}) is approximately 468 meters per second (m/s) (California Geologic Society [CGS], 2017). Accordingly, the site is considered to be a Site Class C. The horizontal peak ground acceleration that corresponds to the MCE_R for the project area was calculated as 0.92g using the 2019 Structural Engineers Association of California (SEAOC)/Office of Statewide Health Planning and Development (OSHPD) seismic design tool (web-based). Spectral response acceleration parameters, consistent with the 2019 CBC, are also provided in Section 12.3 for the evaluation of seismic load on the proposed wetland.

The 2019 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the mapped maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA_M) with adjustment for site class effects in accordance with the American Society of Civil Engineers 7-16 Standard. The MCE_G PGA is based on the geometric mean PGA with a 2 percent probability of exceedance in 50 years. The PGA_M was calculated as 1.1g using the 2019 SEAOC/OSHPD seismic design tool (web-based).

10.3 Liquefaction

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35 percent and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure and causes the soil to behave as a fluid for a brief period of time. Liquefaction is known generally to occur in saturated or near saturated cohesionless soils at depths shallower than 50 feet. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The State of California Hazard Zones map (CGS, 2017 and 2022a,b) indicates that the southern portion of the site is located in an area mapped as being potentially susceptible to liquefaction (Figure 6). However, based on our understanding of the proposed improvements and the fact that the project does not meet the requirements of a “project” per the Seismic Hazards Mapping Act, an evaluation of the potential for liquefaction and liquefaction-related risks, including dynamic settlement and lateral spread were not included in our evaluation. In addition, due to the existence of shallow formational material it is our opinion that soil liquefaction is not a design consideration for this project.

10.4 Landslides and Rockfall Hazard

Our evaluation did not include a detailed evaluation of the landslide or rockfall susceptibility or stability of the natural slopes adjacent to the project. Our review of geologic literature indicates that landslides are not present on the slopes adjacent to the site (Figure 4); however, the ascending slopes along the north side of the site and west of Rafael Creek are mapped as being susceptible to earthquake-induced landslides (CGS, 2017 and 2022a,b) (Figure 6). According to Campbell, et al. (2014), bedding in the area dips to the northeast, which is considered favorable for stability of the slope along the north side of the site. The proposed project improvements are situated on relatively flat and gently sloping ground areas underlain by fill and alluvial deposits, which are not considered susceptible to landslides. The evaluation of potential landslide and rockfall hazards associated with the adjacent steep canyon slopes was beyond the scope of our evaluation.

In general, it is anticipated that excavations made to construct the site improvements will be shallow in nature and not extend into the toe of the slope. Detailed project plans should be provided for our review prior to construction. Additional analyses could be warranted based on

the proposed improvements and their locations to the adjacent slopes and chosen construction methods.

11 CONCLUSIONS

Based on the results of our evaluation, it is our opinion that the proposed project and associated improvements for the San Rafael Treatment Wetland are feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the design and construction of the project. In general, the following conclusions were made:

- The subject site is generally underlain by undocumented fill over young alluvial deposits consisting of moist to wet, loose to very dense, poorly graded gravel, well-graded sand with silt, poorly graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and possible boulders. The young alluvial deposits are underlain by Topanga Formation bedrock consisting of weakly to moderately cemented sandstone. The fill materials are considered to be potentially compressible.

- In general, excavations in the existing fill soil, young alluvium, and Topanga Formation bedrock should be feasible with earthmoving equipment in good working condition.

- We anticipate that the on-site excavated materials should be suitable for re-use as engineered fill and trench backfill provided, they are free of trash, debris, roots, contamination, deleterious materials, and cobbles or hard lumps of material in excess of 4 inches in diameter. Oversize materials will be encountered during site excavations and should be anticipated by the contactor. Processing of the materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should also be planned by the contractor.

- The on-site soils are generally granular and will be prone to caving during excavation. The on-site soils should be considered as Type C soils in accordance with United States Department of Labor Occupational Safety and Health Administration (OSHA) regulations. Accordingly, temporary excavations deeper than 4 feet in depth should be shored or laid back at inclinations of 1½ to 1 (horizontal to vertical) or flatter.

- Where excavations cannot be laid back, temporary shoring is anticipated. Shoring should be designed by the contractor to support the excavation sidewalls and to reduce the potential for settlement of adjacent structures, roadways and other site improvements. Shoring should be designed in accordance with OSHA regulations.

- Our percolation testing indicates that the alluvial deposits at the approximate invert depth of the infiltration facility have an adjusted infiltration rate 2.9 inches per hour. We recommend using this value for design of the project; however, this rate should be adjusted as needed in accordance with the 2021 LACDPW guidelines.

- Groundwater was measured in our exploratory boring B-3 at depth of approximately 13.6 feet after completion of drilling. Fluctuations in the level of groundwater will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors that were not evident at the time of our field evaluation.

- The site is located within a mapped Seismic Hazards Zone considered susceptible to liquefaction (CGS, 2017 and 2022a,b). However, due to the shallow depth to bedrock as well as the dense nature of alluvium soil liquefaction is not a design consideration for this project.

- The adjacent steep slopes north and west of the site are located within a mapped Seismic Hazards Zone as being susceptible to seismically induced landslides (CGS, 2017 and 2022a,b).
- The site is not located within an EFZ with the potential for fault rupture as defined by the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 2018). The probability of surface fault rupture at the site is considered to below.
- Based on the results of our laboratory testing (relatively dense and moist materials), hydro-collapse of the on-site alluvial soils resulting from on-site infiltration is not considered a design issue.
- The site is not located within a designated flood inundation zone from the 100-year flood event (FEMA, 2008).
- Based on our laboratory corrosion testing, the on-site soil can be classified as non-corrosive per the 2021 Caltrans Corrosion Guidelines.

12 RECOMMENDATIONS

The following sections present our geotechnical recommendations for design and construction of the project. This project is in preliminary design phase and some aspects of the design will be subject to change. Ninyo & Moore should review the final plans and develop additional geotechnical recommendations as appropriate. These recommendations are based on our evaluation of the site geotechnical conditions, our understanding of the planned construction, and experience in the vicinity of the project. The work should be performed in conformance with the recommendations presented in this report, project specifications, and appropriate agency standards.

12.1 Earthwork

We anticipate that earthwork at the site will consist of cuts and fills associated with construction of the treatment wetland, installation of associated structures (i.e., new drop structure, actuated valve, hydrodynamic separators, and new foundations for the San Rafael pedestrian bridge), preparation of subgrades for at-grade improvements, and trenching and backfilling of underground utilities and pipelines. Based on our understanding of the project, we anticipate that excavations for the project will vary from approximately 2 to 15 feet in depth. Earthwork operations should be performed in accordance with the requirements of applicable governing agencies and the recommendations presented in the following sections.

12.1.1 Pre-Construction Conference

We recommend that grading and foundation plans be submitted to Ninyo & Moore for review to check for conformance to the recommendations provided in this report. We further recommend that a pre-construction conference be held to discuss the grading

recommendations presented in this report. The owner and/or their representative, the governing agencies' representatives, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the work plan, project schedule, and earthwork requirements.

12.1.2 Clearing and Site Preparation

Prior to performing excavations or other earthwork, the site should be cleared of existing site improvements and foundations, gravel, debris, vegetation, and loose or otherwise unsuitable soils. Materials generated from the clearing/demolition operations should be removed from the project site and disposed of at a legal dump site. Existing utilities to remain in-place should be located and protected from damage by construction activities. Excavations resulting from the removal of foundations, underground utilities, and/or other underground improvements, should be backfilled with compacted fill in general accordance with the fill and compaction recommendations presented below.

12.1.3 Excavation Characteristics

We anticipate that excavations in the undocumented fill, alluvial deposits, and bedrock should be feasible with earthmoving equipment in good working order. Based on the results of our subsurface exploration, we anticipate that the subsurface soils encountered during excavations will generally consist of granular materials of poorly graded gravel, well-graded sand with silt, poorly graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and possible boulders, and bedrock of variably cemented sandstone. Based on our experience, strongly cemented beds and/or concretions may be encountered in the Topanga Formation bedrock that may present difficulty during excavations. During excavations, the contractor should anticipate encountering oversize materials, including cobbles, boulders, and debris in the existing fills. Oversize materials, is not considered suitable for use as backfill should be disposed of off-site. Processing of the excavated materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should be planned by the contractor. Contractors should make their own independent evaluation of the excavatability of the on-site materials prior to submitting their bids, including allowances for processing the soils.

We anticipate that temporary excavations in wet soils will not be stable at inclinations steeper than approximately 3 to 1 (horizontal to vertical). Groundwater and/or seepage should be anticipated from excavations. Temporary excavations should be evaluated in the field at the time of construction by our representative.

12.1.4 Subgrade Preparation for Treatment Wetland

Based on our exploratory borings, granular alluvial deposits are anticipated to be encountered at the bottom of the planned treatment wetland that should be suitable for its intended purpose. The excavation bottoms should be evaluated by our representative during the excavation work. In the event that unsuitable material is encountered along the bottom of the excavation, including debris in the fill material, the unsuitable material should be removed and replaced with loosely packed clean sand or gravel, such as drainage rock. The actual recommendations for removal and replacement should be based on our field observations. We recommend that minimal compaction be performed on the exposed subgrade, and materials used to replace unsuitable materials (if needed). Compaction of the subgrade could potentially reduce the infiltration rate of the wetland. If the subgrade of the wetland is compacted, we recommend that additional percolation testing be performed. It is anticipated that the side slopes for the new treatment wetland will be cut slopes that expose granular existing fill and alluvial soils. The cut side slopes should be constructed at inclinations of approximately 3 to 1 (horizontal to vertical) or flatter. The outer approximately 8 inches of the cut slope surfaces be scarified, moisture-conditioned, and compacted to a relative compaction of 90 percent as evaluate by ASTM International (ASTM) D 1557. If new fills will be placed along the bottom or sides of the wetland, we recommend that the new fill materials be placed on relatively dense alluvial deposits and/or bedrock material. The areas to receive new fill should be observed by our representative during the excavation work. The upper approximately 8 inches of exposed bottom beneath areas to receive fill should be scarified, moisture-conditioned and recompacted to a relative compaction of 90 percent as evaluated by ASTM D 1557.

12.1.5 Treatment of Near-Surface Soils for Pedestrian Bridge and Buried Structures

In order to provide suitable support and reduce the potential for settlement of proposed bridge replacement structure over San Rafael Creek and buried structures (i.e., the drop structure, hydro-dynamic separators, valves, etc.), we recommend that the existing undocumented fill, upper loose alluvial deposits, and/or upper soft/loose bedrock should be removed and recompacted from beneath the footprints of these structures. The excavations should extend deep enough to provide 2 feet or more of newly compacted fill material beneath the proposed foundations. The overexcavation should expose relatively dense alluvial deposits and/or bedrock. Additional overexcavation of loose and/or wet areas may be appropriate. The excavation bottoms should be evaluated by our representative during the excavation work and additional recommendations, if needed, be based on field observations. The limits of removal should extend approximately 2 feet beyond the footprint of the foundations for the

buried structures or a distance equal to the depth of the overexcavations beneath the foundations, whichever is farther. If drainage rock is placed beneath the foundations for the buried structures, the rock can be considered part of the 2-foot-thick layer of compacted fill beneath the foundations. Prior to placing compacted fill and/or drainage rock, the upper approximately 8 inches of the exposed bottom should be scarified, moisture-conditioned to near optimum moisture content, and recompacted to a relative compaction of 90 percent as evaluated by ASTM D 1557.

12.1.6 Temporary Excavations

We recommend that excavations be designed and constructed in accordance with OSHA regulations. These regulations provide shoring design parameters for excavations and trenches up to 20 feet deep based on the soil types encountered. Trenches over 20 feet deep should be designed by the contractor's engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that the undocumented fill and alluvial soils be considered as OSHA Type C soil and the bedrock be considered as OSHA Type B soil.

For trench or other excavations, OSHA requirements regarding personnel safety should be met by using appropriate shoring or by laying back the slopes no steeper than 1½:1 (horizontal to vertical) for Type C soils and 1:1 (horizontal to vertical) for Type B soils. Temporary excavations that encounter seepage may need shoring or may be mitigated by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. On-site safety of personnel is the responsibility of the contractor.

Care should be taken by the contractor to avoid undermining adjacent existing foundations and improvements. New excavations should not extend within the "zone of influence" of existing foundations, if present, which is defined as a 1:1 (horizontal to vertical) plane projecting out from the bottom outside edge of the foundations. In the event that excavations will extend within the "zone of influence" of existing foundations, our office should be notified, and appropriate recommendations provided, such as temporary underpinning of impacted foundations and/or temporary shoring.

12.1.7 Shoring

Where temporary slopes are not possible, shoring will be appropriate. The design of the shoring system should consider the excavation characteristics of the onsite soil, temporary excavation stability, and the impact of construction on existing structures.

Shoring systems will be constructed through fill, alluvial deposits, and bedrock. We anticipate that braced driven sheet pile shoring systems will be appropriate for the project to depths up to approximately 30 feet. Cantilevered shoring systems (if used) should be limited to heights of up to 10 feet. Braced and cantilevered shoring systems should be designed using the lateral earth pressure values presented on Figures 7 and 8, respectively. The recommended design pressures are based on the assumptions that the shoring system is constructed without raising the ground surface elevation behind the shoring wall, that there are no surcharge loads, such as soil stockpiles and construction materials, and that no loads act above a 1:1 (horizontal to vertical) plane extending up and back from the base of the shoring system. For shoring walls subjected to the above-mentioned surcharge loads, the contractor should include the effect of these loads on the lateral pressures against the shoring system. The shoring systems planned for the project should be reviewed by our office to evaluate the design considerations and geotechnical parameters used. Ground settlement may occur behind the shoring system wall during excavation. The amount of settlement depends on the type of shoring system, the contractor's workmanship, and soil conditions. We recommend that structures/improvements in the vicinity of the planned shoring installation be reviewed with regard to foundation support and tolerance to settlement. To reduce the potential for distress to adjacent structures, we recommend that the shoring system be designed to limit the ground settlement behind the shoring system to ½ inch or less, which would equal approximately ½ inch of deflection. Potential causes of settlement that should be addressed include settlement during installation of the shoring, excavation for structure construction, construction vibrations, and removal of the support system. The vibrations from the driving of sheet piles, if used, may result in some dynamic settlement of granular soils that may affect the adjacent structures. We recommend that shoring installation be evaluated carefully by the contractor prior to construction and that ground vibration and settlement monitoring be performed during construction. Vibration and settlement monitoring should be performed during sheet pile driving, if used. If settlement is detected or peak particle velocities of approximately 0.4 inch per second or more are measured adjacent to existing improvements, the sheet pile driving should be stopped and evaluated. The evaluation may include changing the hammer vibration frequency and monitoring for settlement and vibrations. To reduce the potential for settlement associated with sheet pile removal, sheet piles may be left in place. In the event excessive settlement or other damage occurs associated with the pile driving operations, it may be appropriate to perform grouting beneath nearby structure(s) to mitigate the pile driving effects. We recommend that shoring installation be evaluated carefully by the contractor prior to construction.

The contractor should retain a licensed, qualified and experienced engineer to design the shoring system. The shoring parameters presented in this report are minimum requirements, and the contractor should evaluate the adequacy of these parameters and make the modifications as needed for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed.

12.1.8 Construction Dewatering

Groundwater was measured at a depth of approximately 13½ feet in boring B-3 during our field exploration. Excavations in the alluvial soils that extend below this depth should anticipate saturated soil conditions and possible dewatering. As indicated, the depth to groundwater may vary depending on many site factors, including variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, and groundwater pumping, and during or shortly after storm events given the proximity of the site to San Rafael Creek and Arroyo Seco. The dewatering system design should be performed by a specialty dewatering contractor. Disposal of groundwater should be performed in accordance with guidelines of the Regional Water Quality Control Board.

12.1.9 Fill Material

In general, the on-site soils should be suitable for reuse as fill materials, provided they are free of trash, debris, oversize material, or other deleterious materials. Fill should generally be free of rocks or lumps of material in excess of 4 inches in diameter. Rocks or hard lumps larger than approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site.

Fill used as backfill of buried structures should consist of free-draining, granular, non-expansive soil that conforms with the latest edition of Greenbook for structure backfill. “Non-expansive” can be defined as soil having an EI of 20 or less in accordance with ASTM Test Method D 4829 (CBC, 2019). The on-site granular soils are anticipated to meet this requirement.

Imported fill material should consist of clean, non-expansive, granular material which also conforms to the latest addition of Greenbook for structure backfill. The soil should also be tested for corrosive properties prior to importing. We recommend that the imported materials meet the 2021 Caltrans criteria for non-corrosive soils (i.e., soils having a chloride concentration of 500 parts per million [ppm] or less, a soluble sulfate content of approximately 0.15 percent (1,500 ppm) or less, a pH value of 5.5 or higher, or an electrical resistivity of

1,500 ohm-centimeters or more). Materials for use as fill should be evaluated by Ninyo & Moore prior to importing. The contractor should be responsible for the uniformity of import material brought to the site.

12.1.10 Fill Placement and Compaction

In general, fill material, including structure and trench backfill and fill placed beneath foundations, should be moisture-conditioned and compacted in horizontal lifts to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Fill material with less than 15 percent fines (passing No. 200 sieve) should be compacted to 95 percent relative compaction as evaluated by ASTM D 1557. Fill material should be moisture-conditioned to slightly above the laboratory optimum moisture content. The lift thickness for fill soils will depend on the type of compaction equipment used but generally should not exceed 8 inches in loose thickness. Special care should be exercised to avoid damaging pipes during compaction of trench backfill. Placement and compaction of the fill soils should be in general accordance with local grading ordinances and good construction practice.

12.2 Underground Utilities

We anticipate that underground pipelines will be supported on native alluvial deposits. Based on the conceptual plans (Craftwater, 2020), pipeline inverts are anticipated to be on the order of 5 to 10 feet in depth.

12.2.1 Pipe Bedding

We recommend that pipes be supported on 6 inches or more of granular bedding material, such as sand, with a sand equivalent value of 30 or more. Bedding material should be placed around the pipe and 12 inches or more above the top of the pipe in accordance with the current Greenbook. Special care should be taken not to allow voids beneath the pipe. Compaction of the bedding material and backfill should proceed up both sides of the pipe. Trench backfill, including bedding material, should be placed in accordance with the recommendations presented in the Earthwork section of this report.

12.2.2 Trench Backfill

Based on our subsurface evaluation, the on-site soils should generally be suitable for re-use as trench backfill provided, they are free of organic material, clay lumps, debris, and rocks more than approximately 4 inches in diameter. We recommend that trench backfilling be in general conformance with the Greenbook standard specifications for structure backfill. Fill should be moisture-conditioned to at or slightly above the laboratory optimum. Wet soils

should be allowed to dry to a moisture content near the optimum prior to their placement as trench backfill. Trench backfill should be compacted to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Lift thickness for trench backfill will depend on the type of compaction equipment utilized but should generally be placed in horizontal lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipelines during compaction of the backfill.

12.2.3 Modulus of Soil Reaction for Pipe Design

The modulus of soil reaction is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines for the purpose of evaluating deflection caused by the weight of the backfill above the pipe. We recommend that a modulus of soil reaction of 1,000 pounds per square inch be used for design, provided that granular bedding material is placed adjacent to the pipe, as recommended in the previous section.

12.3 Site-Specific Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the site-specific spectral response acceleration parameters in accordance with the CBC (2019) guidelines.

Table 2 – 2019 California Building Code Seismic Design Criteria

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	C
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	2.107
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.748
Site-modified Spectral Response Acceleration at 0.2-second Period, S_{MS}	2.529
Site-modified Spectral Response Acceleration at 1.0-second Period, S_{M1}	1.047
Site Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.686
Site Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.698
Site- modified Peak Ground Acceleration, PGA_M	1.099

12.4 Foundations

Our evaluation indicated that proposed buried structures (i.e., drop structure, hydrodynamic separators, and valves, etc.) may be supported by mat foundations. Information regarding the bridge reconstruction, such as type of existing foundations, whether the existing foundations will be reused, etc. were unknown by our firm when preparing this report. For preliminary planning purposes, we are assuming that the new bridge will be supported on new spread footing foundations. The new mat and spread footing foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures:

12.4.1 Spread Footings

Spread footings for the bridge structure should be placed directly on compacted fill in accordance with the recommendations presented in the Earthwork section of this report. The spread footings should extend 24 inches or more below the lowest adjacent finished grade. Continuous and isolated footings should have a width of 24 inches or more. Continuous footings should be reinforced with two No. 4 steel reinforcing bars, one placed near the top and one placed near the bottom of the footings, and further detailed in accordance with the recommendations of the structural engineer.

Footings, as described above and bearing on compacted fill, may be designed using a net allowable bearing capacity of 3,000 pounds per square foot (psf). Total and differential settlements for footings designed in accordance with the above recommendations are estimated to be less than approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively.

Footings bearing on compacted fill may be designed using a coefficient of friction of 0.4, where the total frictional resistance equals the coefficient of friction times the dead load. Footings may be designed using a passive resistance value of 300 psf per foot of depth, with a maximum value of 4,500 psf. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance (including the maximum value) may be increased by one-third when considering loads of short duration such as wind or seismic forces.

12.4.2 Mat Foundations

Mat foundations may be supported on compacted fill in accordance with the recommendations presented in the Earthwork section of this report. Foundations should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

The mat foundations may be designed using a net allowable bearing capacity of 4,000 psf. The total and differential settlement corresponding to this allowable bearing load are estimated to be less than approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively.

Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils directly underlying the mat. A design modulus of subgrade reaction (K) of 50 tons per cubic foot may be used for the subgrade soils in evaluating such deflections.

12.5 Lateral Earth Pressures for Underground Structures

Walls for below-grade structures when constructed as recommended above may be designed for lateral pressures represented by the pressure diagram on Figure 9. To reduce the potential for pipe-to-wall differential settlement, which could cause pipe shearing, we recommend that a flexible pipe joint be located close to the exterior of the wall. The type of joint should be such that minor relative movement can be accommodated without distress. The pipe connections should be sufficiently flexible to withstand differential settlement of approximately ¾ inch.

12.6 Corrosivity

Laboratory testing was performed on a representative shallow soil sample collected from boring B-1 to evaluate soil pH, electrical resistivity, water-soluble chloride content, and water-soluble sulfate content. The soil pH and electrical resistivity tests were performed in general accordance with California Test Method (CT) 643. Chloride content tests were performed in general accordance with CT 422. Sulfate testing was performed in general accordance with CT 417. The soil pH of the sample tested was measured to be 7.4 and the electrical resistivity was measured to be 7,260 ohm-centimeters. The chloride content of the sample was measured to be 10 ppm. The sulfate content of the sample was measured to be 0.001 percent by weight (i.e., 10 ppm). Based on the laboratory test results and 2021 Caltrans corrosion criteria, the soils at the project site can be classified as non-corrosive, which is defined as having earth materials with less than 500 ppm chlorides, less than 0.15 percent sulfates (i.e., 1,500 ppm), a pH of 5.5 or more, or an electrical resistivity of 1,500 ohm-cm or more. The corrosivity test results are presented in Appendix B.

12.7 Concrete Placement

Concrete in contact with soil or water that contains high concentrations of water-soluble sulfates can be subject to premature chemical and/or physical deterioration. Based on the CBC (2019), the potential for sulfate attack is negligible for water-soluble sulfate contents in soil ranging from 0.00 to 0.10 percent by weight, moderate for water-soluble sulfate contents ranging from 0.10 to 0.20 percent by weight, severe for water-soluble sulfate contents ranging from 0.20 to 2.00 percent by weight, and very severe for water-soluble sulfate contents over 2.00 percent by weight. The soil samples tested for this evaluation, using CT 417, indicate water-soluble sulfate contents of approximately 0.001 and 0.002 percent by weight (i.e., 10 and 20 ppm). Accordingly, the on-site soils are considered to have a negligible potential for sulfate attack. Per ACI (2019b),

Type II cement is appropriate for the site improvements. However, due to the potential variability of the soils on site, consideration should be given to using Type II/V cement for the project.

To reduce the potential for shrinkage cracks in the concrete during curing, we recommend that the concrete for the proposed improvements be placed with a slump of 4 inches based on ASTM C 143. The slump should be checked periodically at the site prior to concrete placement. We further recommend that concrete cover over reinforcing steel for foundations be provided in accordance with CBC (2019). The structural engineer should be consulted for additional concrete specifications.

12.8 Stormwater Infiltration Gallery

Based on our subsurface evaluation, the site is generally underlain by undocumented fill and alluvial deposits consisting of poorly graded gravel, well-graded sand with silt, poorly graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and possible boulders. We recommend that an infiltration rate of 2.9 inches per hour, following adjustments by the BMP designer for RF_s, be used for the site alluvial soils. As previously discussed, we anticipate that stormwater will mound/perch on top of the bedrock encountered at depths of approximately 14 to 19 feet across the majority of the site. It is anticipated that infiltrated stormwater will move laterally along this contact. We recommend that the bottoms of the wetland be further evaluated during construction. Additional recommendations may be provided at that time if fine-grained materials are present within the alluvial deposits exposed at the bottom of the wetland, such as removing the fine-grained material and replacing it with granular material.

Based on our evaluation, the potential for hydro-collapse settlement associated with infiltration is generally low due to the proposed depth of infiltration. However, we generally recommend a setback of 15 feet or more between settlement sensitive structures and proposed infiltration areas.

12.9 Drainage

Proper surface drainage is imperative for satisfactory site performance. Positive drainage should be provided and maintained to direct surface water away from existing foundations. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet or more away from foundations and tops of slopes. Runoff should then be directed by the use of swales or pipes into a collective drainage system. Area drains for landscaped and paved areas are recommended. Surface waters should not be allowed to pond adjacent to footings. We recommend that above-ground structures, if constructed, have roof drains and downspouts installed to collect runoff.

12.10 Landscaping

Project landscaping should consist of drought tolerant plants. Landscape irrigation should be kept to a level just sufficient to maintain plant vigor. Overwatering should not be permitted.

13 CONSTRUCTION OBSERVATION

The recommendations provided in this report are based on our understanding of the proposed project and our evaluation of the data collected based on subsurface conditions disclosed by widely spaced exploratory borings. It is imperative that the geotechnical consultant checks the interpolated subsurface conditions during construction. We recommend that Ninyo & Moore review the project plans and specifications prior to construction. It should be noted that, upon review of these documents, some recommendations presented in this report may be revised or modified.

During construction we recommend that the duties of the geotechnical consultant include, but not be limited to:

- Observing site clearing, grubbing, and removals.
- Observing excavation bottoms, including the bottom of the proposed wetland.
- Observing preparation of pavement and foundation subgrades.
- Observing placement and compaction of fill, including trench and structure backfill.
- Evaluating imported materials prior to their use as fill (if used).
- Performing field tests to evaluate fill compaction.
- Observing foundation excavations for bearing materials and cleaning prior to placement of reinforcing steel or concrete.
- Performing material testing services including concrete compressive strength and steel tensile strength tests and inspections.

The recommendations provided in this report assume that Ninyo & Moore will be retained as the geotechnical consultant during the construction phase of this project. If another geotechnical consultant is selected, we request that the selected consultant indicate to the owner and to our firm in writing that our recommendations are understood and that they are in full agreement with our recommendations.

14 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analysis presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty,

expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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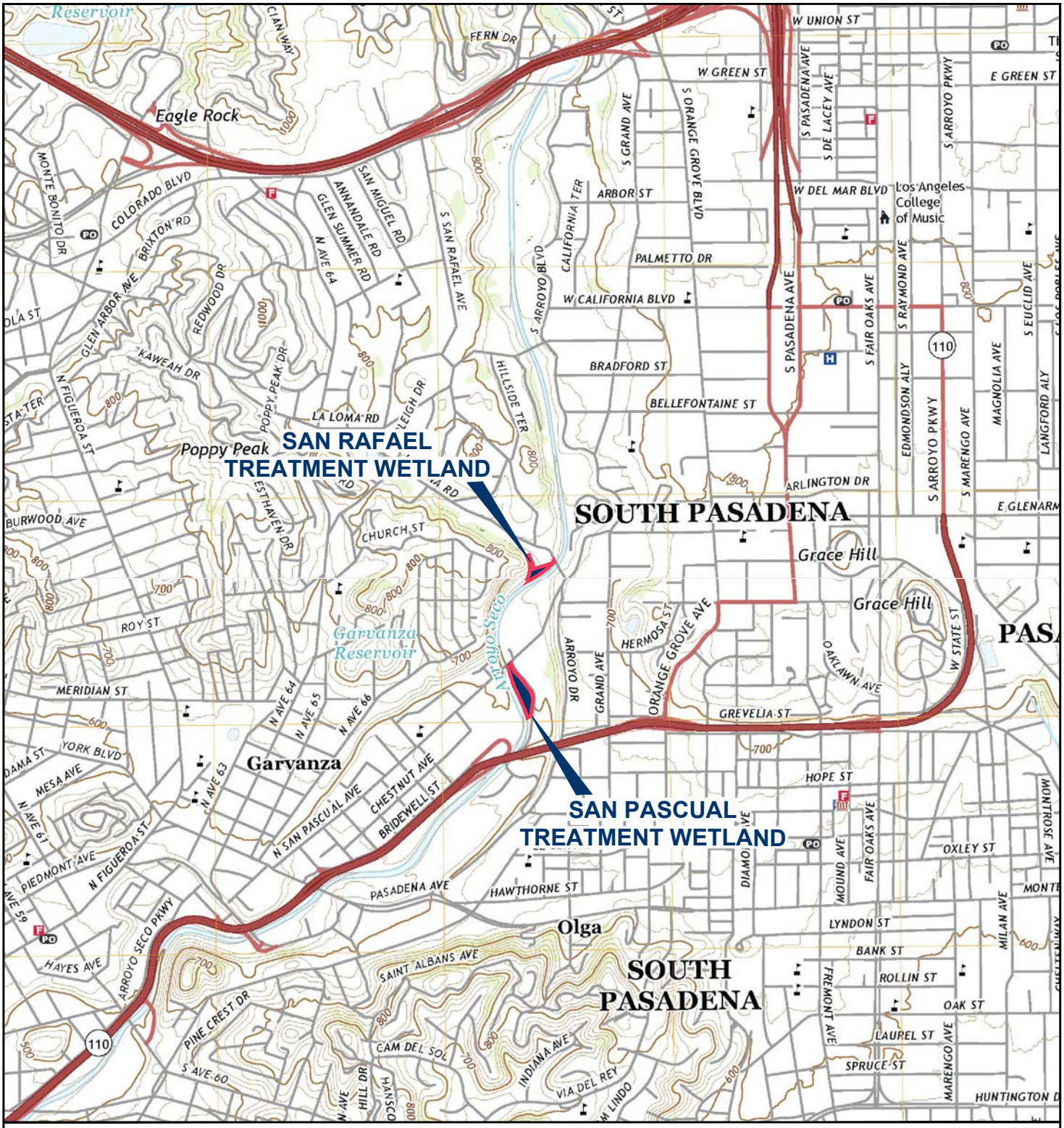
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FIGURES



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: USGS, 2022.

N

FEET
0 2,000 4,000

1_211880001_SL.dwg (San Rafael) 06/08/2022 JDP, GK

FIGURE 1

SITE LOCATION

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

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LEGEND

B-3 TD=30.2 — BORING; TD=TOTAL DEPTH IN FEET

P-2 TD=10.1 — PERCOLATION TEST; TD=TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: GOOGLE EARTH, 2022.

N

FEET

0 120 240

FIGURE 2

SITE AERIAL PHOTOGRAPH

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

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2_211880001_SAP.dwg (San Rafael) 06/17/2022 JDP, GK



LEGEND

B-3 TD=30.2 — BORING; TD=TOTAL DEPTH IN FEET

P-2 TD=10.1 — PERCOLATION TEST; TD=TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: GOOGLE EARTH, 2022; CRAFTWATER ENGINEERING, INC., 2020.

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FIGURE 3

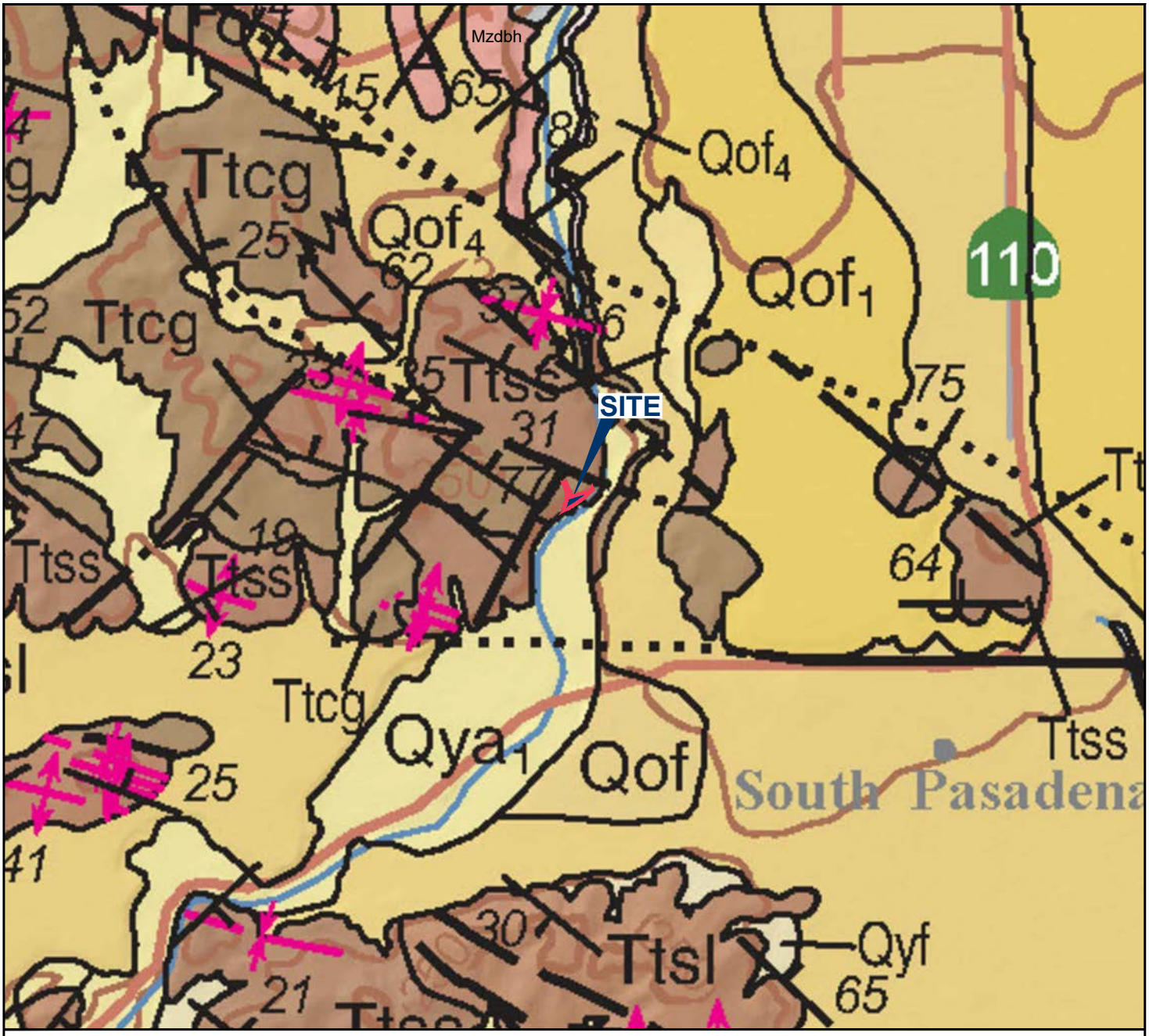
SITE PLAN

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

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LEGEND

Qya	YOUNG ALLUVIUM	Ttcg	TOPANGA GROUP - CONGLOMERATE
Qyf	YOUNG ALLUVIAL FAN DEPOSITS	Mzdbh	BIOTITE - HORNBLENDE DIORITE
Qof	OLD ALLUVIAL FAN DEPOSITS		GEOLOGIC CONTACT
Ttss	TOPANGA GROUP - SANDSTONE		FAULT; DASHED WHERE INFERRED; DOTTED WHERE CONCEALED
Ttsl	TOPANGA GROUP - SILTSTONE		SYNCLINE; DASHED WHERE INFERRED
			ANTICLINE; DASHED WHERE INFERRED

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CAMPBELL, R.H., ET AL., 2014.

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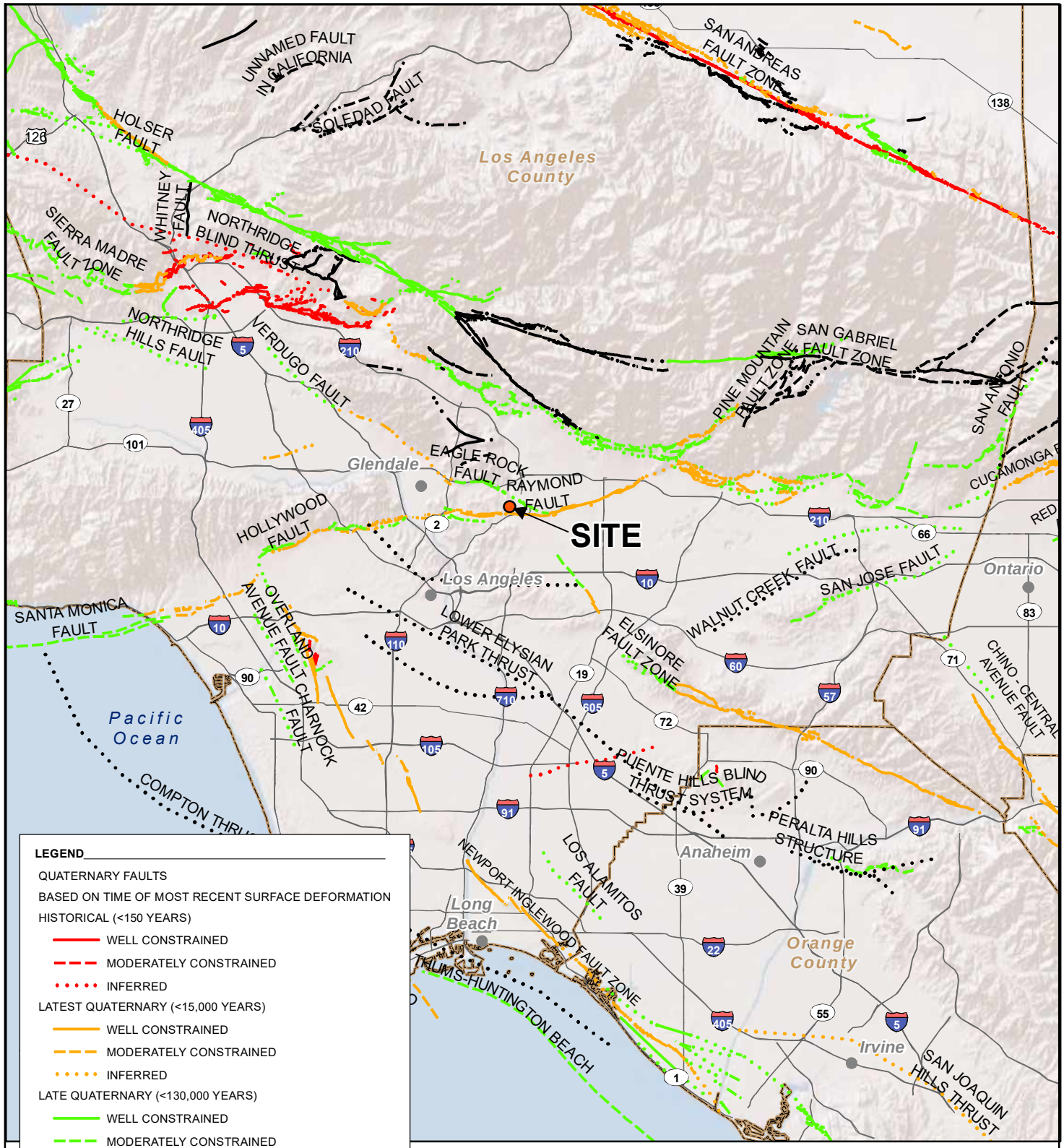
FIGURE 4

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REGIONAL GEOLOGY

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

211880001 I 6/22



211880001-San Rafael_FL.mxd 5/31/2022 JDP

SOURCES: CALIFORNIA GEOLOGICAL SURVEY, ACCESSED MAY 31, 2022, AT: https://www.usgs.gov/natural-hazards/earthquake-hazards/faults; ESRI, 2021.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

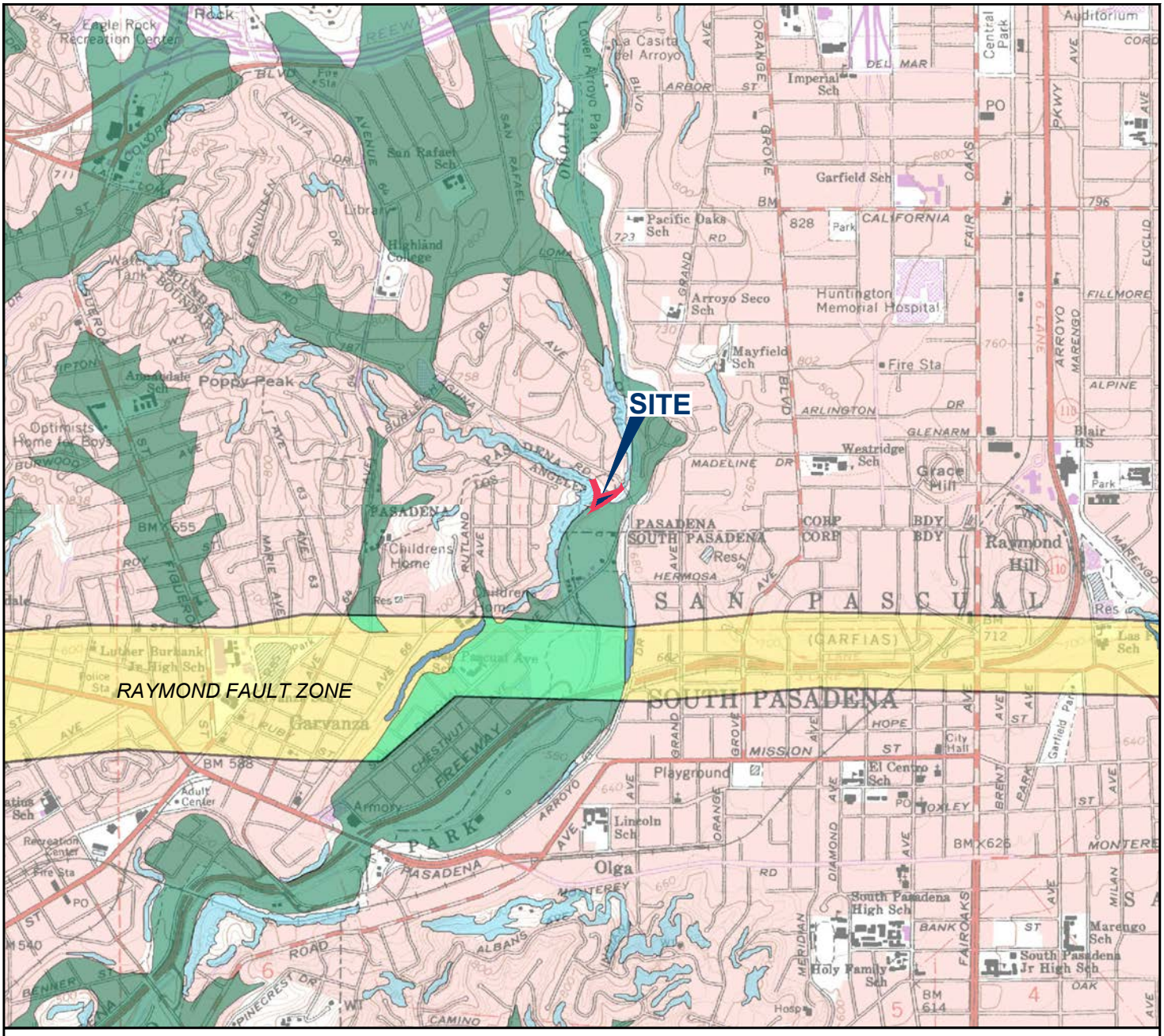
FIGURE 5

FAULT LOCATIONS

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

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LEGEND

EARTHQUAKE-INDUCED LANDSLIDES
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

LIQUEFACTION
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

EARTHQUAKE FAULT ZONES
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Induced Landslide Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

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NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CGS, 1999, REVISED 2017.

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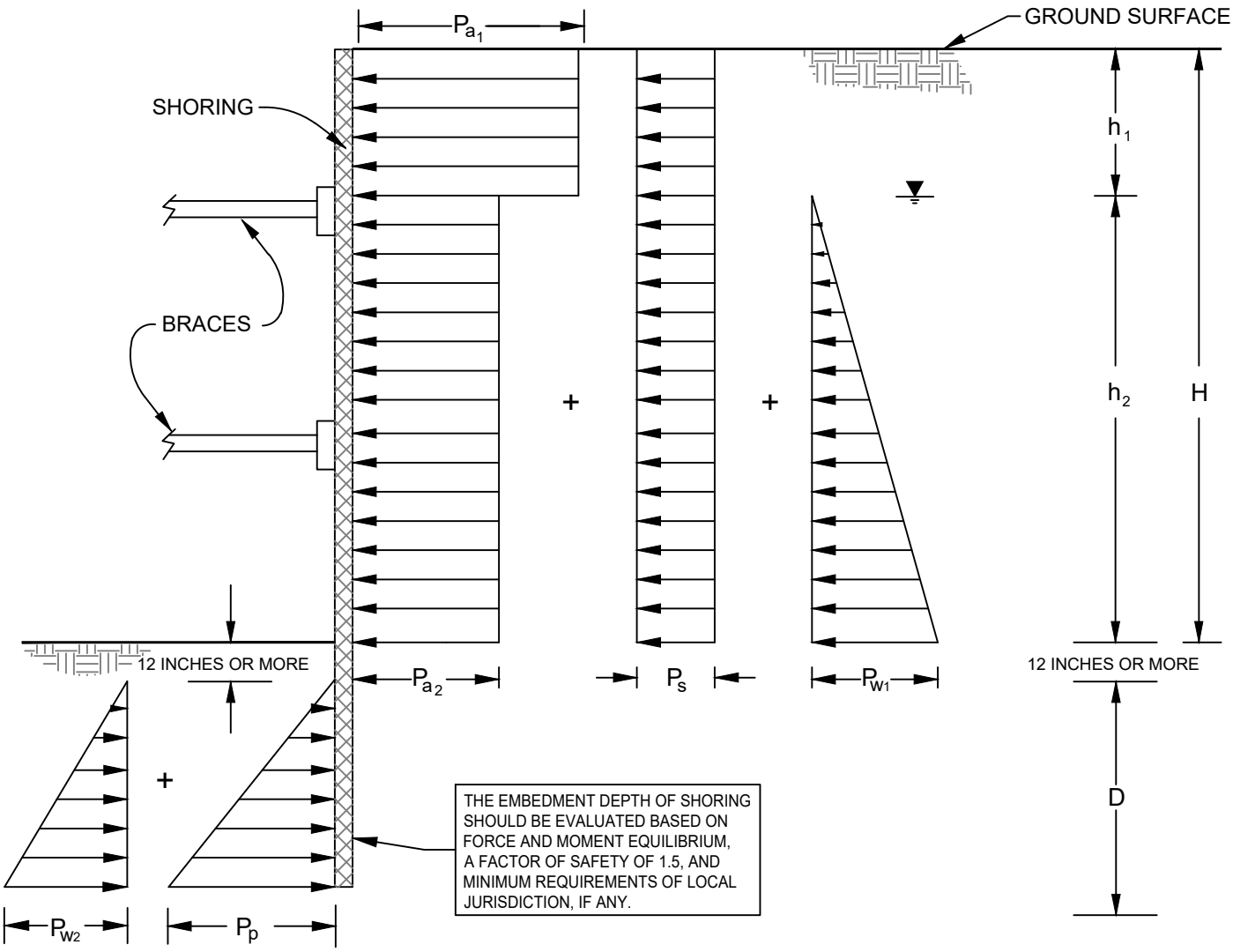
FIGURE 6

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SEISMIC HAZARD ZONES

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

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NOTES:

1. APPARENT LATERAL EARTH PRESSURES, P_{a1} AND P_{a2}
   $P_{a_1} = 25h_1$ psf
   $P_{a_2} = 12h_2$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   $P_s = 120$ psf
3. HYDROSTATIC PRESSURE, P_{w1} & P_{w2}
   $P_{w1} = 62.4(H - h)$ psf
   $P_{w2} = 62.4D$ psf
4. PASSIVE PRESSURE, P_p
   $P_p = 200D$ psf
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H, h_1, h_2 AND D ARE IN FEET
7. ▽ GROUNDWATER TABLE
8. P_{w2} IS APPLICABLE WHEN DEWATERING IS TO BE PERFORMED FROM INSIDE OR OUTSIDE OF THE EXCAVATION

NOT TO SCALE

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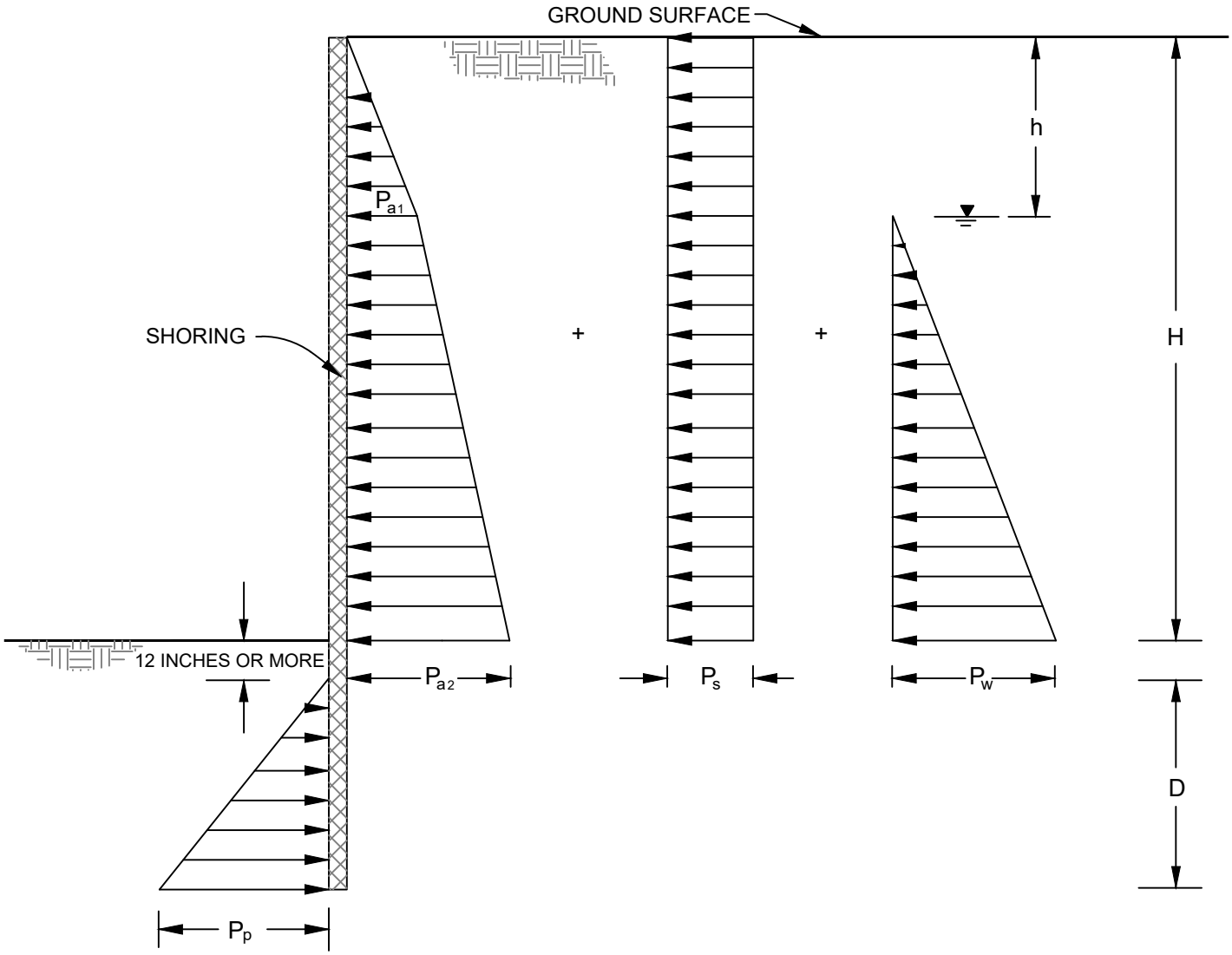
FIGURE 7

LATERAL EARTH PRESSURES FOR BRACED EXCAVATION

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

Ninyo & Moore
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NOTES:

1. ACTIVE LATERAL EARTH PRESSURE, P_a
   P_{a1} = 37h psf; $P_{a2} = P_{a1} + 18(H - h)$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   P_s = 72 psf
3. HYDROSTATIC PRESSURE, P_w
   P_w =62.4(H - h) psf
4. PASSIVE LATERAL EARTH PRESSURE, P_p
   P_p = 200D psf
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H, h AND D ARE IN FEET
7. ⏚ GROUNDWATER TABLE

NOT TO SCALE

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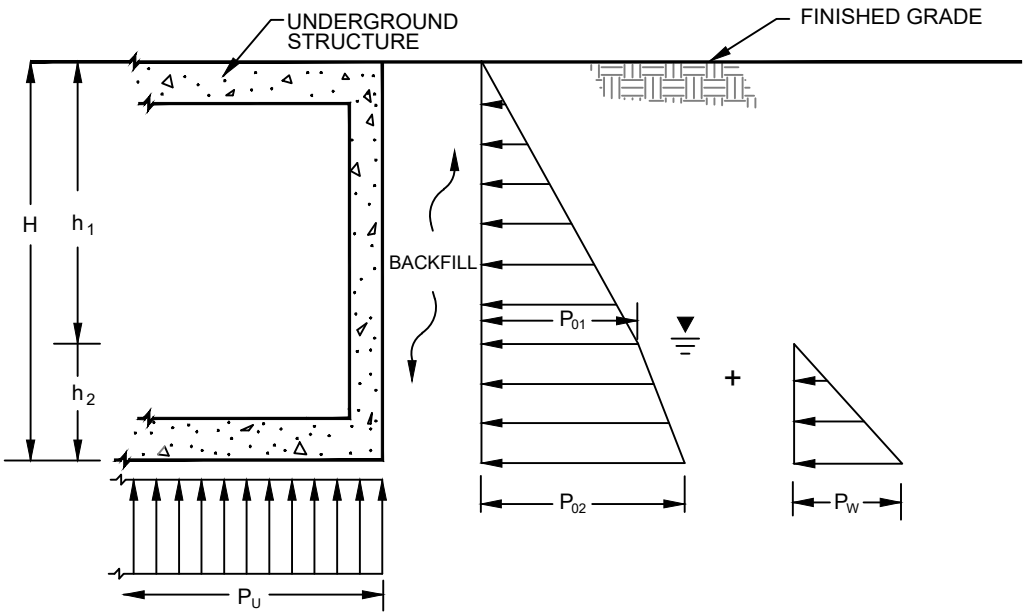
FIGURE 8

LATERAL EARTH PRESSURES FOR TEMPORARY CANTILEVERED SHORING

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

211880001 I 6/22



NOTES:

1. APPARENT LATERAL EARTH PRESSURES, P_{01} AND P_{02}
   $P_{01} = 57h_1$ psf
   $P_{02} = 57h_1 + 28h_2$ psf
2. HYDROSTATIC PRESSURE, P_w
   $P_w = 62.4h_2$ psf
3. UPLIFT PRESSURE, P_u
   $P_u = 62.4h_2$ psf
4. SURCHARGE PRESSURES CAUSED BY VEHICLES OR NEARBY STRUCTURES ARE NOT INCLUDED
5. H, h_1 AND h_2 ARE IN FEET
6. ▼ GROUNDWATER TABLE

NOT TO SCALE

FIGURE 9

LATERAL EARTH PRESSURES FOR UNDERGROUND STRUCTURES

SAN RAFAEL TREATMENT WETLAND
PASADENA, CALIFORNIA

211880001 I 6/22

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APPENDIX A

Boring Logs

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following method.

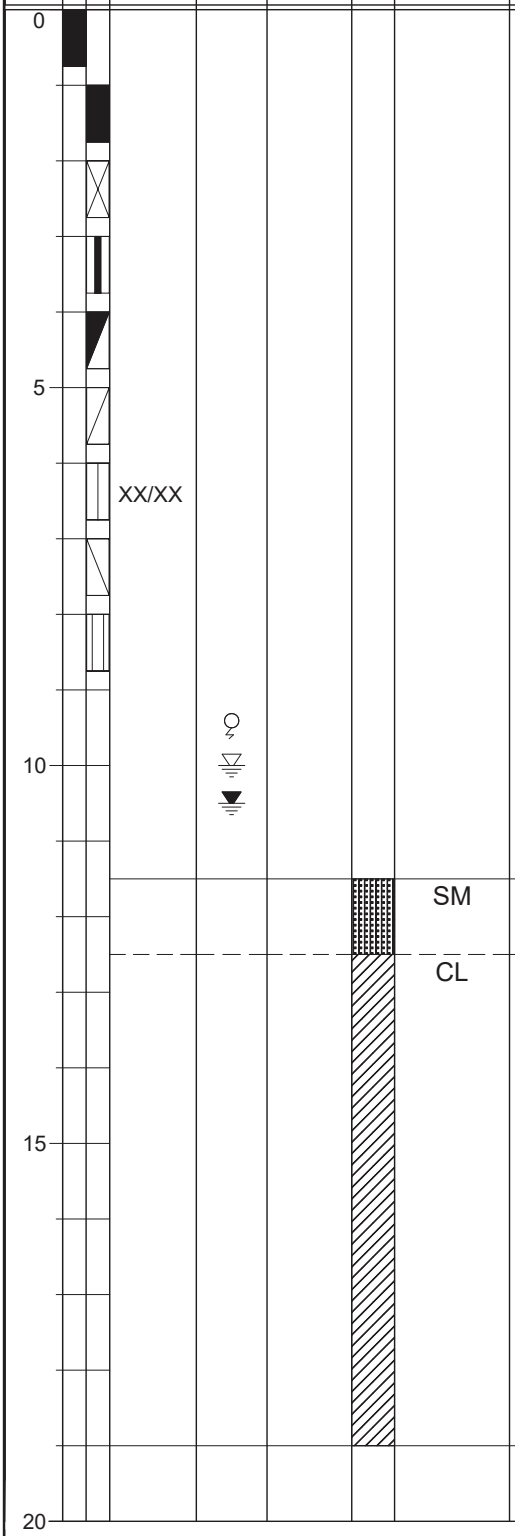
Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of $1^3/_8$ inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer falling freely from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3 inches, was lined with 1-inch-long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

BORING LOG EXPLANATION SHEET



Bulk sample.

Modified split-barrel drive sampler.

No recovery with modified split-barrel drive sampler.

Sample retained by others.

Standard Penetration Test (SPT).

No recovery with a SPT.

Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.

No recovery with Shelby tube sampler.

Continuous Push Sample.

Seepage.

Groundwater encountered during drilling.

Groundwater measured after drilling.

SM

MAJOR MATERIAL TYPE (SOIL):

Solid line denotes unit change.

CL

Dashed line denotes material change.

Attitudes: Strike/Dip
b: Bedding
c: Contact
j: Joint
f: Fracture
F: Fault
cs: Clay Seam
s: Shear
bss: Basal Slide Surface
sf: Shear Fracture
sz: Shear Zone
sbs: Shear Bedding Surface

The total depth line is a solid line that is drawn at the bottom of the boring.

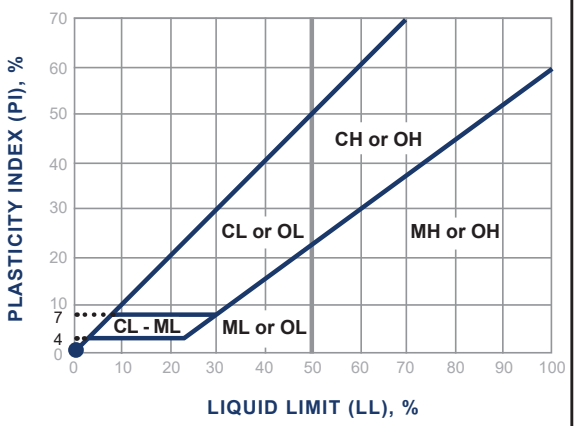
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions	
			Group Symbol	Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 4 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

Consistency - Fine-Grained Soil

Consis-tency	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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USCS METHOD OF SOIL CLASSIFICATION

DATE DRILLED 4/27/22 BORING NO. B-1

GROUND ELEVATION 623' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SP-SM	FILL: Brown, moist, medium dense, poorly graded SAND with silt; trace gravel; cobbles.
						ML	Dark brown, moist, medium dense, sandy SILT with gravel and cobbles; trace pieces of brick and glass.
		14	6.7	102.2		SM	YOUNG ALLUVIUM: Brown, moist, loose, silty SAND; few gravel; roots.
10		46				SW-SM	Grayish brown, moist, very dense, well-graded SAND with silt and gravel.
		50/2"	6.0	121.9			TOPANGA FORMATION: Gray, moist, moderately soft to moderately hard, weakly cemented, silty SANDSTONE; trace gravel.
20		50/2"					
		50/6" 40/2"					
30		50/5"					
							Total Depth = 30.4 Feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 4/27/22. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40							

FIGURE A- 1

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SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/27/22 BORING NO. B-2

GROUND ELEVATION 626' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SP-SM	FILL: Reddish brown, moist, medium dense, poorly graded SAND with silt; trace gravel; cobbles.
						ML	Dark brown, moist, medium dense, sandy SILT; trace gravel; roots.
						SP-SM	Brown, moist, medium dense, poorly graded SAND with silt, gravel and cobbles.
		50/5"	1.8	121.3		SM	YOUNG ALLUVIUM: Grayish brown, moist, very dense, silty SAND; few to little gravel; cobbles.
10						ML	Grayish brown, moist, very dense, sandy SILT; few to little gravel; cobbles.
		50/5"					
		50/4"	4.4	110.7			TOPANGA FORMATION: Gray, moist, moderately soft, weakly to moderately cemented, silty SANDSTONE; trace gravel; cobbles. @ 17': Increase in moisture.
		50/1"					Refusal. Total Depth = 18.6 feet. (Refusal) Groundwater was not encountered during drilling. Backfilled with on-site soil on 4/27/22.
20							Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
30							
40							

FIGURE A- 2

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SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/27/22 BORING NO. B-3

GROUND ELEVATION 623' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Brown, moist, medium dense, silty SAND; trace gravel, glass, and asphalt concrete; cobbles.
		67/11"	1.6	120.3		GP	YOUNG ALLUVIUM: Light brown, moist, very dense, poorly graded GRAVEL with sand; cobbles and/or possible boulders.
10		43				SM	Light brown, moist, very dense, silty SAND; few to little gravel; cobbles.
			▼				@ 13.6': Groundwater measured 25 minutes after drilling; wet.
		50/6"	▽ 8.0	134.3		GP	Light brown, wet, very dense, poorly graded GRAVEL with sand. @ 15': Groundwater encountered during drilling.
20		50/4"					TOPANGA FORMATION: Gray, wet, soft, weakly cemented, silty SANDSTONE.
		50/5"	12.7	120.1			Moderately soft.
30		50/2"					Total Depth = 30.2 feet. Groundwater was encountered during drilling at approximately 15 feet. Groundwater was measured at approximately 13.6 feet 25 minutes after completion of drilling. Backfilled with cement grout on 4/27/22. Notes: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40							

FIGURE A- 3

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SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/27/22 BORING NO. P-1

GROUND ELEVATION 627' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SP-SM	FILL: Reddish brown, moist, medium dense, poorly graded SAND with silt; trace gravel; cobbles.
						ML	Dark brown, moist, medium dense, sandy SILT; trace gravel and brick pieces.
		29				SW-SM	YOUNG ALLUVIUM: Brown, moist, medium dense, well-graded SAND with silt and gravel.
		18					
10		81					Very dense.
							Total Depth = 10.2 feet. Groundwater was not encountered during drilling. In-situ percolation test performed on 4/27/22.
							Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
20							The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
30							
40							

FIGURE A- 4

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SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/27/22 BORING NO. P-2

GROUND ELEVATION 622' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SP-SM	FILL: Reddish brown, moist, medium dense, poorly graded SAND with silt; trace gravel; roots up to 1/2-inch in diameter.
						ML	Dark brown, moist, medium dense, sandy SILT; trace gravel. @ 3': Piece of plastic. @ 4': Pieces of brick.
		22				SP-SM	YOUNG ALLUVIUM: Light brown, moist, dense, poorly graded SAND with silt; trace gravel.
		40	2.0	108.7		SP	Light brown, moist, medium dense, poorly graded SAND with gravel.
10							Total Depth = 10.1 feet. Groundwater was not encountered during drilling. In-situ percolation test performed on 4/27/22. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20							
30							
40							

FIGURE A- 5

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SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix B.

In-Place Moisture and Density Tests
The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix B.

Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-3. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

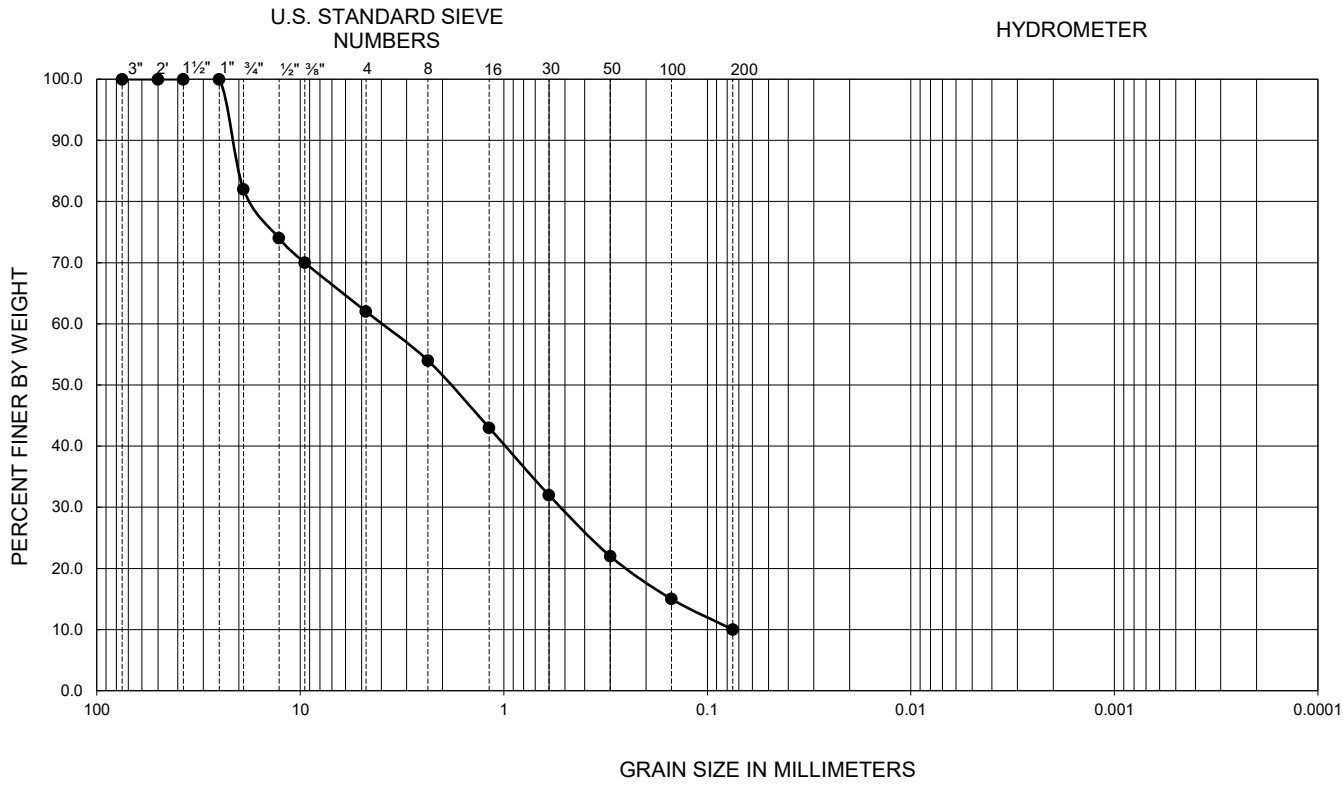
200 Wash
An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the tests are presented on Figure B-4.

Atterberg Limits
A test was performed on a selected representative fine-grained soil sample to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure B-5.

Direct Shear Tests
A direct shear test was performed on relatively undisturbed sample in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The sample was inundated during shearing to represent adverse field conditions. The results are shown on Figure B-6.

Soil Corrosivity Tests
Soil pH and resistivity test was performed on a representative sample in general accordance with CT 643. The soluble sulfate and chloride content of the selected sample was evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-7.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	10.0-11.5	--	--	--	0.08	0.53	3.90	52.0	1.0	10	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-1

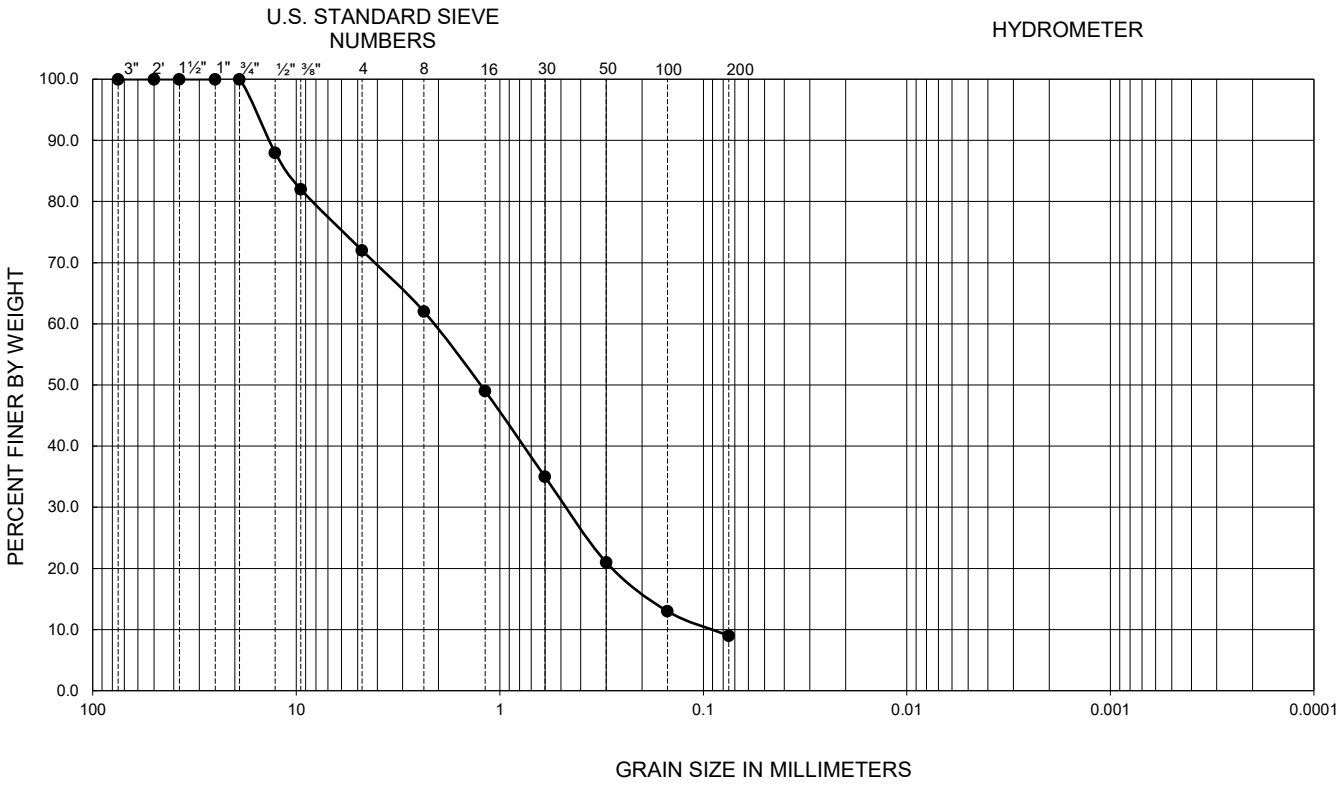
GRADATION TEST RESULTS

SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-1	6.5-8.0	--	--	--	0.09	0.48	2.10	23.3	1.2	9	SW-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-2

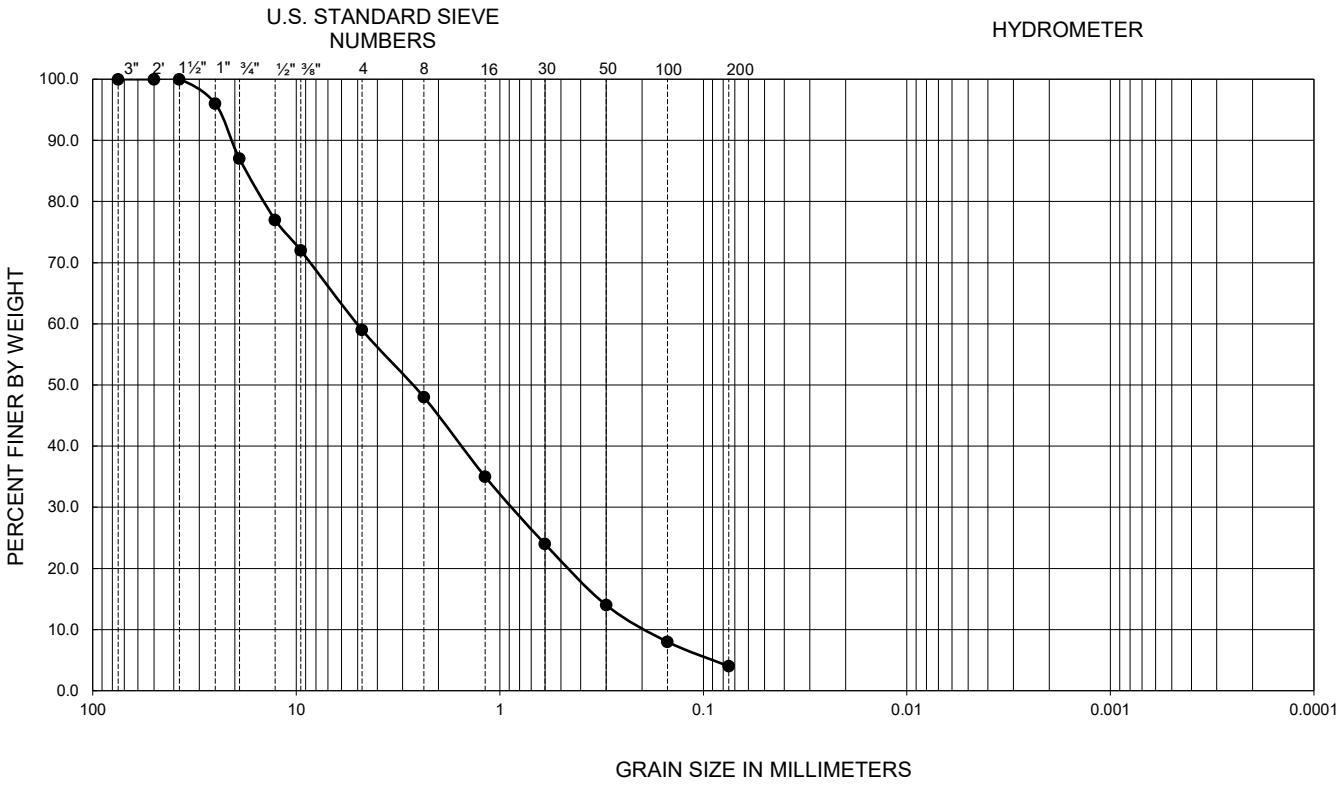
GRADATION TEST RESULTS

SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

211880001 Fig B-2_SIEVE w No 8 @ P-1 6.5-8.0

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-2	8.5-10.0	--	--	--	0.20	0.88	5.00	25.0	0.8	4	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-3

GRADATION TEST RESULTS

SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS OR EQUIVALENT (TOTAL SAMPLE)
B-1	5.0-6.5	SILTY SAND	90	25	SM
B-1	20.0-21.0	SILTY SANDSTONE	96	34	SM
B-3	5.0-6.5	POORLY GRADED GRAVEL WITH SAND	43	2	GP
B-3	15.0-16.0	POORLY GRADED GRAVEL WITH SAND	50	4	GP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

FIGURE B-4

NO. 200 SIEVE ANALYSIS TEST RESULTS

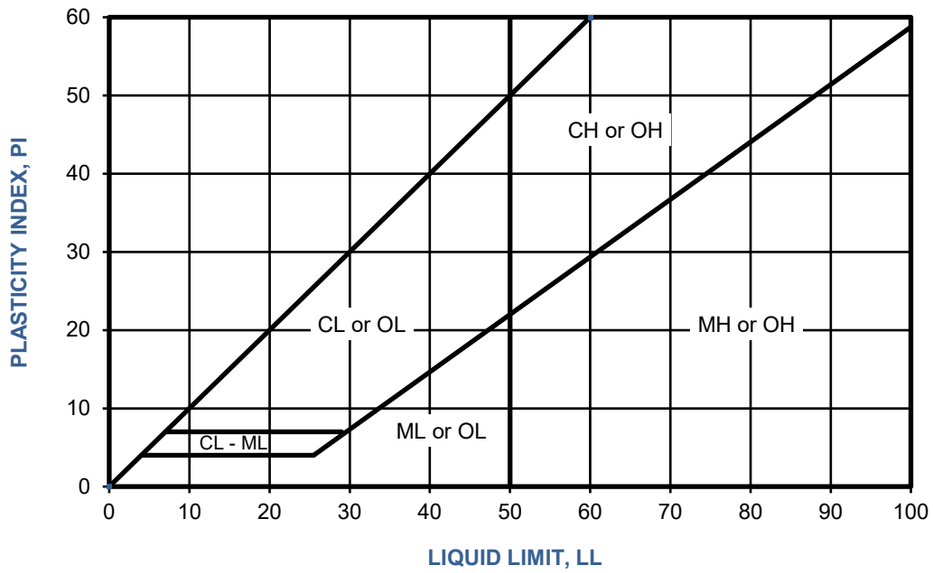
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SOUTH PASADENA, CALIFORNIA

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SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS
●	B-2	10.0 - 11.0	-	-	NP	ML	ML

NP - INDICATES NON-PLASTIC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

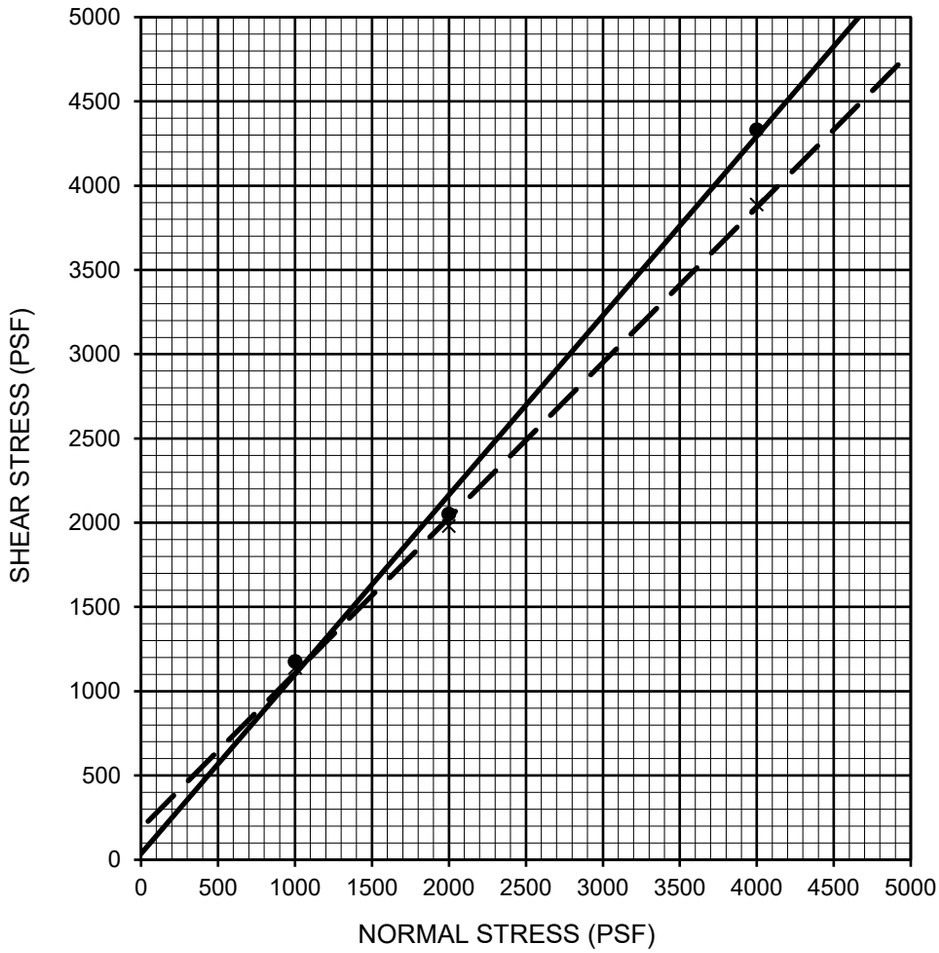
FIGURE B-5

ATTERBERG LIMITS TEST RESULTS

SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type (Equivalent)
SILTY SANDSTONE	—●—	B-1	15.0-16.0	Peak	36	47	SM
SILTY SANDSTONE	– – X – –	B-1	15.0-16.0	Ultimate	186	43	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE B-6

DIRECT SHEAR TEST RESULTS

SAN RAFAEL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-1	3.0-5.0	7.4	7,260	10	0.001	10

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE B-7

CORROSIVITY TEST RESULTS

SAN RAFAEL TREATMENT WESTLAND
SOUTH PASADENA, CALIFORNIA

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

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APPENDIX C

Analytical Test Results
(Drum Characterization)

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

09 May 2022

Aura Scharf
Ninyo & Moore
475 Goddard, Ste. 200
Irvine, CA 92618

RE: Arroyo Seco - San Rafael Water Reuse 2 Natural

Enclosed are the results of analyses for samples received by the laboratory on 04/29/22 16:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joann Marroquin For Taili Iinuma
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Drum #1_B-3	T221276-01	Soil	04/27/22 15:10	04/29/22 16:55
Composite 2:1 Drum#2_B-2A - Drum #1_B-1A	T221276-04	Soil	04/28/22 11:30	04/29/22 16:55

SunStar Laboratories, Inc.

Joann Marroquin

Joann Marroquin For Taili Iinuma, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

DETECTIONS SUMMARY

Sample ID: Drum #1_B-3 **Laboratory ID:** T221276-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**57**	1.0	mg/kg	EPA 6010b	
Chromium	**26**	2.0	mg/kg	EPA 6010b	
Cobalt	**4.1**	2.0	mg/kg	EPA 6010b	
Copper	**5.4**	1.0	mg/kg	EPA 6010b	
Nickel	**2.8**	2.0	mg/kg	EPA 6010b	
Vanadium	**25**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

Sample ID: Composite 2:1 Drum#2_B-2A - Drum **Laboratory ID:** T221276-04

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**45**	1.0	mg/kg	EPA 6010b	
Chromium	**26**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.2**	2.0	mg/kg	EPA 6010b	
Copper	**8.3**	1.0	mg/kg	EPA 6010b	
Nickel	**8.3**	2.0	mg/kg	EPA 6010b	
Vanadium	**45**	5.0	mg/kg	EPA 6010b	
Zinc	**38**	1.0	mg/kg	EPA 6010b	
Mercury	**0.13**	0.10	mg/kg	EPA 7471A Soil	

SunStar Laboratories, Inc.

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Joann Marroquin

Joann Marroquin For Taili Iinuma, Project Manager

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949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	22E0008	05/02/22	05/06/22	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*90.3 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	22E0004	05/02/22	05/03/22	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**57**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/03/22	"	
Cadmium	ND	2.0	"	"	"	"	05/03/22	"	
Chromium	**26**	2.0	"	"	"	"	"	"	
Cobalt	**4.1**	2.0	"	"	"	"	"	"	
Copper	**5.4**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**2.8**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**25**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	22E0005	05/02/22	05/03/22	EPA 7471A Soil	

SunStar Laboratories, Inc.



Joann Marroquin For Taili Iinuma, Project Manager

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

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Joann Marroquin For Taili Iinuma, Project Manager

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	2.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Acetone	ND	5.0	"	"	"	"	"	"	
Methyl ethyl ketone	ND	5.0	"	"	"	"	"	"	
Methyl isobutyl ketone	ND	5.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*75.4-139*		"	"	"	"	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*91.8 %*	*73.1-125*		*22E0023*	*05/02/22*	*05/03/22*	*EPA 8260B*	
Surrogate: Toluene-d8		*97.8 %*	*82.6-117*		*"*	*"*	*"*	*"*	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	22E0008	05/02/22	05/06/22	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.0 %*	*65-135*		*"*	*"*	*"*	*"*	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	22E0004	05/02/22	05/03/22	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**45**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/03/22	"	
Cadmium	ND	2.0	"	"	"	"	05/03/22	"	
Chromium	**26**	2.0	"	"	"	"	"	"	
Cobalt	**6.2**	2.0	"	"	"	"	"	"	
Copper	**8.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**8.3**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**45**	5.0	"	"	"	"	"	"	
Zinc	**38**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	**0.13**	0.10	mg/kg	1	22E0005	05/02/22	05/03/22	EPA 7471A Soil	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	2.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Acetone	ND	5.0	"	"	"	"	"	"	
Methyl ethyl ketone	ND	5.0	"	"	"	"	"	"	
Methyl isobutyl ketone	ND	5.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.8 %*	*75.4-139*		"	"	"	"	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane	*96.4 %*		*73.1-125*		*22E0023*	*05/02/22*	*05/03/22*	*EPA 8260B*	
Surrogate: Toluene-d8	*95.2 %*		*82.6-117*		*"*	*"*	*"*	*"*	

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Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0008 - EPA 3550B GC										
Blank (22E0008-BLK1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*91.7*		*"*	*100*		*91.7*	*65-135*			
LCS (22E0008-BS1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C13-C28 (DRO)	400	10	mg/kg	500		80.9	75-125			
Surrogate: p-Terphenyl	*91.7*		*"*	*100*		*91.7*	*65-135*			
LCS Dup (22E0008-BSD1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C13-C28 (DRO)	410	10	mg/kg	500		82.3	75-125	1.76	20	
Surrogate: p-Terphenyl	*91.9*		*"*	*100*		*91.9*	*65-135*			

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Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0004 - EPA 3050B										
Blank (22E0004-BLK1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							
LCS (22E0004-BS1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	102	5.0	mg/kg	100		102	75-125			
Barium	99.9	1.0	"	100		99.9	75-125			
Cadmium	99.0	2.0	"	100		99.0	75-125			
Chromium	99.8	2.0	"	100		99.8	75-125			
Lead	102	3.0	"	100		102	75-125			
Matrix Spike (22E0004-MS1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	81.2	5.0	mg/kg	100	0.812	80.4	75-125			
Barium	106	1.0	"	100	27.1	78.9	75-125			
Cadmium	80.6	2.0	"	100	0.153	80.5	75-125			
Chromium	86.7	2.0	"	100	7.24	79.5	75-125			
Lead	75.1	3.0	"	100	2.48	72.6	75-125			QM-05

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Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0004 - EPA 3050B										
Matrix Spike Dup (22E0004-MSD1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	78.7	5.0	mg/kg	100	0.812	77.9	75-125	3.03	20	
Barium	113	1.0	"	100	27.1	86.0	75-125	6.41	20	
Cadmium	75.1	2.0	"	100	0.153	74.9	75-125	7.15	20	QM-05
Chromium	84.2	2.0	"	100	7.24	76.9	75-125	2.99	20	
Lead	75.9	3.0	"	100	2.48	73.4	75-125	1.07	20	QM-05

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0005 - EPA 7471A Soil										
Blank (22E0005-BLK1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	ND	0.10	mg/kg							
LCS (22E0005-BS1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.347	0.10	mg/kg	0.410		84.8	80-120			
Matrix Spike (22E0005-MS1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.329	0.10	mg/kg	0.385	ND	85.6	75-125			
Matrix Spike Dup (22E0005-MSD1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.279	0.10	mg/kg	0.397	ND	70.3	75-125	16.6	20	QM-05

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Joann Marroquin

Joann Marroquin For Taili Iinuma, Project Manager

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949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
Blank (22E0023-BLK1)				Prepared & Analyzed: 05/02/22						
Bromobenzene	ND	2.5	ug/kg							
Bromochloromethane	ND	2.5	"							
Bromodichloromethane	ND	2.5	"							
Bromoform	ND	2.5	"							
Bromomethane	ND	2.5	"							
n-Butylbenzene	ND	2.5	"							
sec-Butylbenzene	ND	2.5	"							
tert-Butylbenzene	ND	2.5	"							
Carbon tetrachloride	ND	2.5	"							
Chlorobenzene	ND	2.5	"							
Chloroethane	ND	2.5	"							
Chloroform	ND	2.5	"							
Chloromethane	ND	2.5	"							
2-Chlorotoluene	ND	2.5	"							
4-Chlorotoluene	ND	2.5	"							
Dibromochloromethane	ND	2.5	"							
1,2-Dibromo-3-chloropropane	ND	5.0	"							
1,2-Dibromoethane (EDB)	ND	2.5	"							
Dibromomethane	ND	2.5	"							
1,2-Dichlorobenzene	ND	2.5	"							
1,3-Dichlorobenzene	ND	2.5	"							
1,4-Dichlorobenzene	ND	2.5	"							
Dichlorodifluoromethane	ND	2.5	"							
1,1-Dichloroethane	ND	2.5	"							
1,2-Dichloroethane	ND	2.5	"							
1,1-Dichloroethene	ND	2.5	"							
cis-1,2-Dichloroethene	ND	2.5	"							
trans-1,2-Dichloroethene	ND	2.5	"							
1,2-Dichloropropane	ND	2.5	"							
1,3-Dichloropropane	ND	2.5	"							
2,2-Dichloropropane	ND	2.5	"							
1,1-Dichloropropene	ND	2.5	"							
cis-1,3-Dichloropropene	ND	2.5	"							
trans-1,3-Dichloropropene	ND	2.5	"							
Hexachlorobutadiene	ND	2.5	"							
Isopropylbenzene	ND	2.5	"							

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
Blank (22E0023-BLK1)				Prepared & Analyzed: 05/02/22						
p-Isopropyltoluene	ND	2.5	ug/kg							
Methylene chloride	ND	10	"							
Naphthalene	ND	2.5	"							
n-Propylbenzene	ND	2.5	"							
Styrene	ND	2.5	"							
1,1,2,2-Tetrachloroethane	ND	2.5	"							
1,1,1,2-Tetrachloroethane	ND	2.5	"							
Tetrachloroethene	ND	2.5	"							
1,2,3-Trichlorobenzene	ND	2.5	"							
1,2,4-Trichlorobenzene	ND	2.5	"							
1,1,2-Trichloroethane	ND	2.5	"							
1,1,1-Trichloroethane	ND	2.5	"							
Trichloroethene	ND	2.5	"							
Trichlorofluoromethane	ND	2.5	"							
1,2,3-Trichloropropane	ND	2.5	"							
1,3,5-Trimethylbenzene	ND	2.5	"							
1,2,4-Trimethylbenzene	ND	2.5	"							
Vinyl chloride	ND	2.5	"							
Benzene	ND	2.5	"							
Toluene	ND	2.5	"							
Ethylbenzene	ND	2.5	"							
m,p-Xylene	ND	5.0	"							
o-Xylene	ND	2.5	"							
Acetone	ND	5.0	"							
Methyl ethyl ketone	ND	5.0	"							
Methyl isobutyl ketone	ND	5.0	"							
2-Hexanone (MBK)	ND	5.0	"							
Surrogate: 4-Bromofluorobenzene	*52.6*		*"*	*50.0*		*105*	*75.4-139*			
Surrogate: Dibromofluoromethane	*46.4*		*"*	*50.0*		*92.7*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.6*	*82.6-117*			

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
LCS (22E0023-BS1)				Prepared & Analyzed: 05/02/22						
Chlorobenzene	53.0	2.5	ug/kg	50.0		106	65.2-124			
1,1-Dichloroethene	52.1	2.5	"	50.0		104	60.9-131			
Trichloroethene	53.7	2.5	"	50.0		107	62.1-126			
Benzene	49.9	2.5	"	50.0		99.8	65.3-127			
Toluene	49.7	2.5	"	50.0		99.4	64.3-122			
Surrogate: 4-Bromofluorobenzene	*48.9*		*"*	*50.0*		*97.9*	*75.4-139*			
Surrogate: Dibromofluoromethane	*47.0*		*"*	*50.0*		*94.1*	*73.1-125*			
Surrogate: Toluene-d8	*49.6*		*"*	*50.0*		*99.3*	*82.6-117*			
Matrix Spike (22E0023-MS1)	**Source: T221277-02**			Prepared & Analyzed: 05/02/22						
Chlorobenzene	46.0	2.5	ug/kg	50.0	ND	92.0	65.2-125			
1,1-Dichloroethene	41.2	2.5	"	50.0	ND	82.5	60.9-131			
Trichloroethene	44.8	2.5	"	50.0	ND	89.6	62.1-126			
Benzene	41.6	2.5	"	50.0	ND	83.2	65.3-127			
Toluene	42.8	2.5	"	50.0	ND	85.7	64.3-125			
Surrogate: 4-Bromofluorobenzene	*48.9*		*"*	*50.0*		*97.9*	*75.4-139*			
Surrogate: Dibromofluoromethane	*45.6*		*"*	*50.0*		*91.2*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.7*	*82.6-117*			
Matrix Spike Dup (22E0023-MSD1)	**Source: T221277-02**			Prepared & Analyzed: 05/02/22						
Chlorobenzene	48.0	2.5	ug/kg	50.0	ND	95.9	65.2-125	4.13	20	
1,1-Dichloroethene	47.0	2.5	"	50.0	ND	94.1	60.9-131	13.1	20	
Trichloroethene	47.7	2.5	"	50.0	ND	95.3	62.1-126	6.25	20	
Benzene	44.8	2.5	"	50.0	ND	89.5	65.3-127	7.34	20	
Toluene	44.6	2.5	"	50.0	ND	89.2	64.3-125	4.02	20	
Surrogate: 4-Bromofluorobenzene	*49.1*		*"*	*50.0*		*98.1*	*75.4-139*			
Surrogate: Dibromofluoromethane	*47.3*		*"*	*50.0*		*94.7*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.6*	*82.6-117*			

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Notes and Definitions

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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25712 Commercentre Dr
Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Ninyo & Moore
Address: 475 Goddard, Suite 200
Phone: 949-753-7070 Fax:
Project Manager: Aura Scharf ascharf@ninyoandmoore.com

Date: 4/29/22 Page: 1 Of 1
Project Name: Arroyo Seco - San Rafael Water Reuse & Natural Stream Restoration Project
Collector: Allison Prizlow (ANP) Client Project #: 211880001
Batch #: T221276 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260 (VOCs)	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals					Laboratory ID #	Comments/Preservative	Total # of containers
DRUM#1_B-3	4/27/22	3:10	Soil	4oz Jar	X							X	X					1	one test	
DRUM#2_B-2A	4/28/22	11:30	Soil	4oz Jar	X							X	X					2	composite 2 JARS (one test)	
DRUM#1_B-1A	4/28/22	3:35	Soil	4oz Jar	X							X	X					3		

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
Allison Prizlow	4/29/22; 2:59		4/29/22; 2:59
	4/29/22; 4:30		4/29/22 16:30
	4/29/22 16:55		4.29.22 1655

Total # of containers
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold 2.7°C
Turn around time: STD

Notes
2 tests total

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

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SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T221276

Client Name: NINYO & MOORE

Project: ARROYO SECO. SAN RAFAEL WATER REUSE 2 NATURAL STREAM RESTORATION

Delivered by: ☐ Client ☑ SunStar Courier ☐ GLS ☐ FedEx ☐ UPS

If Courier, Received by: MARVIN

Date/Time Courier Received: 4-29-22 16:30

Lab Received by: DAVE

Date/Time Lab Received: 4-29-22 16:55

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due: 8/24/22

Temperature: Cooler #1 2.0	°C +/- the CF (+0.1 °C)	= 2.1	°C corrected temperature
Temperature: Cooler #2	°C +/- the CF (+0.1 °C)	=	°C corrected temperature
Temperature: Cooler #3	°C +/- the CF (+0.1 °C)	=	°C corrected temperature
Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☑ Yes ☐ No ☐ N/A	
If NO:			
Samples received on ice?	☐ Yes	☐ No → **Complete Non-Conformance Sheet**	
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ No → **Complete Non-Conformance Sheet**	

Custody seals intact on cooler/sample	☐ Yes	☐ No*	☑ N/A
Sample containers intact	☑ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☑ Yes	☐ No*	
Total number of containers received match COC	☑ Yes	☐ No*	
Proper containers received for analyses requested on COC	☑ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☑ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: MV 4-29-22

Comments:

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T221276

Client: **Ninyo & Moore** **Project Manager:** **Taili Iinuma**

Project: **Arroyo Seco - San Rafael Water Reuse 2 Natural** **Project Number:** **211880001**

Report To:

Ninyo & Moore
Aura Scharf
475 Goddard, Ste. 200
Irvine, CA 92618

Date Due:	05/09/22 17:00 (5 day TAT)		
Received By:	Dave Berner	Date Received:	04/29/22 16:55
Logged In By:	Jennifer Berger	Date Logged In:	05/02/22 11:31

Samples Received at: **2.7°C**

Custody Seals	No	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirı	No		

Analysis	Due	TAT	Expires	Comments
T221276-01 Drum #1_B-3 [Soil] Sampled 04/27/22 15:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/09/22 15:00	5	10/24/22 15:10	
8015 Carbon Chain	05/09/22 15:00	5	05/11/22 15:10	
8260	05/09/22 15:00	5	05/11/22 15:10	
T221276-02 Drum #2_B-2A [Soil] Sampled 04/28/22 11:30 (GMT-08:00) Pacific Time (US &				
[NO ANALYSES]				
T221276-03 Drum #1_B-1A [Soil] Sampled 04/28/22 15:35 (GMT-08:00) Pacific Time (US &				
[NO ANALYSES]				
T221276-04 Composite 2:1 Drum#2_B-2A - Drum #1_B-1A [Soil] Sampled 04/28/22 11:30 (GMT-08:00) Pacific Time (US &				**Composite samples Drum#2_B-2A, Drum#1_B-1A # 2,3**
6010 Title 22	05/09/22 15:00	5	10/25/22 11:30	
8015 Carbon Chain	05/09/22 15:00	5	05/12/22 11:30	
8260	05/09/22 15:00	5	05/12/22 11:30	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By Date

Manifest

SOIL SAFE OF CA – TPST
Non-Hazardous Soils

↓ Manifest # ↓

Date of Shipment:	Responsible for Payment:	Transport Truck #:	Facility #:	Approval Number:	Load #
6/6/22		576 / 476	A07	AS-4353	bb11

Generator and/or Consultant

Generator's Name and Billing Address: ARROYO PARK STONEY DRIVE SOUTH PASADENA, CA 91030	Generator's Phone #: 213-440-3543 Person to Contact: FAX#:	Customer Account Number
Consultant's Name and Billing Address:	Consultant's Phone #: Person to Contact: FAX#:	Customer Account Number
Generation Site (Transport from): *(name & address)* ARROYO PARK STONEY DRIVE SOUTH PASADENA, CA 91030	Site Phone #: Person to Contact: FAX#:	
Designated Facility (Transport to): *(name & address)* SOIL SAFE 12328 HIBISCUS AVENUE ADELANTO, CA 92301	Facility Phone #: (800) 862-8001 Person to Contact: JOE PROVANSAL FAX#: (760) 246-8004	
Transporter Name and Mailing Address: BELSHIRE 25971 TOWNE CENTRE DRIVE FOOTHILL RANCH, CA 92610 BESI: 342662	Transporter's Phone #: 949-460-5200 Person to Contact: LARRY MOOTHART FAX#: 949-460-5210	CAR000183913 1629169 Customer Account Number

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐	3 DM	Soil ~~Safe~~	39520	38100	1720
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐					86

List any exception to items listed above: Scale Ticket # 170135

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils descried in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: Generator ☒ Consultant ☐	Signature and date:	Month	Day	Year
VICTOR MAGANA	MC	5	20	22

Transporter

Transporter's certification: I/We acknowledge receipt of the soil referenced above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that the soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name:	Signature and date:	Month	Day	Year
Ivan Garcia		5	20	22

Recycling Facility

Discrepancies:

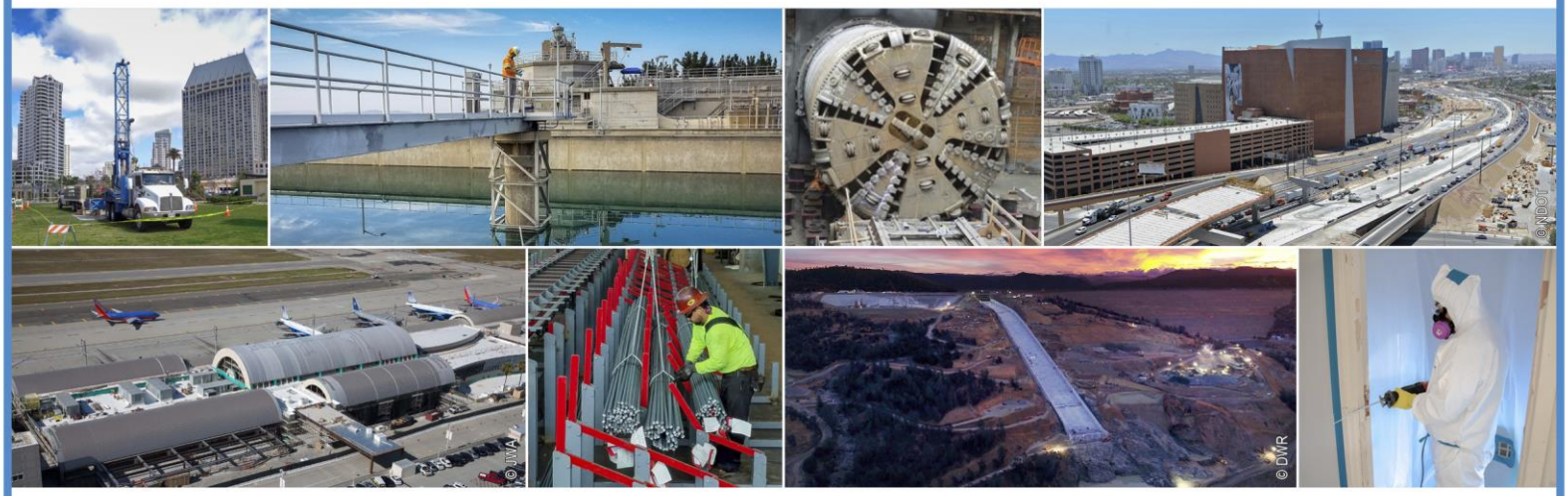
Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name:	Signature and date:
Joe Provansal / Barry Mook / Bill Bishop	6.6.22

Please print or type.

ARROYOPA/2857517

TRANSPORTER COPY



475 Goddard, Suite 200 | Irvine, California 92618 | p. 949.753.7070

ARIZONA | CALIFORNIA | COLORADO | NEVADA | TEXAS | UTAH

ninyoandmoore.com

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Appendix F-2

San Pascual Geotechnical Evaluation

Geotechnical Evaluation

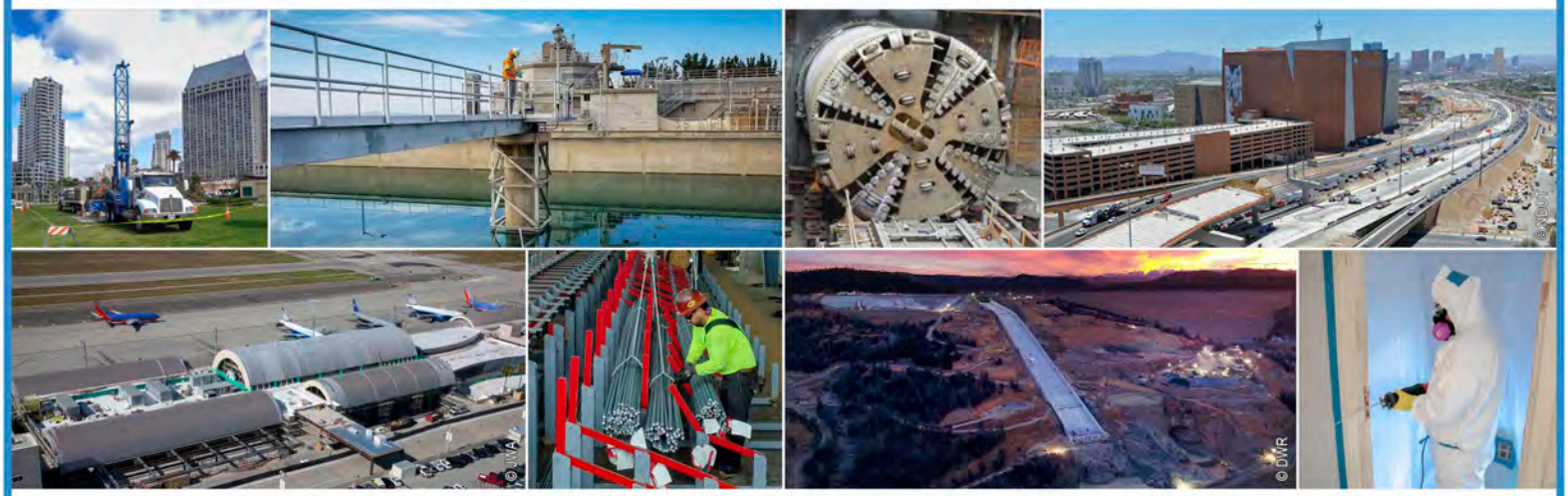
San Pascual Treatment Wetland Arroyo Seco Water Reuse and Natural Stream Restoration Project

South Pasadena, California

Craftwater Engineering, Inc.

45 South Arroyo Parkway, B6 | Pasadena, California 91105

June 17, 2022 | Project No. 211880001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

CELEBRATING 35 YEARS

Geotechnical Evaluation
San Pascual Treatment Wetland Arroyo Seco Water Reuse and Natural Stream Restoration Project
South Pasadena, California

Ms. Courtney Semlow
Craftwater Engineering, Inc.
45 South Arroyo Parkway, B6 | Pasadena, California 91105

June 17, 2022 | Project No. 211880001

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Senior Staff Geologist

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Principal Engineer

Greg M. Corson, PG, CEG
Principal Geologist

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AES/GMC/DBC/sc

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C – Analytical Test Results (Drum Characterization)

1 INTRODUCTION

In accordance with your request and authorization, we have performed a geotechnical evaluation for the Arroyo Seco Water Reuse and Natural Stream Restoration project located along the lower Arroyo Seco in the Cities of Pasadena and South Pasadena, California (Figure 1). We understand that the purpose of the project is to reduce the Maximum Total Daily Loads within the Upper Los Angeles River by improving the water quality within Arroyo Seco and its tributary, San Rafael Creek. In general, the project consists of the construction/rehabilitation of two stormwater treatment wetlands along Arroyo Seco, including the San Rafael Treatment Wetland and the San Pascual Treatment Wetland. Each wetland location will include additional site improvements, such as stormwater diversion structures, stormwater pre- and post-treatment facilities, restoration of existing riparian habitats, and development of recreational opportunities. The purpose of our study was to evaluate the subsurface soil and geologic conditions at each wetland location, including the infiltration rates of the on-site soils, in order to provide geotechnical recommendations for the design and construction of the proposed improvements. This report presents our findings, conclusions, and geotechnical recommendations for design and construction of the proposed improvements at the site of the San Pascual Treatment Wetland (San Pascual Site). Our findings, conclusions and geotechnical recommendations associated with the site of the San Rafael Treatment Wetland (San Rafael Site) are provided under separate cover (Ninyo & Moore, 2022).

2 SCOPE OF SERVICES

Our scope of services for the San Pascual Site included the following:

- Project coordination and planning with subcontractors and personnel from Craftwater Engineering, Inc., the design team, and the Cities of Pasadena and South Pasadena, and attendance at a project kick-off meeting.
- Review of readily available background materials, including published topographic maps, geologic maps, fault and seismic hazard maps, groundwater data, stereoscopic aerial photographs, project related plans, and in-house geotechnical information.
- Acquisition of well and encroachment permits from the City of South Pasadena.
- Field reconnaissance to observe and document the site conditions, mark-out proposed hollow-stem-auger (HSA) boring locations for underground utility clearance by Underground Service Alert.
- Subsurface exploration consisting of the drilling, sampling, and logging of seven HSA borings, ranging in depths from approximately 10 feet to 31½ feet.
- Field percolation testing in three of the HSA borings in general accordance with the 2021 Los Angeles County Department of Public Work's (LACDPW) Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration.

- Geotechnical laboratory testing of representative soil samples to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve, Atterberg limits, direct shear strength, R-value, and soil corrosivity.

- Data compilation and engineering analysis of the information obtained from our background review, subsurface evaluation, percolation testing, and laboratory testing.

- Preparation of this geotechnical report presenting our findings, conclusions, and recommendations pertaining to the design and construction of the proposed improvements.

3 SITE DESCRIPTION

The San Pascual Site consists of a triangular-shaped lot along the east side of the lower Arroyo Seco Channel along the southern end of the Repetto Hills within the City of South Pasadena. The lot is bounded on the west and southwest by the Arroyo Seco channel, on the northeast and east by Stoney Drive, and on the north by San Pascual Drive. Arroyo Park is located on the opposite side of Stoney Drive from the site. The lot consists of an existing wetland area sloped downward toward the middle portions of the site approximately 8 to 10 feet below the surrounding ground surfaces. The depressed area, wetland area is covered with thick vegetation of bushes, grasses, and palm trees. Water was present on the ground surface within portions of the wetland area during our subsurface exploration discussed below. An outlet to Arroyo Seco is located at the southern end of the wetland. The north and south ends of the site consist of undeveloped dirt and gravel areas. A dirt pathway lined by a wood fence traverses the northeast and southeast sides of the basin. According to the County of Los Angeles (2022), elevations of the site ground surface around the perimeter of the wetland range from approximately 608 feet above mean sea level (MSL) at the north end of the site to 596 feet above MSL at the south end (Figure 2). The bottom elevations of the existing wetland and south outlet are approximately 590 and 578 feet, respectively. The adjacent channel of Arroyo Seco is concrete-lined and on the order of 12 to 15 feet deep (el. 590 to 578 feet MSL adjacent to the site).

4 PROJECT DESCRIPTION AND PROPOSED CONSTRUCTION

According to Craftwater (2020), the existing wetland will be improved to become a new wetland with a storage capacity of up to approximately 6.5 acre-feet. The new wetland will have ponding depth of approximately 5 feet and footprint of approximately 1.5 acres. It is anticipated that new slopes will be constructed along the outside of the wetland. Water will be diverted from the Arroyo Seco with a new approximately 30-foot-long by 3-foot-wide, by 1.5-foot-deep concrete drop-inlet structure installed along the bottom of the channel northwest of the site. A 30-inch-diameter pipeline will be constructed at the bottom of the structure to collect and divert water to the northern end of the wetland/reservoir. A hydrodynamic separator for pre-treatment of the water and

actuated valve vault will be installed along the pipeline. A second pipeline, 18-inches in diameter, will be constructed at the southern end of the wetland/reservoir to return treated water to Arroyo Seco and a harvesting unit to collect and divert water for use as landscape irrigation at the adjacent Arroyo Park. The second pipeline will also include an in-line post-treatment filtration unit, actuated valve, and pump station. It is anticipated that the pipelines and structures (i.e., actuated valve boxes, hydrodynamic separator, pump station, filtration unit, and harvesting unit) will be installed to depths of up to approximately 15 feet in depth. Other site improvements include new pedestrian walkways/trails, fencing, landscaping, and a new parking lot with permeable pavers at the north end of the site.

5 SUBSURFACE EVALUATION AND LABORATORY TESTING

Our subsurface evaluation was conducted on April 26, 27, and 28, 2022, and consisted of the drilling, logging, and sampling of seven HSA borings (B-1A, B-2A, B-3A, and P-1A through P-4A). The borings were drilled using a limited-access drill rig with 8-inch diameter augers along the perimeter of the proposed wetland. The wetland area was inaccessible due to the presence of the heavy vegetation and water on the ground surface. Borings B-1A, B-2A, and B-3A were drilled to depths of approximately 30.3, 30.8, and 31.5 feet. Boring P-1A was drilled to a depth of approximately 10.2 feet and borings P-2A, P-3A, and P-4A were drilled to depths of approximately 10.1 feet. The borings were logged in the field by a representative of Ninyo & Moore and representative bulk and relatively undisturbed soil samples were collected from the borings at selected depths for laboratory testing. Percolation testing was performed in borings P-1A through P-4A as further discussed in Section 8 of this report. Logs of the exploratory borings are provided in Appendix A. The approximate locations of the borings are presented on Figures 2 and 3. The borings were backfilled with cement-bentonite and/or soil cuttings upon completion of the drilling and percolation testing.

Geotechnical laboratory testing of representative soil samples included tests to evaluate in-situ moisture content and dry density, gradation, percentage of particles finer than the No. 200 sieve direct shear strength, Atterberg limits, and soil corrosivity. Moisture and density test results are presented on the boring logs in Appendix A. The remaining test results are presented in Appendix B.

Soil cuttings from borings backfilled with cement-bentonite grout were placed in 55-gallon drums, and composite soil samples of the drummed soil were collected in 8-ounce jars for waste characterization. The samples were stored in a chilled cooler and delivered to SunStar Laboratories for analytical testing under chain-of-custody protocol. The samples were tested for total petroleum hydrocarbons (gas and diesel range) per United Stated Environmental Protection

Agency (EPA) Test Method 8015B, Title 22 metals per EPA Test Methods 6010B/7470/7471, and volatile organic compounds per EPA Test Method 8260B. Based on the characterization test results, the drums were disposed at an approved landfill (Soil Safe in Adelanto, California) by a licensed transportation subcontractor (Belshire) as non-hazardous material. The analytical test results are provided in Appendix C.

6 GEOLOGIC AND SUBSURFACE CONDITIONS

The project site is located within the Los Angeles Basin of the Transverse Ranges Geomorphic Province (Norris and Webb, 1990). The basin has been divided into four blocks, the northeastern, northwestern, southwestern, and central blocks that are separated by prominent fault systems. The site is located at the northern edge of the northeastern block, which consists of a synclinal basin between the San Gabriel to the north and Whittier fault zone to the south. The basin is infilled with up to 12,000 feet of marine Cenozoic sedimentary rock and Miocene volcanics overlying metamorphic/granitic basement rock. The basin rocks are generally overlain by variably aged alluvial fan and stream deposits shed from the mountains on the north.

The site is located along Arroyo Seco, where the drainage exits the southern end of the Repetto Hills. According to Campbell, et al. (2014), deposits of late Pleistocene-age young alluvium consisting of unconsolidated, stream-deposited silt, sand and gravel (Figure 4) are present along the bottom of the channel and beneath the site. These younger deposits are confined by sedimentary bedrock and older alluvial fan/terrace deposits within the Repetto Hills to the north and older alluvial deposits of varying age to the south. The bedrock and terrace deposits are in fault contact with the older alluvial deposits due to the east to west trending Raymond fault. Campbell, et al. (2014) indicates that the fault crosses through the site. The bedrock north of the fault is mapped as siltstone, sandstone, and conglomeratic units of the Topanga Formation. The California Department of Mines and Geology (CDMG, 1998) has mapped the young alluvium beneath the site as Holocene-aged deposits of loose to medium dense, sand, silt and gravel.

Materials encountered during our subsurface exploration generally consisted of undocumented fill younger alluvium, older alluvium, and Topanga Formation bedrock as described below. Detailed descriptions of the materials encountered in our borings are presented on the boring logs in Appendix A.

6.1 Undocumented Fill

Undocumented fill was encountered in our borings B-1A, P-1A, P-2A, and P-3A performed in the northern portions of the park (i.e., area of lower ground elevation) to depths ranging from approximately 3 to 4½ feet. The fill generally consisted of light brown and brown, moist, medium

dense, sandy silt and silty sand with variable amounts of gravel and cobbles. Information regarding the placement of existing fill including ground preparation, remedial excavation, methods of fill placement, and the degree of compaction during placement, is unknown to us.

6.2 Younger Alluvium

Younger alluvium was encountered beneath the undocumented fill to depths ranging from approximately 9 to 14 feet in borings B-1A, B-2A, B-3A, and P-4A, and to the total depths explored (approximately 10 feet) in borings P-1A, P-2A, and P-3A. The younger alluvium generally consisted of interbedded granular deposits of light brown, brown, grayish brown, light grayish brown, olive brown, olive, grayish brown, dark gray, and light gray, moist to wet, loose to very dense, silty sand and poorly graded sand with silt with variable amounts of gravel, cobbles, and possible boulders.

6.3 Older Alluvium

Older alluvium was encountered beneath the fill and younger alluvium encountered in boring B-3A at a depth of approximately 9 feet. The older alluvium extended to a depth of approximately 29 feet and generally consisted of reddish brown and brown, moist, hard, sandy lean clay interbedded with yellowish brown, moist, mottled, very dense silty sand with gravel, cobbles, and possible boulders. Clasts of sandstone and siltstone were also present within the granular deposits.

6.4 Topanga Formation

Topanga Formation bedrock was encountered at depths ranging from approximately 9½ to 14 feet in borings B-1A, B-2A, and P-4A and at a depth of approximately 29 feet in boring B-3A. The bedrock generally consisted of gray, moist to wet, weakly cemented, sandstone with thin to thick laminations of dark brown, weakly indurated, siltstone; and dark brown, dark gray, and yellowish brown, moist to wet, soft, weakly indurated, claystone and siltstone with interbeds and laminations of light gray, moist, weakly cemented sandstone. The bedrock was generally ranged from soft to moderately soft, with the exception of hard, strongly cemented, sandstone that was encountered at a depth of approximately 29 feet in boring B-2A. The bedrock was variably weathered with some intensely weathered siltstone and claystone encountered in the upper portions of the borings.

7 GROUNDWATER

Seepage was encountered during drilling in borings B-1A, B-2A, and P-4A at depths of approximately 10.3, 12, and 8.5 feet, respectively. The depths of seepage suggest that perched

groundwater is present at the contact between the younger alluvium and bedrock. The proximity of the borings to the edge of the wetland are an influence on the seepage conditions encountered. Groundwater was measured in borings B-1A and B-2A at depths of approximately 20 and 25.5 feet, respectively, after completion of drilling. Groundwater was not encountered in boring B-3A to the total depth explored of approximately 31.5 feet. CDMG (1998) indicates that the historic high depth to groundwater at the project site is 20 feet.

Fluctuations in the level of groundwater will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, and other factors that were not evident at the time of our field evaluation.

8 FIELD PERCOLATION TESTING

Percolation testing was performed in our borings P-1A, P-2A, and P-3A in general accordance with the 2021 LACDPW Guidelines for Geotechnical Investigation and Reporting Low Impact Development Stormwater Infiltration. Percolation testing was not performed in boring P-4A due to the presence of standing water at the bottom of the boring (i.e., seepage encountered at approximately 8.5 feet). The testing was performed to evaluate the infiltration rates of the on-site soils at the approximate invert depth of the proposed wetland for use in the project design. The percolation testing was performed within the younger granular alluvial deposits. The approximate locations of the percolation test borings are shown on Figures 2 and 3.

Preparation of each boring for percolation testing included the installation of a 2-inch-diameter slotted polyvinyl chloride (PVC) pipe in each boring and backfilling the bottom approximately 5 feet of annular space between the borehole wall and pipe with clean gravel. The infiltration zones were pre-soaked with water for at least one hour prior to performing percolation testing. After the borings were pre-soaked, falling-head percolation testing was performed in the borings.

The falling-head test method involved placing clean water into the PVC pipe to establish a head of water and measuring the rate at which the water level dropped in the pipe at consecutive time intervals (approximately 10 minutes). The test was repeated at each location until three consecutive measurements provided similar results and a stabilized rate was obtained. The field percolation rates were calculated by measuring the total volume of water infiltrated during the time interval and dividing by the surface area of the tested zone of the respective boring. The measured field percolation rates are presented in Table 1.

The 2021 LACDPW guidelines indicate that the measured field percolation rates should be reduced to account for the long-term performance of the proposed BMPs by dividing the field

rates by the “Total Reduction Factor (RF).” They define the RF as the sum of the "test-specific" reduction factor (RF_t), the "site variability" reduction factor (RF_v), and the "long-term siltation, plugging, and maintenance" reduction factor (RF_s) (i.e., $RF=RF_t+RF_v+RF_s$). The guidelines (CLADPW, 2021) indicate that the RF_t is applied to account for variations in the direction of flow during the test and the reliability of the different test methods and ranges from 1 to 3. We recommend using an RF_t value of 2 for the small dimeter boring test method used in this evaluation. The RF_v value is applied to account for site variability, number of tests, and thoroughness of the subsurface investigation and ranges from 1 to 3. Based on our explorations and the potential for variable site conditions associated with potential faulting at the site, we recommend using an RF_v value of 2. The long-term siltation, plugging, and maintenance value (RF_s) also ranges from 1 to 3 and will generally vary on the level of pre-treatment performed prior to infiltration and the level of future maintenance of the system. For the purposes of this evaluation, we have assumed an RFs value of 1; however, the RF_s value should be provided by the BMP designer. The RF_t, RF_v, RF_s, and resulting RF values used in our analysis are presented in Table 1. The adjusted percolation rates based on these values are also presented in Table 1.

Table 1 – Percolation Test Results

Test Boring	Test Type	Approximate Depth of Tested Zone (feet)	Field Percolation Rate (inches/hour)	Reduction Factor				Adjusted Percolation Rate (inches/hour)
				RF_t	RF_v	RF_s	RF	
P-1A	Falling Head	8.0-10.2	13.7	2	2	1	5	2.8
P-2A	Falling Head	8.0-10.1	15.4	2	2	1	5	3.1
P-3A	Falling Head	8.0-10.1	14.1	2	2	1	5	2.8

Notes:
RF_t – Test Specific Reduction Factor
RF_v – Site Variability Reduction Factor
RF_s – Long-Term Siltation, Plugging, and Maintenance Reduction Factor (To be adjusted by the BMP designer)
RF – Total Reduction Factor

Based on our evaluation, we recommend that an adjusted percolation rate of 2.8 inches per hour, following adjustments by the BMP designer for RF_s, be used for project design.

In addition, we recommend that new or existing buildings be set-back from the proposed infiltration facility a minimum of 15 feet or a distance where the bottom of the lowest foundation element of the structure is at least 10 horizontal feet outside of an imaginary 1:1 (horizontal to vertical) plane projected downward and outward from the zone of infiltration.

9 FLOOD HAZARDS

Based on our review of flood insurance rate maps for the project area (Federal Emergency Management Agency [FEMA], 2008), the project site is not located in the 100-year Flood Hazard Area. The site is located within “Other Flood Areas – Zone X,” which includes areas potentially

subject to 500-year floods, areas of 100-year floods with average depths of less than one foot, and areas protected by levees.

10 FAULTING AND SEISMICITY

The site is in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered significant during the design life of the proposed project. Figure 5 shows the approximate site location relative to the major faults in the region. The site is located within a State of California Earthquake Fault Zone (EFZ) (formerly known as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 2018) associated with the Raymond fault (Figures 4, 6 and 7).

The principal seismic hazards evaluated at the subject site are surface fault rupture, ground motion, and liquefaction. A brief description of these principal seismic hazards is discussed in the following sections.

10.1 Surface Fault Rupture

Surface fault rupture is the offset or rupturing of the ground surface by relative displacement across a fault during an earthquake. As discussed, the project is located with the EFZ associated with the Raymond fault and is possibly underlain by one or more active splays of the fault. According to the State of California Fault Evaluation Report (FER)(CGS, 2017) prepared for the Raymond fault, the fault is buried by the younger alluvial deposits where it crosses Arroyo Seco. Previous studies discussed in the FER map potential (inferred) locations of the fault beneath Arroyo Seco. Many of these inferred locations cross beneath the southern end and/or middle section of the site (Figure 7). Accordingly, the potential for surface rupture at the site during an earthquake along this section of the Raymond fault is considered high. Lurching or cracking of the ground surface as a result of seismic events on other nearby faults, or deeper earthquakes along the Raymond fault, is also possible.

Since the project does not involve the construction of structures for human occupancy, as defined by the AP fault act of 1972, additional fault studies, including subsurface and/or geophysical techniques, detailed review of the FER and previous fault studies by others, and detailed review of other geotechnical/geologic documents, were not performed as a part of this evaluation. However, our subsurface exploration suggests that a fault may be present at the southern end of the site, between borings B-3A and B-4A, as suggested the deeper depth to bedrock (29 feet in boring B-3A compared to 9 ½ to 14 feet in the other borings) and the section of older alluvium that was encountered in boring B-3A. An alternative explanation of the differences could be a steep

formational contact between borings B-3A and B-4A. Additional studies would need to be performed in order to further evaluate these materials and their relationships.

10.2 Ground Motion

Considering the proximity of the site to active faults capable of producing a maximum moment magnitude of 6.0 or more, the project area has a high potential for experiencing strong ground motion. The 2019 California Building Code (CBC) specifies that the risk-targeted maximum considered earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The average shear wave velocity (V_S) for the upper 30 meters of soil (V_{S30}) is approximately 468 meters per second (m/s) (CGS, 2017). Accordingly, the site is considered to be a Site Class C. The horizontal peak ground acceleration that corresponds to the MCE_R for the project area was calculated as 0.92g using the 2019 Structural Engineers Association of California (SEAOC)/Office of Statewide Health Planning and Development (OSHPD) seismic design tool (web-based). Spectral response acceleration parameters, consistent with the 2019 CBC, are also provided in Section 12.3 of the report.

The 2019 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the mapped maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA_M) with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-16 Standard. The MCE_G PGA is based on the geometric mean PGA with a 2 percent probability of exceedance in 50 years. The PGA_M was calculated as 1.1g using the 2019 SEAOC/OSHPD seismic design tool (web-based).

10.3 Liquefaction

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35 percent and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure and causes the soil to behave as a fluid for a brief period of time. Liquefaction is known generally to occur in saturated or near saturated cohesionless soils at depths shallower than 50 feet. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

The State of California Hazard Zones map (CGS, 2022) indicates that the subject site is located in an area mapped as being potentially susceptible to liquefaction (Figure 7). However, based on our understanding of the proposed improvements and the fact that the project does not meet the requirements of a “project” per the Seismic Hazards Mapping Act an evaluation of the potential for liquefaction and liquefaction-related risks, including dynamic settlement and lateral spread were not included in our evaluation. In addition, due to the existence of shallow formational material it is our opinion that soil liquefaction is not a design consideration for this project.

11 CONCLUSIONS

Based on the results of our evaluation, it is our opinion that the proposed project and associated improvements for the San Pascual Treatment Wetland are feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the design and construction of the project. However, the following conditions may impact the design and constructability of the project:

Shallow Bedrock Impact to Stormwater Infiltration: The perched groundwater encountered at the contact between the younger alluvium and bedrock in borings B-1A, B-2A, and P-4A suggests that the site bedrock will significantly reduce the effectiveness of on-site stormwater infiltration. It is anticipated that the general fine-grained and dense nature of the bedrock will impede the downward infiltration of water. It is our opinion that the stormwater will infiltrate through the younger alluvial deposits and migrate laterally along the bedrock/alluvial contact.

Soft, Wet Materials in the Existing Wetland: Based on our subsurface exploration and site observations, the upper materials within the existing wetland area are anticipated to be very soft and saturated and may not support heavy earthmoving equipment. Mudcats, other light track equipment or specialized methods will be involved to work on the wetland bottom. Planned excavations and other earthwork within the existing wetland area should anticipate very soft, saturated soil conditions. Additional evaluation may be warranted to further evaluate the conditions of the wetland area after it has been drained and allowed to dry, such as test pits to observe and sample the existing soils for material type, moisture content, density, and organic content in order to provide appropriate remedial measures and evaluate whether the material can be reused as fill at the site.

Additional conclusions for the project, based on our geotechnical evaluation, are as follows:

- The subject site is generally underlain by undocumented fill over younger alluvial deposits consisting of moist, loose to very dense, poorly graded sand with silt, silty sand, and sandy silt with variable amounts of gravel, cobbles, and possible boulders. The fill materials are considered to be potentially compressible. The younger alluvial deposits are underlain by older alluvium consisting of interbedded hard clay and very dense silty sand with gravel, cobbles, and boulders and Topanga Formation bedrock of interbedded weakly to strongly cemented sandstone and weakly indurated siltstone and claystone.

- In general, excavations in the existing fill soil, young and old alluvium, and Topanga Formation bedrock should be feasible with earthmoving equipment in good working condition.

- We anticipate that the on-site excavated materials should be suitable for re-use as engineered fill and trench backfill provided, they are free of trash, debris, roots, contamination, deleterious materials, and cobbles or hard lumps of material in excess of 4

inches in diameter. Oversize and wet materials will be encountered during site excavations and should be anticipated by the contactor. Processing of the materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should be planned by the contractor.

- The on-site soils are generally granular and will be prone to caving during excavation. The on-site soils should be considered as Type C soils in accordance with United States Department of Labor Occupational Safety and Health Administration (OSHA) regulations. Accordingly, temporary excavations deeper than 4 feet in depth should be shored or laid back at inclinations of 1½ to 1 (horizontal to vertical) or flatter.

- Where excavations cannot be laid back, temporary shoring is anticipated. Shoring should be designed by the contractor to support the excavation sidewalls and to reduce the potential for settlement of adjacent structures, roadways and other site improvements. Shoring should be designed in accordance with OSHA regulations.

- Our percolation testing indicates that the younger alluvial deposits at the approximate invert depth of the infiltration facility have an adjusted percolation rate of 2.8 inches per hour. We recommend using this value for design of the project; however, this rate should be adjusted as needed in accordance with the 2021 LACDPW guidelines.

- Seepage was encountered in our exploratory borings along the contact between the underlaying younger alluvium and bedrock at depths of approximately 8½ to 10 feet and a groundwater surface was encountered at depths of approximately 20 to 25 feet. The historic high depth to groundwater is mapped as being approximately 20 feet (CDMG, 1998). Fluctuations in amount and depths of seepage, and the level of the groundwater surface, will occur due to variations in ground surface topography, subsurface stratification, rainfall, irrigation practices, groundwater pumping, the distance from the existing wetland, and other factors that were not evident at the time of our field evaluation.

- The site is located within a mapped Seismic Hazards Zone considered susceptible to liquefaction (CGS, 2022). However, due to the shallow depth to bedrock as well as the dense nature of alluvium soil liquefaction is not a design consideration for this project.

- The site is located within an EFZ and previous studies by others have mapped inferred fault spays across the site. with the potential for fault rupture as defined by the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 2018). The potential for surface fault rupture at the site is relatively high. Differenced in material types and bedrock depths encountered during our subsurface exploration suggest that a fault splay may be present between borings B-3A and B-4A.

- Based on the results of our laboratory testing (relatively dense and moist materials), hydro-collapse of the on-site alluvial soils resulting from on-site infiltration is not considered a design issue.

- The site is not located within a designated flood inundation zone from the 100-year flood event (FEMA, 2008).

- Based on our laboratory corrosion testing, the on-site soil can be classified as non-corrosive per the 2021 Caltrans Corrosion Guidelines.

12 RECOMMENDATIONS

The following sections present our geotechnical recommendations for design and construction of the project. This project is in preliminary design phase and some aspects of the design will be subject to change. Ninyo & Moore should review the final plans and develop additional

geotechnical recommendations as appropriate. These recommendations are based on our evaluation of the site geotechnical conditions, our understanding of the planned construction, and experience in the vicinity of the project. The work should be performed in conformance with the recommendations presented in this report, project specifications, and appropriate agency standards.

12.1 Earthwork

We anticipate that earthwork at the site will consist of cuts and fills associated with reconstruction of the treatment wetland, installation of associated structures (i.e., new drop structure, actuated valves, pump station, hydrodynamic separators, stormwater harvesting unit, and infiltration unit), preparation of subgrades for at-grade improvements, including new permeable pavement/pavers in the north parking lot area, and trenching and backfilling of underground utilities and pipelines. Based on our understanding of the project, we anticipate that excavations for the project will vary from approximately 2 to 15 feet in depth. Earthwork operations should be performed in accordance with the requirements of applicable governing agencies and the recommendations presented in the following sections.

12.1.1 Pre-Construction Conference

We recommend that grading and foundation plans be submitted to Ninyo & Moore for review to check for conformance to the recommendations provided in this report. We further recommend that a pre-construction conference be held to discuss the grading recommendations presented in this report. The owner and/or their representative, the governing agencies' representatives, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the work plan, project schedule, and earthwork requirements.

12.1.2 Clearing and Site Preparation

Prior to performing excavations or other earthwork, the site should be cleared of existing site improvements and foundations, gravel, debris, vegetation, and loose or otherwise unsuitable soils. Materials generated from the clearing/demolition operations should be removed from the project site and disposed of at a legal dump site. Existing utilities to remain in-place should be located and protected from damage by construction activities. Excavations resulting from the removal of foundations, underground utilities, and/or other underground improvements, should be backfilled with compacted fill in general accordance with the fill and compaction recommendations presented below.

12.1.3 Excavation Characteristics

We anticipate that excavations in the undocumented fill, younger and older alluvial deposits, and bedrock should be feasible with earthmoving equipment in good working order. The undocumented fill and young alluvial materials generally consisted of moist to wet, loose to very dense, poorly graded sand with silt and silty sand with varying amounts of gravel, cobbles, and possible boulders. The older alluvium generally consists of interbedded hard clay and very dense silty sand with gravel, cobbles, and boulders and the Topanga Formation bedrock consists of interbedded weakly to strongly cemented sandstone and weakly indurated siltstone and claystone. As discussed, very soft to soft, saturated soils are anticipated along the bottom of the existing wetland that may not be able to support heavy equipment. Mudcats or other light track-mounted equipment should be anticipated to work on the wetland bottom. Oversize material is not considered suitable for use as backfill. In the event that oversize material, including cobbles, boulders, and/or construction debris, is encountered during excavation operations, the oversized material should be disposed of off-site. Processing of the excavated materials to bring them near the laboratory optimum moisture content (i.e., drying and/or wetting) prior to use as fill should be planned by the contractor. Contractors should make their own independent evaluation of the excavatability of the on-site materials prior to submitting their bids, including allowances for processing the soils.

We anticipate that temporary excavations in wet soils will not be stable at inclinations steeper than approximately 3 to 1 (horizontal to vertical). Seepage should be anticipated from excavations in the wetland bottom sediments and in excavations that approach or exceed the depth of the younger alluvium and bedrock contact. Temporary excavations should be evaluated in the field at the time of construction by our representative.

12.1.4 Subgrade Preparation for the Treatment Wetland

Based on our exploratory borings, younger alluvial deposits are anticipated to be encountered at the bottom of the planned treatment wetland that should be suitable for its intended purpose. The excavation bottoms should be evaluated by our representative during the excavation work. In the event that unsuitable material is encountered along the bottom of the excavation, including undocumented fill, the unsuitable material should be removed and replaced with loosely packed clean sand or gravel, such as drainage rock. The actual recommendations for removal and replacement should be based on our field observations. We recommend that minimal compaction be performed on the exposed subgrade and materials used to replace unsuitable materials (if needed). Compaction of the subgrade could

potentially reduce the infiltration rate of the wetland. If the subgrade of the wetland is compacted, we recommend that additional percolation testing be performed. Side slopes for the new treatment wetland should be constructed at inclinations of approximately 3 to 1 (horizontal to vertical) or flatter. If new fills will be placed along the bottom or sides of the wetland, we recommend that the new fill materials be placed on relatively dense alluvial deposits and/or bedrock material. The areas to receive new fill should be observed by our representative during the excavation work. The upper approximately 8 inches of exposed bottom beneath areas to receive fill should be scarified, moisture-conditioned and recompacted to a relative compaction of 90 percent as evaluated by ASTM International (ASTM) D 1557

12.1.5 Treatment of Near-Surface Soils for Buried Structures

In order to provide suitable support and reduce the potential for settlement of proposed buried structures (i.e., the drop structure, pump station, hydro-dynamic separators, filtration unit, harvesting unit, valves, etc.), we recommend that the existing undocumented fill, upper loose alluvial deposits, and/or upper soft/loose bedrock should be removed and recompacted from beneath the footprints of these structures. The excavations should extend deep enough to provide 2 feet or more of newly compacted fill material beneath the proposed foundations. The overexcavation should expose relatively dense alluvial deposits and/or bedrock. Additional overexcavation of loose, soft, and/or wet areas may be appropriate. The excavation bottoms should be evaluated by our representative during the excavation work and additional recommendations, if needed, be based on field observations. The limits of removal should extend approximately 5 feet beyond the footprint of the foundations for the buried structures or a distance equal to the depth of the overexcavations beneath the foundations, whichever is farther. If drainage rock is placed beneath the foundations for the buried structures, the rock can be considered part of the 2-foot-thick layer of compacted fill beneath the foundations. Prior to placing compacted fill and/or drainage rock, the upper approximately 8 inches of the exposed bottom should be scarified, moisture-conditioned to near optimum moisture content, and recompacted to a relative compaction of 90 percent as evaluated by ASTM D 1557.

12.1.6 Treatment of Near-Surface Soils for Parking Lot

In order to provide suitable support and reduce the potential for settlement of new pavements subject to vehicular traffic (i.e., the permeable paver parking lot at the north end of the site), we recommend that the subgrade beneath the pavement section be overexcavated and recompacted to a depth of approximately 2 feet beneath the existing ground surface or a depth that provides approximately 2 feet of compacted fill beneath the pavement section,

whichever is deeper. The limits of the excavations should extend laterally so that the bottoms of the excavations are approximately 2 feet beyond the outside edges of the pavement, or a distance equal to the depth of the overexcavation, whichever is farther. In general, the overexcavations should remove existing undocumented fill and loose alluvial deposits. Accordingly, we recommend that the excavation bottoms expose relatively dense granular alluvial deposits. The excavation bottoms should be evaluated by our representative during the excavation work. Additional overexcavation of loose, soft, clayey, and/or wet areas may be appropriate depending on our observations during construction. The excavation bottom should be scarified to a depth of approximately 8 inches, moisture-conditioned, and compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557 prior to the placement of fill.

12.1.7 Treatment of Near-Surface Soils for Hardscape

In order to provide suitable support and reduce the potential for settlement of new hardscape (i.e., sidewalks, curbs and gutters, etc.), we recommend that the upper approximately 12 inches of material beneath the existing ground surface be removed and recompacted from beneath the improvements or a depth that provides approximately 1 feet of compacted fill beneath the improvements, whichever is deeper. The limits of the excavations should extend laterally so that the bottoms of the excavations are approximately 1 foot beyond the outside edges of the hardscape, or a distance equal to the depth of the overexcavation, whichever is farther. In general, the overexcavations should expose relatively dense undocumented fill or alluvial deposits. The excavation bottoms should be evaluated by our representative during the excavation work. Additional overexcavation of loose, soft, and/or wet areas may be appropriate depending on our observations during construction. The excavation bottom should be scarified to a depth of approximately 8 inches, moisture-conditioned, and compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557 prior to the placement of fill.

12.1.8 Temporary Excavations

We recommend that excavations be designed and constructed in accordance with OSHA regulations. These regulations provide shoring design parameters for excavations and trenches up to 20 feet deep based on the soil types encountered. Trenches over 20 feet deep should be designed by the contractor's engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that the undocumented fill and alluvial soils be considered as OSHA Type C soil and the bedrock be considered as OSHA Type B soil.

For trench or other excavations, OSHA requirements regarding personnel safety should be met by using appropriate shoring or by laying back the slopes no steeper than 1½:1 (horizontal to vertical) for Type C soils and 1:1 (horizontal to vertical) for Type B soils. Temporary excavations that encounter seepage may need shoring or may be mitigated by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. On-site safety of personnel is the responsibility of the contractor.

Care should be taken by the contractor to avoid undermining adjacent existing foundations and improvements. New excavations should not extend within the "zone of influence" of existing foundations, if present, which is defined as a 1:1 (horizontal to vertical) plane projecting out from the bottom outside edge of the foundations. In the event that excavations will extend within the "zone of influence" of existing foundations, our office should be notified, and appropriate recommendations provided, such as temporary underpinning of impacted foundations and/or temporary shoring.

12.1.9 Shoring

Where temporary slopes are not possible, shoring will be appropriate. The design of the shoring system should consider the excavation characteristics of the onsite soil, temporary excavation stability, and the impact of construction on existing structures.

Shoring systems will be constructed through fill, alluvial deposits, and bedrock. We anticipate that braced driven sheet pile shoring systems will be appropriate for the project to depths up to approximately 30 feet. Cantilevered shoring systems (if used) should be limited to heights of up to 10 feet. Braced and cantilevered shoring systems should be designed using the lateral earth pressure values presented on Figures 8 and 9, respectively. The recommended design pressures are based on the assumptions that the shoring system is constructed without raising the ground surface elevation behind the shoring wall, that there are no surcharge loads, such as soil stockpiles and construction materials, and that no loads act above a 1:1 (horizontal to vertical) plane extending up and back from the base of the shoring system. For shoring walls subjected to the above-mentioned surcharge loads, the contractor should include the effect of these loads on the lateral pressures against the shoring system. The shoring systems planned for the project should be reviewed by our office to evaluate the design considerations and geotechnical parameters used. Ground settlement may occur behind the shoring system wall during excavation. The amount of settlement depends on the type of shoring system, the contractor's workmanship, and soil conditions. We recommend that structures/improvements in the vicinity of the planned shoring installation be reviewed

with regard to foundation support and tolerance to settlement. To reduce the potential for distress to adjacent structures, we recommend that the shoring system be designed to limit the ground settlement behind the shoring system to ½ inch or less, which would equal approximately ½ inch of deflection. Potential causes of settlement that should be addressed include settlement during installation of the shoring, excavation for structure construction, construction vibrations, and removal of the support system. The vibrations from the driving of sheet piles, if used, may result in some dynamic settlement of granular soils that may affect the adjacent structures. We recommend that shoring installation be evaluated carefully by the contractor prior to construction and that ground vibration and settlement monitoring be performed during construction. Vibration and settlement monitoring should be performed during sheet pile driving, if used. If settlement is detected or peak particle velocities of approximately 0.4 inch per second or more are measured adjacent to existing improvements, the sheet pile driving should be stopped and evaluated. The evaluation may include changing the hammer vibration frequency and monitoring for settlement and vibrations. To reduce the potential for settlement associated with sheet pile removal, sheet piles may be left in place. In the event excessive settlement or other damage occurs associated with the pile driving operations, it may be appropriate to perform grouting beneath nearby structure(s) to mitigate the pile driving effects. We recommend that shoring installation be evaluated carefully by the contractor prior to construction.

The contractor should retain a licensed, qualified and experienced engineer to design the shoring system. The shoring parameters presented in this report are minimum requirements, and the contractor should evaluate the adequacy of these parameters and make the modifications as needed for their design. We recommend that the contractor take appropriate measures to protect workers. OSHA requirements pertaining to worker safety should be observed.

12.1.10 Fill Material

In general, the on-site soils should be suitable for reuse as fill materials, provided they are free of trash, debris, oversize material, organic material, or other deleterious materials. Fill should generally be free of rocks or lumps of material in excess of 4 inches in diameter. Rocks or hard lumps larger than approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site.

Fill used as backfill buried structures should consist of free-draining, granular, non-expansive soil that conforms with the latest edition of Greenbook for structure backfill. “Non-expansive”

can be defined as soil having an EI of 20 or less in accordance with ASTM Test Method D 4829 (CBC, 2019). The on-site granular soils are anticipated to meet this requirement.

Imported fill material should consist of clean, non-expansive, granular material which also conforms to the latest addition of Greenbook for structure backfill. The soil should also be tested for corrosive properties prior to importing. We recommend that the imported materials meet the 2021 Caltrans criteria for non-corrosive soils (i.e., soils having a chloride concentration of 500 parts per million [ppm] or less, a soluble sulfate content of approximately 0.15 percent (1,500 ppm) or less, a pH value of 5.5 or higher, or an electrical resistivity of 1,500 ohm-centimeters or more). Materials for use as fill should be evaluated by Ninyo & Moore prior to importing. The contractor should be responsible for the uniformity of import material brought to the site.

12.1.11 Fill Placement and Compaction

In general, fill material, including structure and trench backfill, fill placed beneath foundations and pavements, should be moisture-conditioned and compacted in horizontal lifts to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Fill material with less than 15 percent fines (passing No. 200 sieve) should be compacted to 95 percent relative compaction as evaluated by ASTM D 1557. Fill material should be moisture-conditioned to slightly above the laboratory optimum moisture content. The lift thickness for fill soils will depend on the type of compaction equipment used but generally should not exceed 8 inches in loose thickness. Special care should be exercised to avoid damaging pipes during compaction of trench backfill. Placement and compaction of the fill soils should be in general accordance with local grading ordinances and good construction practice.

12.2 Underground Utilities

We anticipate that underground pipelines will be supported on native alluvial deposits. Based on the preliminary plans, pipeline inverts may be up to approximately 15 feet in depth.

12.2.1 Pipe Bedding

We recommend that pipes be supported on 6 inches or more of granular bedding material, such as sand, with a sand equivalent value of 30 or more. Bedding material should be placed around the pipe and 12 inches or more above the top of the pipe in accordance with the current Greenbook. Special care should be taken not to allow voids beneath the pipe. Compaction of the bedding material and backfill should proceed up both sides of the pipe.

Trench backfill, including bedding material, should be placed in accordance with the recommendations presented in the Earthwork section of this report.

12.2.2 Trench Backfill

Based on our subsurface evaluation, the on-site soils should generally be suitable for re-use as trench backfill provided, they are free of organic material, clay lumps, debris, and rocks more than approximately 4 inches in diameter. We recommend that trench backfilling be in general conformance with the Greenbook standard specifications for structure backfill. Fill should be moisture-conditioned to at or slightly above the laboratory optimum. Wet soils should be allowed to dry to a moisture content near the optimum prior to their placement as trench backfill. Trench backfill should be compacted to a relative compaction of 90 percent or more as evaluated by ASTM D 1557. Lift thickness for trench backfill will depend on the type of compaction equipment utilized but should generally be placed in horizontal lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipelines during compaction of the backfill.

12.2.3 Modulus of Soil Reaction for Pipe Design

The modulus of soil reaction is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines for the purpose of evaluating deflection caused by the weight of the backfill above the pipe. We recommend that a modulus of soil reaction of 1,000 pounds per square inch be used for design, provided that granular bedding material is placed adjacent to the pipe, as recommended in the previous section.

12.3 Site-Specific Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the site-specific spectral response acceleration parameters in accordance with the CBC (2019) guidelines.

Table 2 – 2019 California Building Code Seismic Design Criteria

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	C
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	2.108g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.737g
Site-modified Spectral Response Acceleration at 0.2-second Period, S_{MS}	2.529g
Site-modified Spectral Response Acceleration at 1.0-second Period, S_{M1}	1.031g
Site Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.686g
Site Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.687g
Site- modified Peak Ground Acceleration, PGA_M	1.1g

12.4 Mat Foundations

Our evaluation indicated that proposed structures (i.e., drop structure, hydrodynamic separators, pump station, valves, filtration unit, etc.) may be supported by mat foundations. The mat foundations should be supported on compacted fill in accordance with the recommendations presented in the Earthwork section of this report and should be designed in accordance with structural considerations and the following recommendations. In addition, requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures.

The mat foundations may be designed using a net allowable bearing capacity of 4,000 psf. The total and differential settlement corresponding to this allowable bearing load are estimated to be less than approximately 1 inch and ½ inch over a horizontal span of 40 feet, respectively.

Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils directly underlying the mat. A design modulus of subgrade reaction (K) of 50 tons per cubic foot may be used for the subgrade soils in evaluating such deflections.

12.5 Lateral Earth Pressures for Underground Structures

Walls for below-grade structures when constructed as recommended above may be designed for lateral pressures represented by the pressure diagram on Figure 10. To reduce the potential for pipe-to-wall differential settlement, which could cause pipe shearing, we recommend that a flexible pipe joint be located close to the exterior of the wall. The type of joint should be such that minor relative movement can be accommodated without distress. The pipe connections should be sufficiently flexible to withstand differential settlement of approximately ¾ inch.

12.6 Exterior Flatwork

We recommend that new exterior concrete sidewalks and flatwork (hardscape) have a thickness of 4 inches and be reinforced with No. 3 steel reinforcing bars placed 24 inches on-center (each way) near the mid-height of the slab. The hardscape should be underlain by 4 inches of clean sand and installed with crack-control joints at an appropriate spacing as designed by the structural engineer to reduce the potential for shrinkage cracking. Positive drainage should be established and maintained adjacent to flatwork. To reduce the potential for differential offset, joints between the new hardscape and adjacent curbs, existing hardscape, building walls, and/or other structures, and between sections of new hardscape, should be doweled.

12.7 Permeable Pavers

We understand that a new parking lot with permeable pavers will be constructed at the north end of the site. We recommend that the new pavers be underlain by newly compacted fill as discussed above in the Earthwork section. The new fill material should consist of granular deposits compacted to a relative compaction of 90 percent or more as evaluated by ASTM D 1557, or as recommended by the paver manufacturer. The pavers, including base/subbase materials, should conform to the compaction and material requirements of the manufacturer.

12.8 Corrosivity

Laboratory testing was performed on a representative soil sample collected from boring P-2A (sample depth of approximately 0 to 5 feet) to evaluate soil pH, electrical resistivity, water-soluble chloride content, and water-soluble sulfate content. The soil pH and electrical resistivity tests were performed in general accordance with CT 643. Chloride content tests were performed in general accordance with CT 422. Sulfate testing was performed in general accordance with CT 417. The soil pH of the sample tested was measured to be 5.8 and the electrical resistivity was measured to be 6,950 ohm-centimeters. The chloride content of the sample was measured to be 85 ppm. The sulfate content of the sample was measured to be 0.001 percent by weight (i.e., 10 ppm). Based on the laboratory test results and 2021 Caltrans corrosion criteria, the soils at the project site can be classified as non-corrosive, which is defined as having earth materials with less than 500 ppm chlorides, less than 0.15 percent sulfates (i.e., 1,500 ppm), a pH of 5.5 or more, or an electrical resistivity of 1,500 ohm-cm or more. The corrosivity test results are presented in Appendix B.

12.9 Concrete Placement

Concrete in contact with soil or water that contains high concentrations of water-soluble sulfates can be subject to premature chemical and/or physical deterioration. Based on the CBC (2019), the potential for sulfate attack is negligible for water-soluble sulfate contents in soil ranging from 0.00 to 0.10 percent by weight, moderate for water-soluble sulfate contents ranging from 0.10 to 0.20 percent by weight, severe for water-soluble sulfate contents ranging from 0.20 to 2.00 percent by weight, and very severe for water-soluble sulfate contents over 2.00 percent by weight. The soil sample tested for this evaluation, using CT 417, had a water-soluble sulfate content of approximately 0.001 percent by weight (i.e., 10 ppm). Accordingly, the on-site soils are considered to have a negligible potential for sulfate attack. Per ACI (2019b), Type II cement is appropriate for the site improvements. However, due to the potential variability of the soils on site, consideration should be given to using Type II/V cement for the project.

To reduce the potential for shrinkage cracks in the concrete during curing, we recommend that the concrete for the proposed improvements be placed with a slump of 4 inches based on ASTM C 143. The slump should be checked periodically at the site prior to concrete placement. We further recommend that concrete cover over reinforcing steel for foundations be provided in accordance with CBC (2019). The structural engineer should be consulted for additional concrete specifications.

12.10 Stormwater Infiltration Wetland and Reservoir

Based on our subsurface evaluation, the site is generally underlain by undocumented fill and alluvial deposits consisting of poorly graded sand with silt and silty sand with variable amounts of gravel, cobbles, and possible boulders. We recommend that an infiltration rate of 2.8 inches per hour, following adjustments by the BMP designer for RF_s, be used for the site alluvial soils. As previously discussed, we anticipate that stormwater will mound/perch on top of the bedrock encountered at depths of approximately 9 to 14 feet across the majority of the site (29 feet at the southernmost end at boring B-3A). It is anticipated that infiltrated stormwater will move laterally along this contact. We recommend that the bottoms of the wetland be further evaluated during construction. Additional recommendations may be provided at that time if fine-grained materials are present within the alluvial deposits exposed at the bottom of the wetland, such as removing the fine-grained material and replacing it with granular material.

Based on our evaluation, the potential for hydro-collapse settlement associated with infiltration is generally low due to the proposed depth of infiltration. However, we generally recommend a setback of 15 feet or more between settlement sensitive

structures and proposed infiltration areas.

12.11 Drainage

Proper surface drainage is imperative for satisfactory site performance. Positive drainage should be provided and maintained to direct surface water away from existing foundations. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet or more away from foundations and tops of slopes. Runoff should then be directed by the use of swales or pipes into a collective drainage system. Area drains for landscaped and paved areas are recommended. Surface waters should not be allowed to pond adjacent to footings. We recommend that above-ground structures, if constructed, have roof drains and downspouts installed to collect runoff.

12.12 Landscaping

Project landscaping should consist of drought tolerant plants. Landscape irrigation should be kept to a level just sufficient to maintain plant vigor. Overwatering should not be permitted.

13 CONSTRUCTION OBSERVATION

The recommendations provided in this report are based on our understanding of the proposed project and our evaluation of the data collected based on subsurface conditions disclosed by widely spaced exploratory borings. It is imperative that the geotechnical consultant checks the interpolated subsurface conditions during construction. We recommend that Ninyo & Moore review the project plans and specifications prior to construction. It should be noted that, upon review of these documents, some recommendations presented in this report may be revised or modified.

During construction we recommend that the duties of the geotechnical consultant include, but not be limited to:

- Observing site clearing, grubbing, and removals.
- Observing excavation bottoms, including the bottom of the proposed wetland.
- Observing preparation of pavement and foundation subgrades.
- Observing placement and compaction of fill, including trench and structure backfill.
- Evaluating imported materials prior to their use as fill (if used).
- Performing field tests to evaluate fill compaction.
- Observing foundation excavations for bearing materials and cleaning prior to placement of reinforcing steel or concrete.
- Performing material testing services including concrete compressive strength and steel tensile strength tests and inspections.

The recommendations provided in this report assume that Ninyo & Moore will be retained as the geotechnical consultant during the construction phase of this project. If another geotechnical consultant is selected, we request that the selected consultant indicate to the owner and to our firm in writing that our recommendations are understood and that they are in full agreement with our recommendations.

14 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analysis presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care

exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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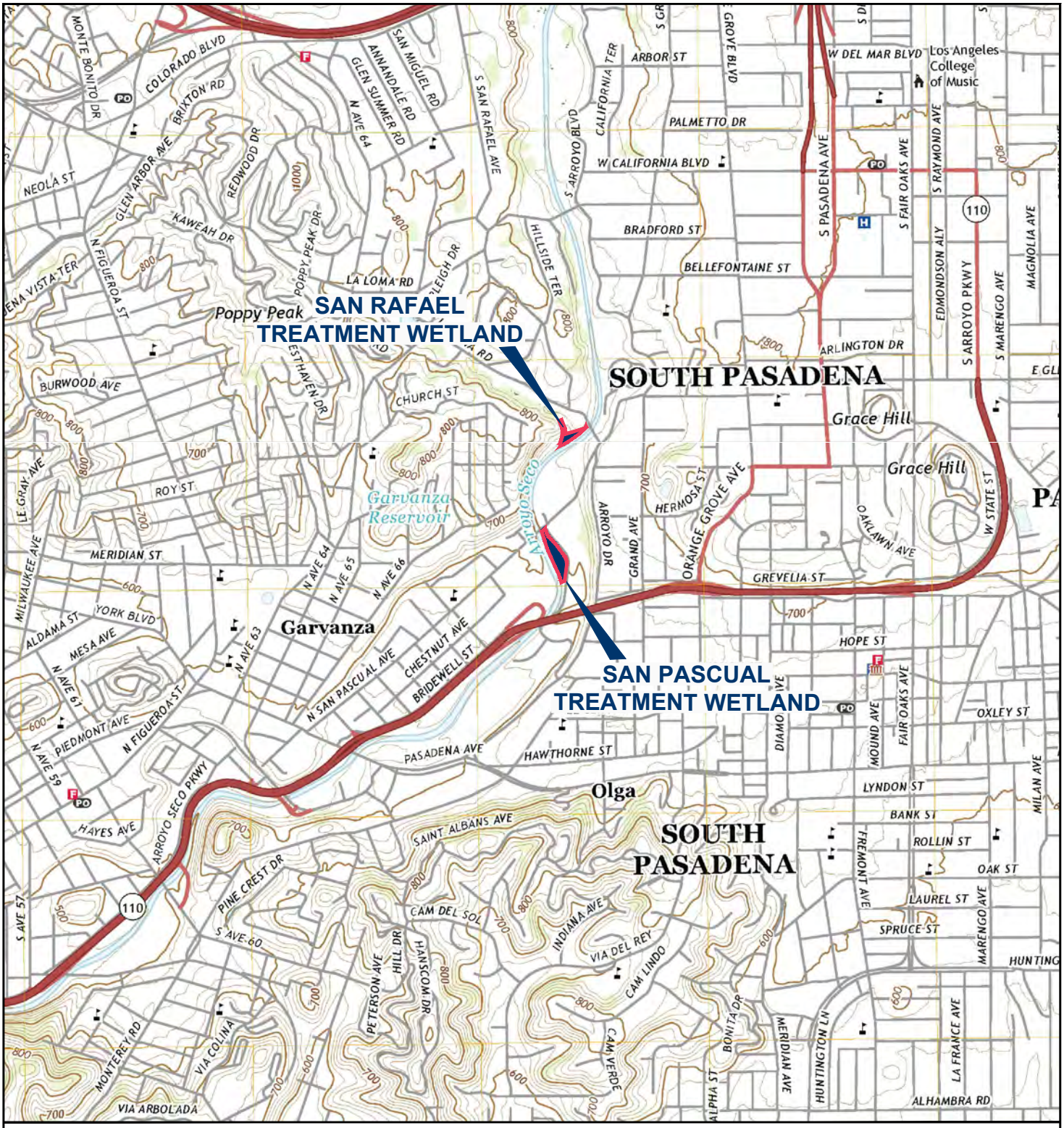
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FIGURES



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: USGS, 2022.

1_211880001_SL.dwg (San Pascual) 06/14/2022 JDP, GK

FIGURE 1

SITE LOCATION

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

211880001 I 6/22

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

B-3A TD=31.5 — BORING; TD=TOTAL DEPTH IN FEET

P-4A TD=10.1 — PERCOLATION TEST; TD=TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: GOOGLE EARTH, 2022.

FEET
0 100 200

FIGURE 2

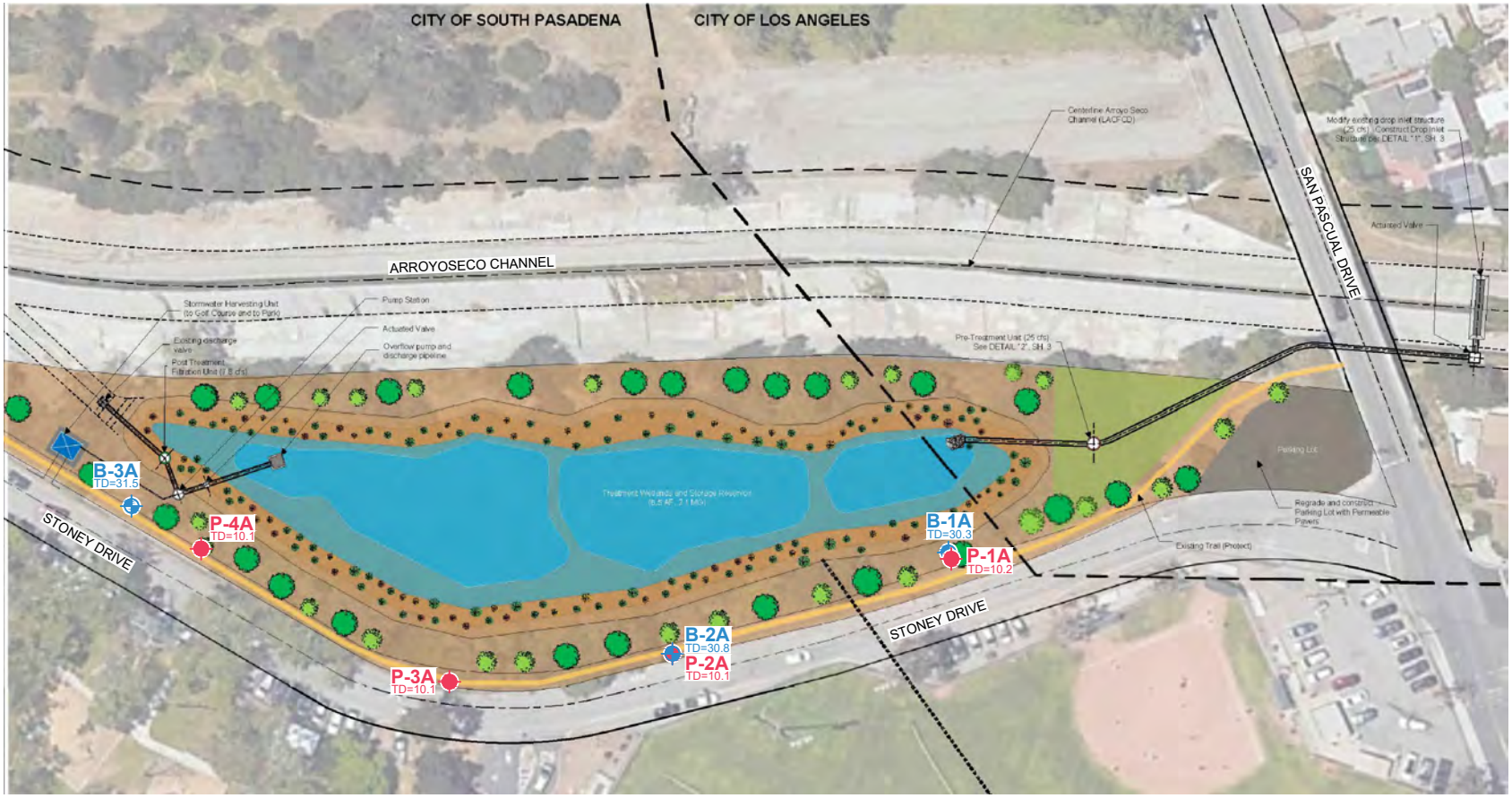
SITE AERIAL PHOTOGRAPH

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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2_211880001_SAP.dwg (San Pascual) 06/15/2022 JDP, GK



LEGEND

B-3A TD=31.5 — BORING; TD=TOTAL DEPTH IN FEET

P-4A TD=10.1 — PERCOLATION TEST; TD=TOTAL DEPTH IN FEET

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: GOOGLE EARTH, 2022; CRAFTWATER ENGINEERING, INC., 2020.

FEET
0 100 200

FIGURE 3

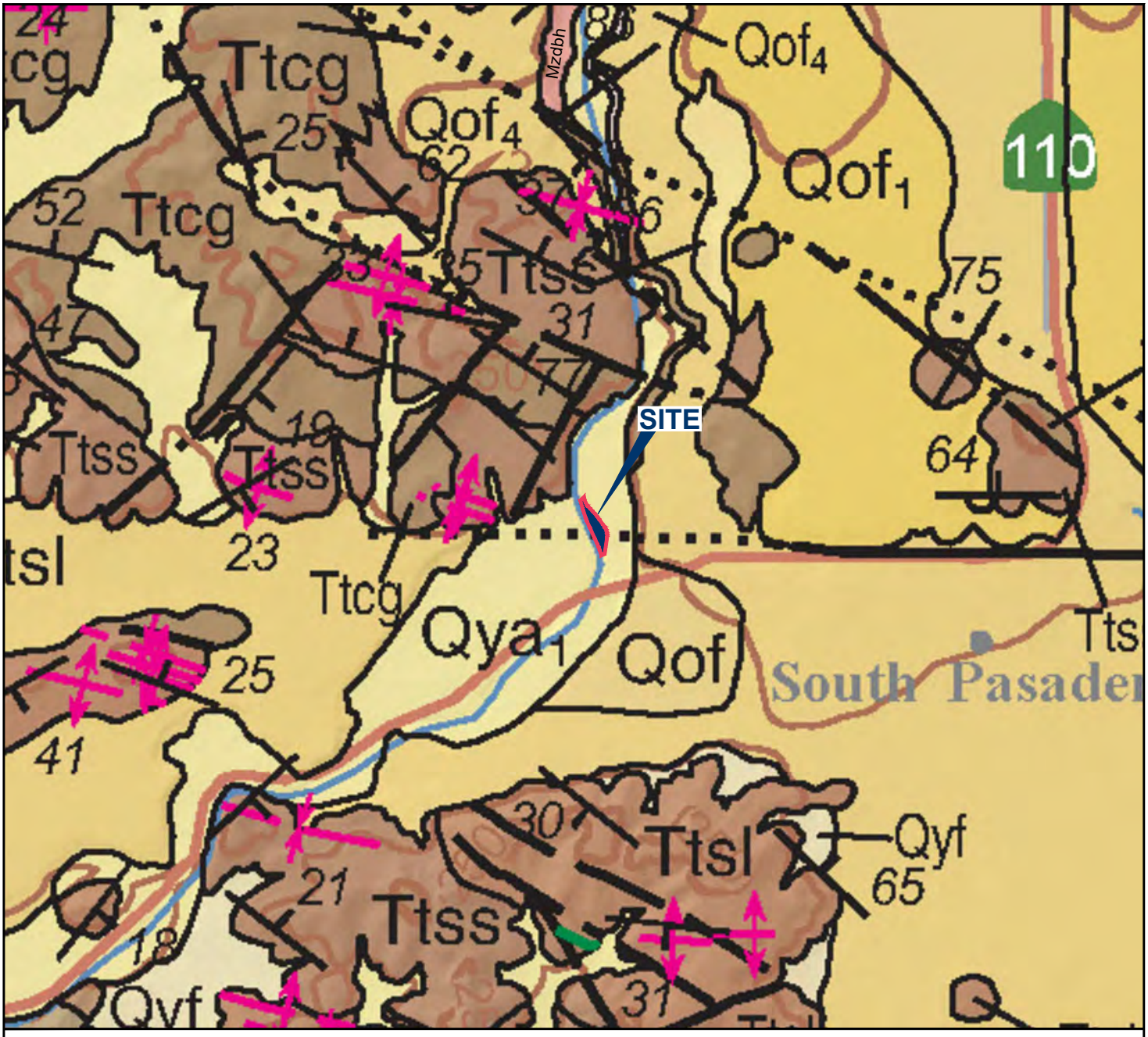
SITE PLAN

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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3_211880001_SP.dwg (San Pascual) 06/08/2022 JDP, GK



LEGEND

Qya	YOUNG ALLUVIUM	Ttcg	TOPANGA GROUP - CONGLOMERATE
Qyf	YOUNG ALLUVIAL FAN DEPOSITS	Mzdbh	BIOTITE - HORNBLENDE DIORITE
Qof	OLD ALLUVIAL FAN DEPOSITS		GEOLOGIC CONTACT
Ttss	TOPANGA GROUP - SANDSTONE		FAULT; DASHED WHERE INFERRED; DOTTED WHERE CONCEALED
Ttsl	TOPANGA GROUP - SILTSTONE		SYNCLINE; DASHED WHERE INFERRED
			ANTICLINE; DASHED WHERE INFERRED

N

FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CAMPBELL, R.H., ET AL., 2014.

4_211880001_RG.dwg (San Pascual) 06/08/2022 JDP

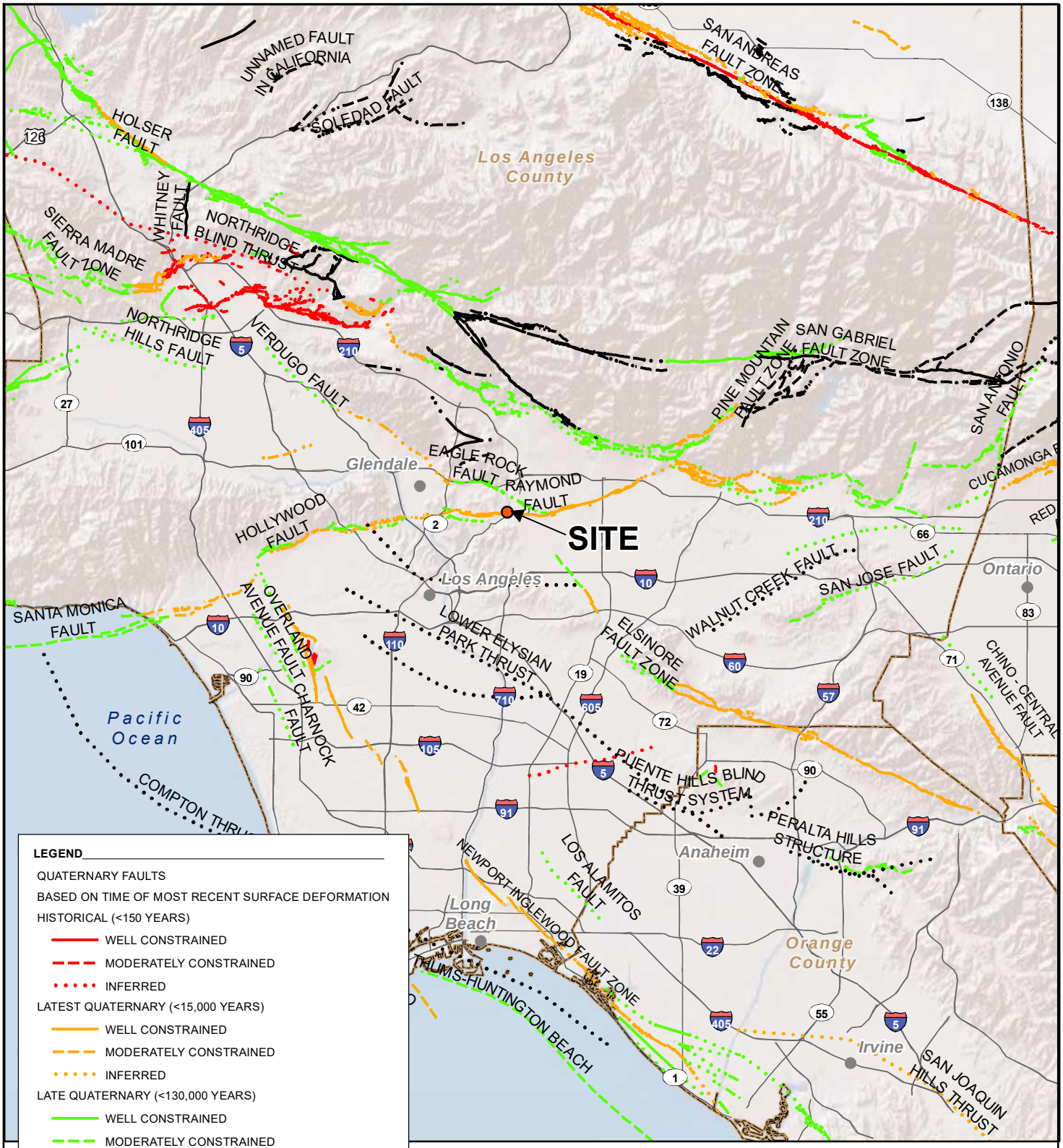
FIGURE 4

REGIONAL GEOLOGY

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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LEGEND

QUATERNARY FAULTS

BASED ON TIME OF MOST RECENT SURFACE DEFORMATION

HISTORICAL (<150 YEARS)
- WELL CONSTRAINED
- MODERATELY CONSTRAINED
- INFERRED

LATEST QUATERNARY (<15,000 YEARS)
- WELL CONSTRAINED
- MODERATELY CONSTRAINED
- INFERRED

LATE QUATERNARY (<130,000 YEARS)
- WELL CONSTRAINED
- MODERATELY CONSTRAINED
- INFERRED

UNDIFFERENTIATED QUATERNARY(<1.6 MILLION YEARS)
- WELL CONSTRAINED
- MODERATELY CONSTRAINED
- INFERRED

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

SOURCES: CALIFORNIA GEOLOGICAL SURVEY, ACCESSED MAY 31, 2022, AT: https://www.usgs.gov/natural-hazards/earthquake-hazards/faults; ESRI, 2021.

N

MILES 0 8 16

211880001-San Pascual_FL.mxd 5/31/2022 JDP

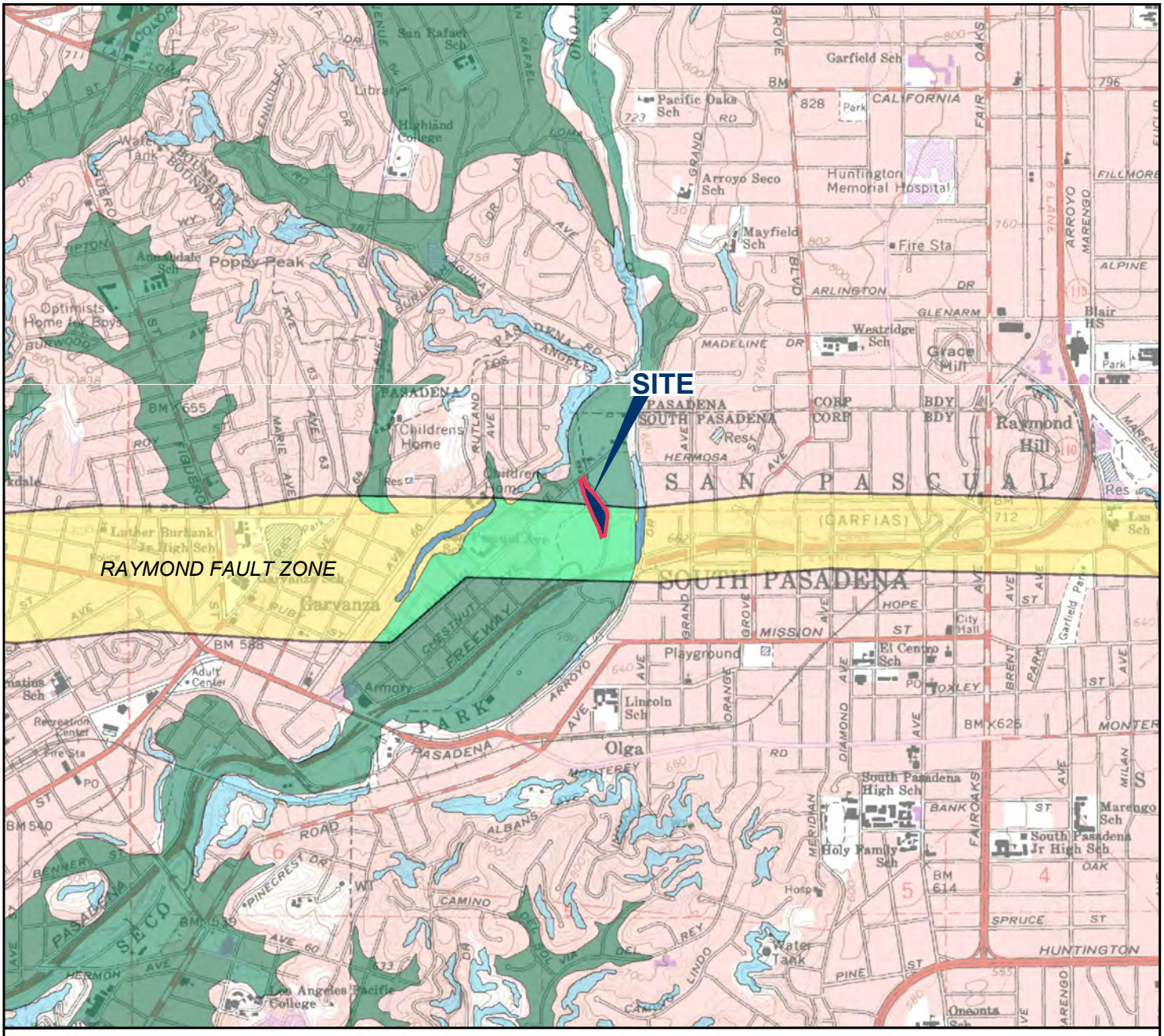
FIGURE 5

FAULT LOCATIONS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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LEGEND

EARTHQUAKE-INDUCED LANDSLIDES
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

LIQUEFACTION
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

EARTHQUAKE FAULT ZONES
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Induced Landslide Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

N

FEET
0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: CGS, 1999, REVISED 2017.

FIGURE 6

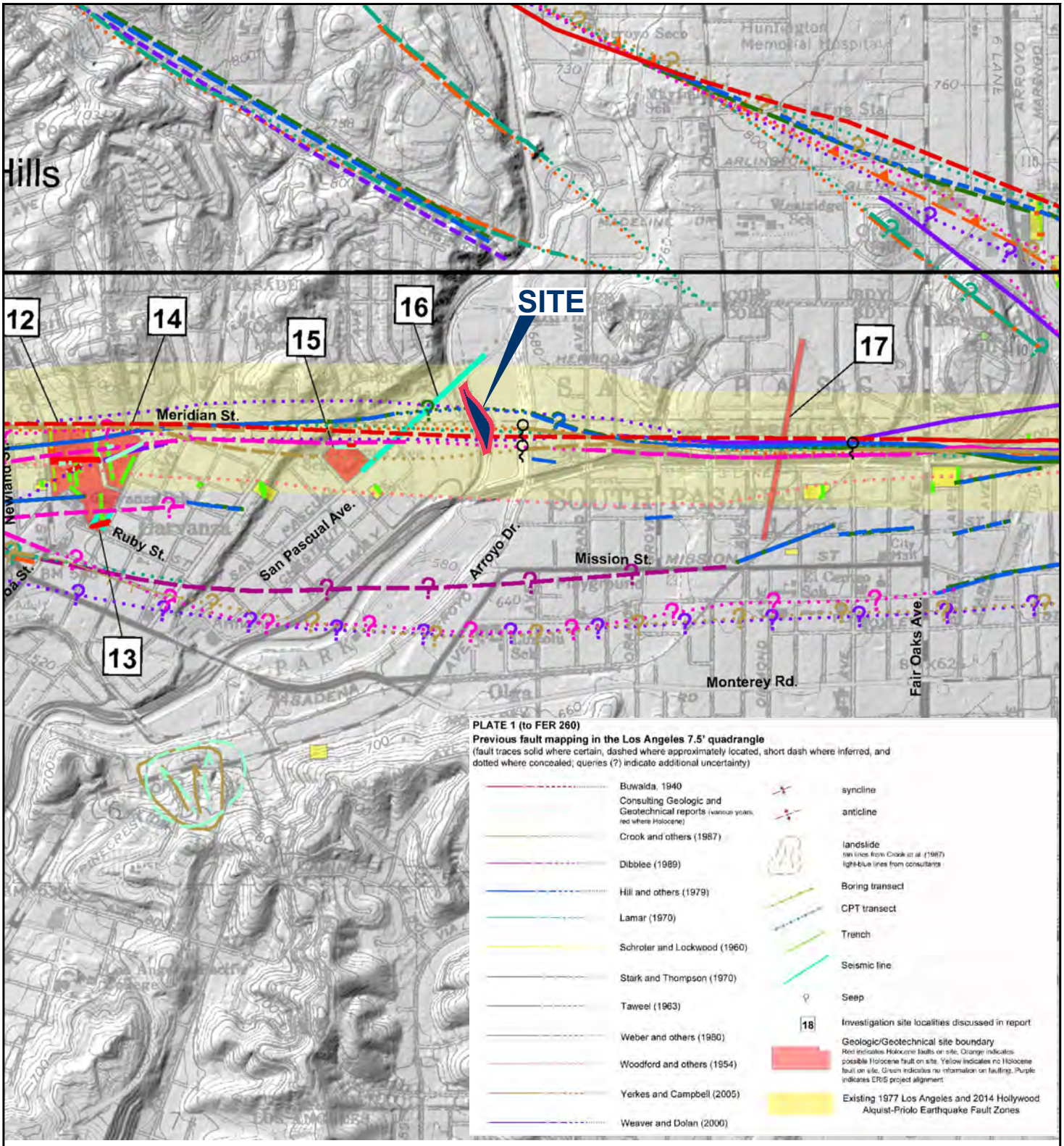
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SEISMIC HAZARD ZONES

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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6_211880001_SHZ.dwg (San Pascual) 06/08/2022 JDP



7_211880001_RFZ.dwg (San Pascual) 06/08/2022 JDP

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE. I REFERENCE: USGS, 2022.

N

FEET

0 1,600 3,200

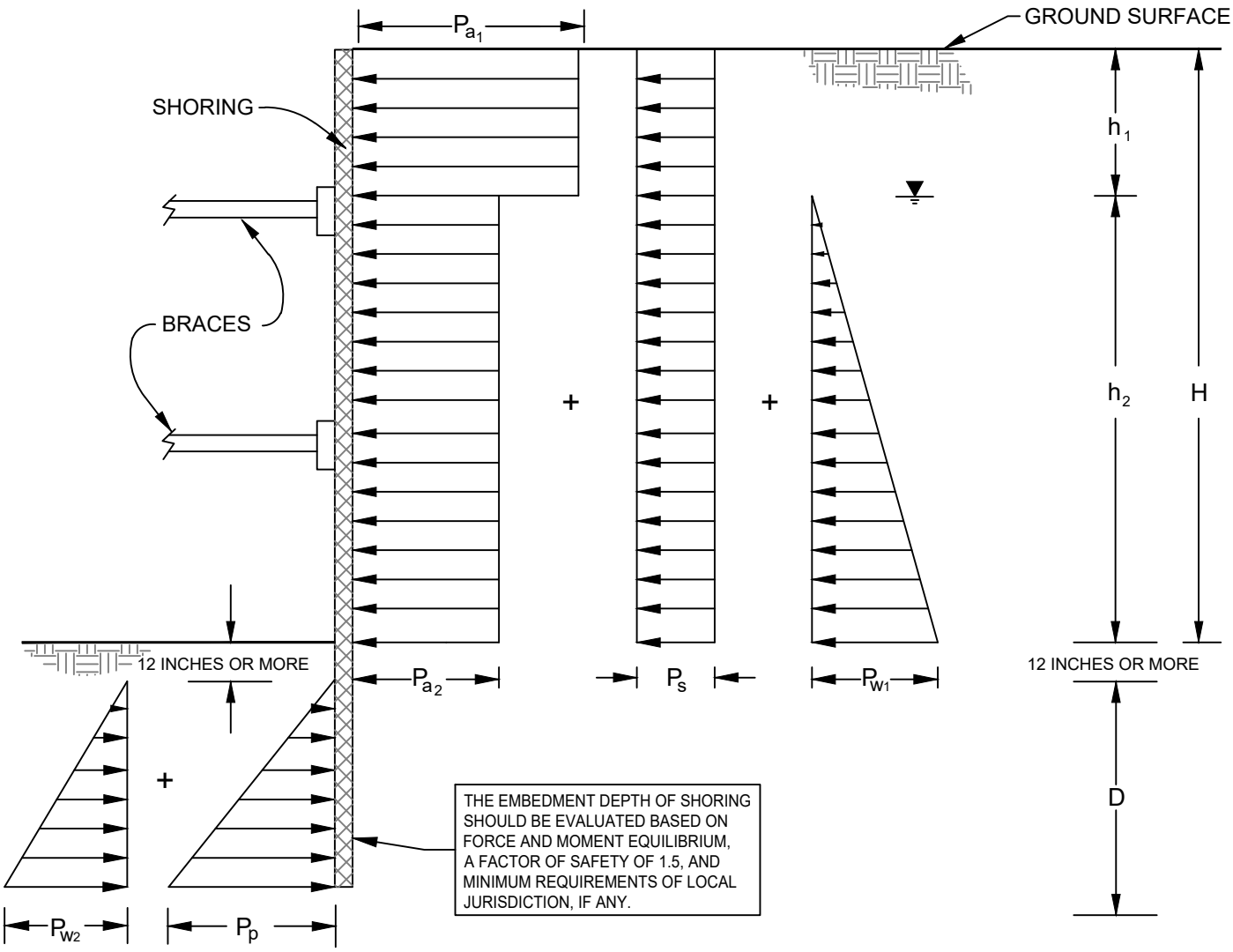
FIGURE 7

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RAYMOND FAULT ZONE

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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NOTES:

1. APPARENT LATERAL EARTH PRESSURES, P_{a1} AND P_{a2}
   $P_{a_1} = 25h_1$ psf
   $P_{a_2} = 12h_2$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   $P_s = 120$ psf
3. HYDROSTATIC PRESSURE, P_{w1} & P_{w2}
   $P_{w1} = 62.4(H - h)$ psf
   $P_{w2} = 62.4D$ psf
4. PASSIVE PRESSURE, P_p
   $P_p = 200D$ psf
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H, h_1, h_2 AND D ARE IN FEET
7. ▽ GROUNDWATER TABLE
8. P_{w2} IS APPLICABLE WHEN DEWATERING IS TO BE PERFORMED FROM INSIDE OR OUTSIDE OF THE EXCAVATION

NOT TO SCALE

8_211880001_LEP-BEBG(GS).dwg (San Pascual) 06/08/2022 JDP, GK

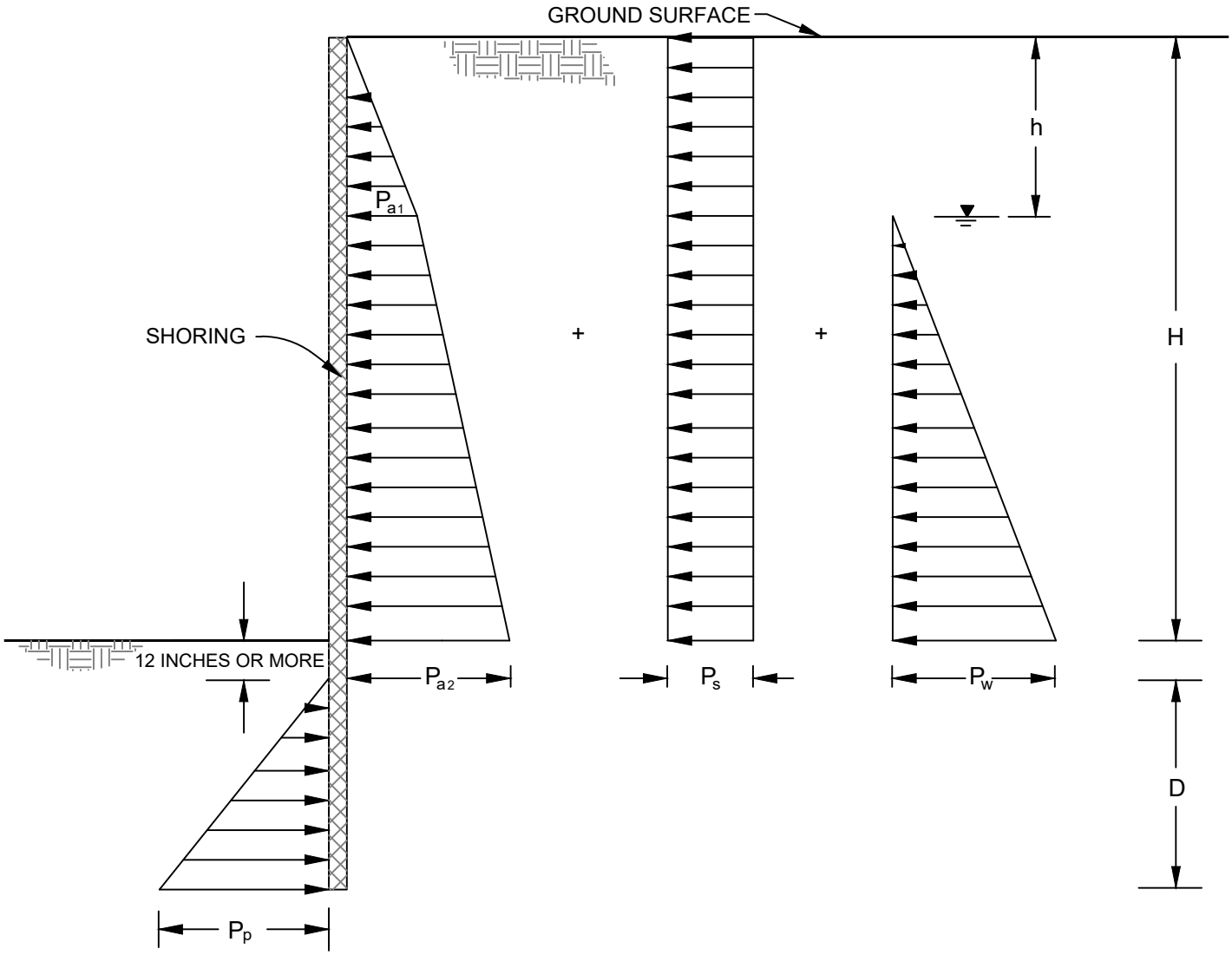
FIGURE 8

LATERAL EARTH PRESSURES FOR BRACED EXCAVATION

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

211880001 I 6/22



NOTES:

1. ACTIVE LATERAL EARTH PRESSURE, P_a
   $P_{a1} = 37h$ psf; $P_{a2} = P_{a1} + 18(H - h)$ psf
2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, P_s
   $P_s = 72$ psf
3. HYDROSTATIC PRESSURE, P_w
   $P_w = 62.4(H - h)$ psf
4. PASSIVE LATERAL EARTH PRESSURE, P_p
   $P_p = 200D$ psf
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H, h AND D ARE IN FEET
7. ▽ GROUNDWATER TABLE

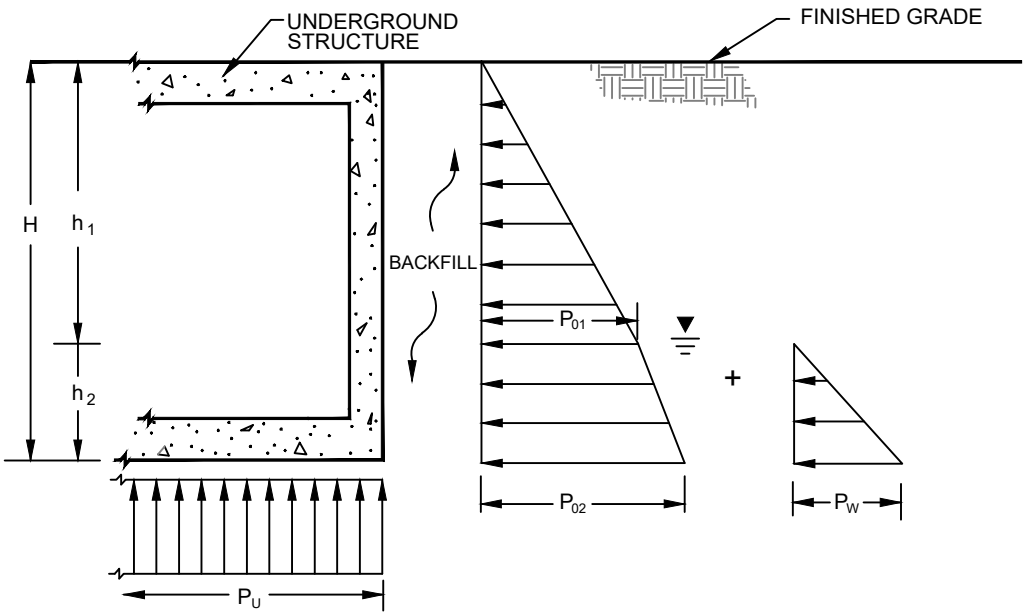
NOT TO SCALE

9_211880001_LEP-CSBG.dwg (San Pascual) 06/08/2022 JDP, GK

FIGURE 9

LATERAL EARTH PRESSURES FOR TEMPORARY CANTILEVERED SHORING

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA



NOTES:

1. APPARENT LATERAL EARTH PRESSURES, P_{01} AND P_{02}
   $P_{01} = 57h_1$ psf
   $P_{02} = 57h_1 + 28h_2$ psf
2. HYDROSTATIC PRESSURE, P_w
   $P_w = 62.4h_2$ psf
3. UPLIFT PRESSURE, P_u
   $P_u = 62.4h_2$ psf
4. SURCHARGE PRESSURES CAUSED BY VEHICLES OR NEARBY STRUCTURES ARE NOT INCLUDED
5. H, h_1 AND h_2 ARE IN FEET
6. ▼ GROUNDWATER TABLE

NOT TO SCALE

FIGURE 10

LATERAL EARTH PRESSURES FOR UNDERGROUND STRUCTURES

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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APPENDIX A

Boring Logs

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following method.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of $1^3/_8$ inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer falling freely from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler

The sampler, with an external diameter of 3 inches, was lined with 1-inch-long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

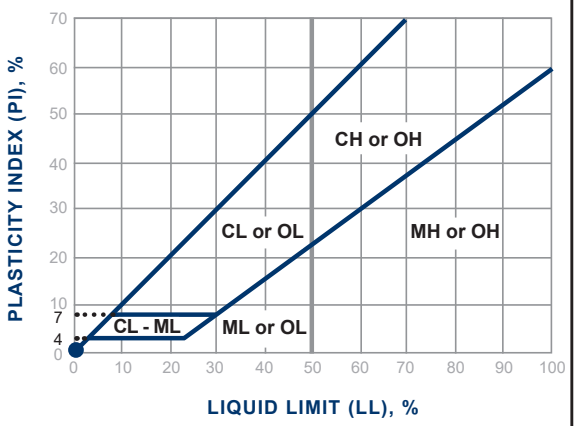
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions	
			Group Symbol	Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 4 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

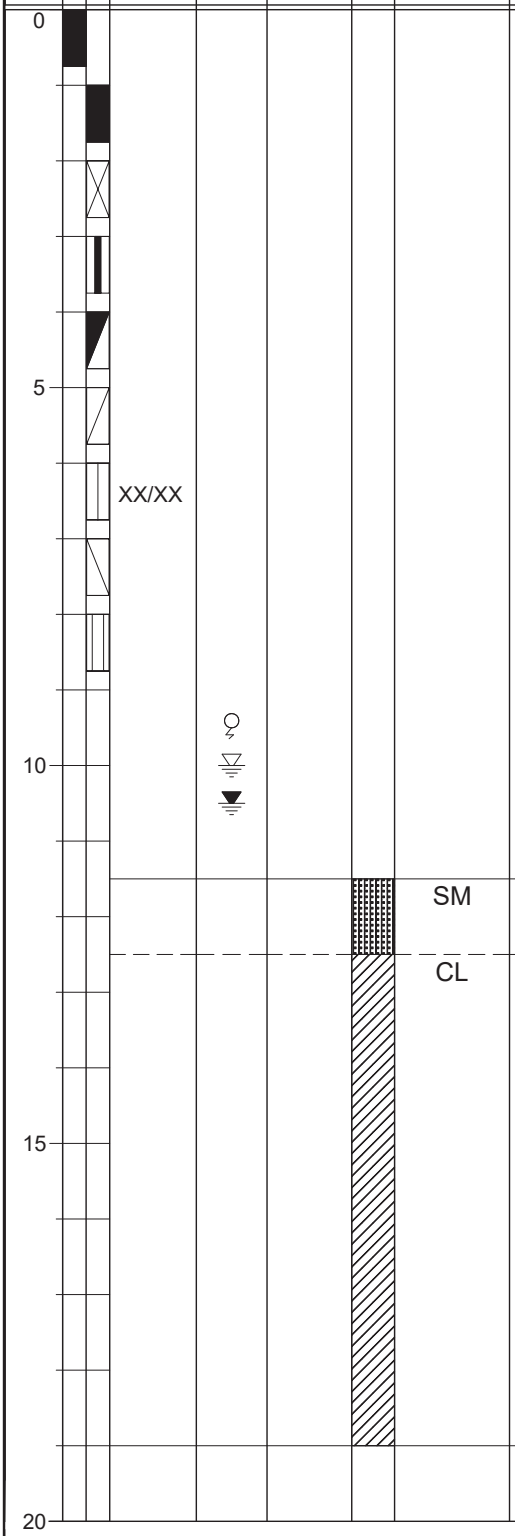
Consistency - Fine-Grained Soil

Consis-tency	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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USCS METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET



Bulk sample.

Modified split-barrel drive sampler.

No recovery with modified split-barrel drive sampler.

Sample retained by others.

Standard Penetration Test (SPT).

No recovery with a SPT.

Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.

No recovery with Shelby tube sampler.

Continuous Push Sample.

Seepage.

Groundwater encountered during drilling.

Groundwater measured after drilling.

SM

MAJOR MATERIAL TYPE (SOIL):

Solid line denotes unit change.

CL

Dashed line denotes material change.

Attitudes: Strike/Dip
b: Bedding
c: Contact
j: Joint
f: Fracture
F: Fault
cs: Clay Seam
s: Shear
bss: Basal Slide Surface
sf: Shear Fracture
sz: Shear Zone
sbs: Shear Bedding Surface

The total depth line is a solid line that is drawn at the bottom of the boring.

DATE DRILLED 4/28/22 BORING NO. B-1A

GROUND ELEVATION 604' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						ML	FILL: Brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
		6	9.8	100.9		SM	ALLUVIUM: Light brown, medium dense, silty SAND with gravel and cobbles; possible boulders; interbeds of poorly graded sand with silt; roots. Brown; loose.
10		49					Very dense. @ 10.3' Seepage; wet. Increase in cobbles and/or boulders between approximately 11 and 15 feet.
		50/5"	11.7	121.0			
		18					TOPANGA FORMATION: Gray, wet, moderately soft, weakly cemented, SANDSTONE; interbedded with thin to thick laminations of dark brown indurated siltstone; trace gravel.
20		50/5"	10.3	127.9			@20': Groundwater encountered during drilling.
		46					
30		50/4"	14.3	112.0			Total Depth - 30.3 feet. Seepage was encountered at approximately 10.3 feet. The groundwater table was encountered at approximately 20 feet during drilling. The boring infilled with water to approximately 10.3 feet 65 minutes after completion of drilling. Backfilled with cement-bentonite grout on 4/28/22. Notes: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40							

FIGURE A- 1

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/28/22 BORING NO. B-2A

GROUND ELEVATION 603' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						ML	FILL: Brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
						SM	ALLUVIUM: Light brown, moist, dense, silty SAND with gravel and cobbles.
		20				SP-SM	Light grayish brown, moist, medium dense, poorly graded SAND with silt, gravel, and cobbles.
		49	4.1	120.7			Increase in cobbles and/or boulders from approximately 8 to 10 feet.
10		61					TOPANGA FORMATION: Dark gray, moist, soft, weakly indurated, SILTSTONE; weathered (residual soil). @ 12': Seepage; wet.
		50/5" 42					Gray, moist, soft, weakly cemented, SANDSTONE; weathered; interbedded with thin to thick laminations of dark brown, weakly indurated SILTSTONE; few gravel.
20		77	9.0	132.0			Dark gray, moist, soft, moderately indurated, sandy CLAYSTONE; weathered; interbedded with thin laminations of light gray, weakly cemented, SANDSTONE.
		25					@25.5': Groundwater measured 3 hours after drilling; wet.
30		50/4"	8.5	121.5			Gray, wet, hard, strongly cemented, SANDSTONE; fine-grained.
							Total Depth - 30.8 feet. Seepage was encountered at approximately 12 feet during drilling. The groundwater table was measured at approximately 25.5 feet after completion of drilling. Backfilled with cement grout on 4/28/22. Notes: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40							

FIGURE A- 2

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/28/22 BORING NO. B-3A

GROUND ELEVATION 600' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
		29	1.5	129.5		SP-SM	ALLUVIUM: Light brown, moist, medium dense, poorly graded SAND with silt and gravel.
10		28				CL	OLDER ALLUVIUM: Reddish brown, moist, hard, sandy lean CLAY.
		50/4" 68				SM	Yellowish brown, moist, very dense, silty SAND with gravel; cobbles and possible boulders between approximately 13 and 15 feet.
20		50/2"	14.2	110.6			Intermixed with clasts of sandstone and siltstone.
		34				CL	Brown, moist, soft, hard, sandy lean CLAY; few to little gravel.
30		71	13.4	120.6			TOPANGA FORMATION: Dark brown, moist, soft, weakly indurated, CLAYSTONE; weathered; interbedded with light gray, weakly cemented, SANDSTONE.
							Total Depth = 31.5 feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 4/28/22. Note: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
40							

DATE DRILLED 4/26/22 - 4/27/22 BORING NO. P-1A

GROUND ELEVATION 604' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						ML	FILL: Brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
		6	9.8	100.9		SM	ALLUVIUM: Light brown, moist, medium dense, silty SAND with gravel and cobbles; possible boulders; interbeds of poorly graded sand with silt; roots. Brown; loose.
10		49					Very dense.
							Total Depth - 10.2 feet. Groundwater was not encountered during drilling. In-situ percolation test performed on 4/27/22. Backfilled with on-site soil on 4/27/22. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20							
30							
40							

FIGURE A- 4

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/26/22 BORING NO. P-2A

GROUND ELEVATION 603' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						ML	FILL: Brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
						SM	ALLUVIUM: Light brown, moist, medium dense, silty SAND with gravel and cobbles.
		20				SP-SM	Light grayish brown, moist, medium dense, poorly graded SAND with silt, gravel, and cobbles.
10		49	4.1	120.7			Increase in cobbles and/or possible boulders from approximately 8 to 10 feet.
							Total Depth - 10.1 feet. Groundwater was not encountered during drilling. In-situ percolation test performed on 4/26/22. Backfilled with on-site soil on 4/26/22. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20							
30							
40							

FIGURE A- 5

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/26/22 BORING NO. P-3A

GROUND ELEVATION 603' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Light brown, moist, medium dense, sandy SILT; trace gravel and cobbles.
		20	1.5	119.1		SP-SM	ALLUVIUM: Light brown, moist, medium dense, poorly graded SAND with silt and gravel.
10		26					Increase in moisture; dense.
							Total Depth - 10.1 feet. Groundwater was not encountered during drilling. In-situ percolation test performed on 4/26/22. Backfilled with on-site soil on 4/26/22. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20							
30							
40							

FIGURE A- 6

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

DATE DRILLED 4/26/22 BORING NO. P-4A

GROUND ELEVATION 599' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (MR Drilling)

DRIVE WEIGHT 140 lbs (Auto. Trip Hammer) DROP 30"

SAMPLED BY ANP LOGGED BY ANP REVIEWED BY GMC

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Light brown, moist, medium dense, sandy SILT; trace gravel; cobbles.
		14				SP-SM	ALLUVIUM: Gray brown, moist, medium dense, poorly graded SAND with silt and gravel.
		26	▽ 8.0	124.3			@8.5': Seepage/groundwater encountered during drilling; wet. @9.3': Seepage/groundwater measured 6 hours after drilling.
10							TOPANGA FORMATION: Yellowish brown, moist, soft, weakly indurated, CLAYSTONE; weathered; interbedded with thin to thick lamination of brown, weakly cemented SANDSTONE. Total Depth - 10.1 feet. Seepage/groundwater was encountered at approximately 8.5 during drilling. Seepage/groundwater was measured at approximately 9.3 feet 6 hours after completion of drilling. Backfilled with 1 foot of bentonite chips and 8 feet of on-site soils on 4/26/22. Notes: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
20							
30							
40							

FIGURE A- 7

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SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

In-Place Moisture and Density Tests
The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix A.

Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-3. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

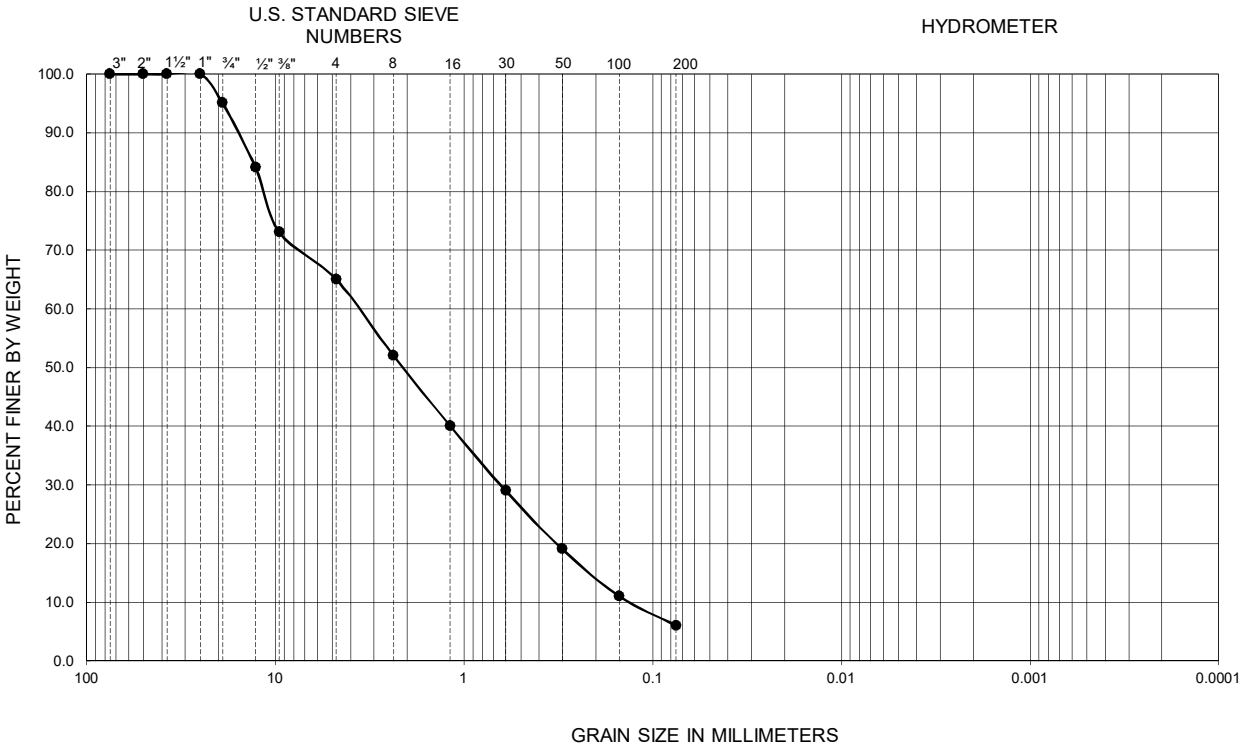
200 Wash
An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the tests are presented on Figure B-4.

Atterberg Limits
Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure B-5.

Direct Shear Tests
Direct shear tests were performed on relatively undisturbed samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figures B-6 and B-7.

Soil Corrosivity Tests
Soil pH and resistivity tests were performed on representative samples in general accordance with CT 643. The soluble sulfate and chloride content of the selected samples were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-8.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-2A	8.5-10.0	--	--	--	0.14	0.64	3.50	25.0	0.8	6	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-1

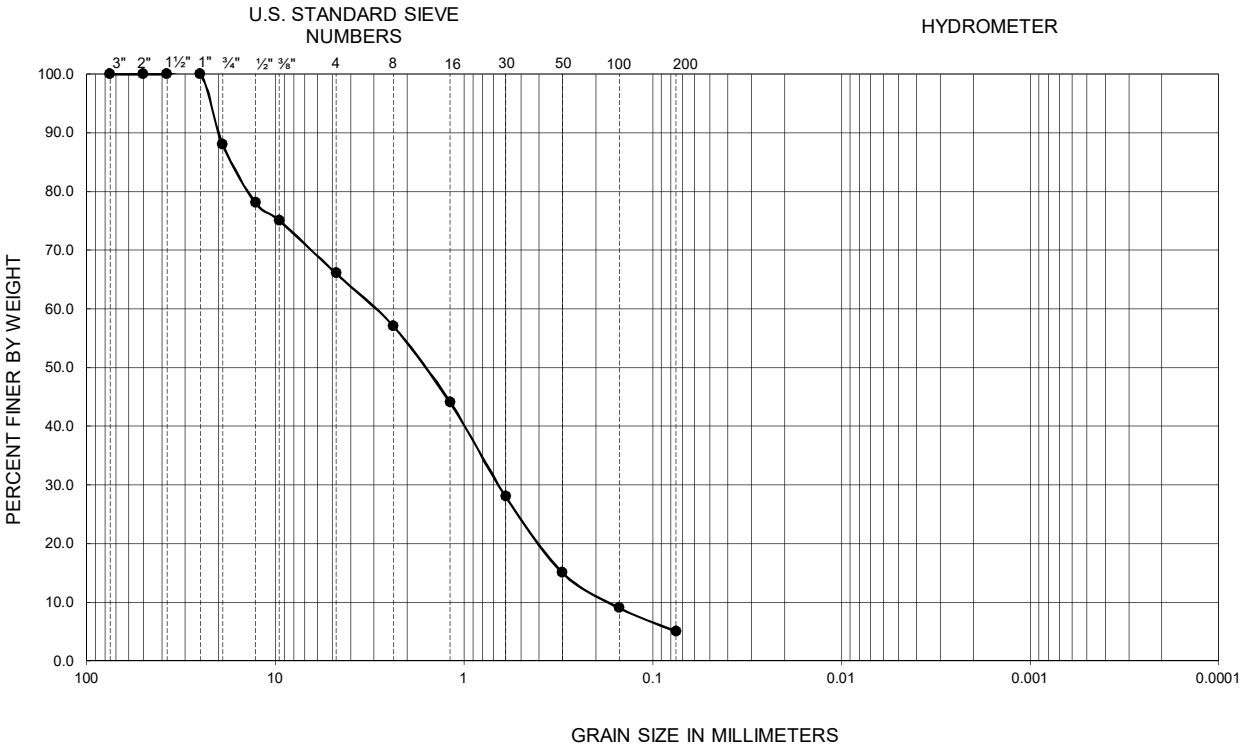
GRADATION TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-3A	8.5-10.0	--	--	--	0.17	0.65	2.85	16.8	0.9	5	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-2

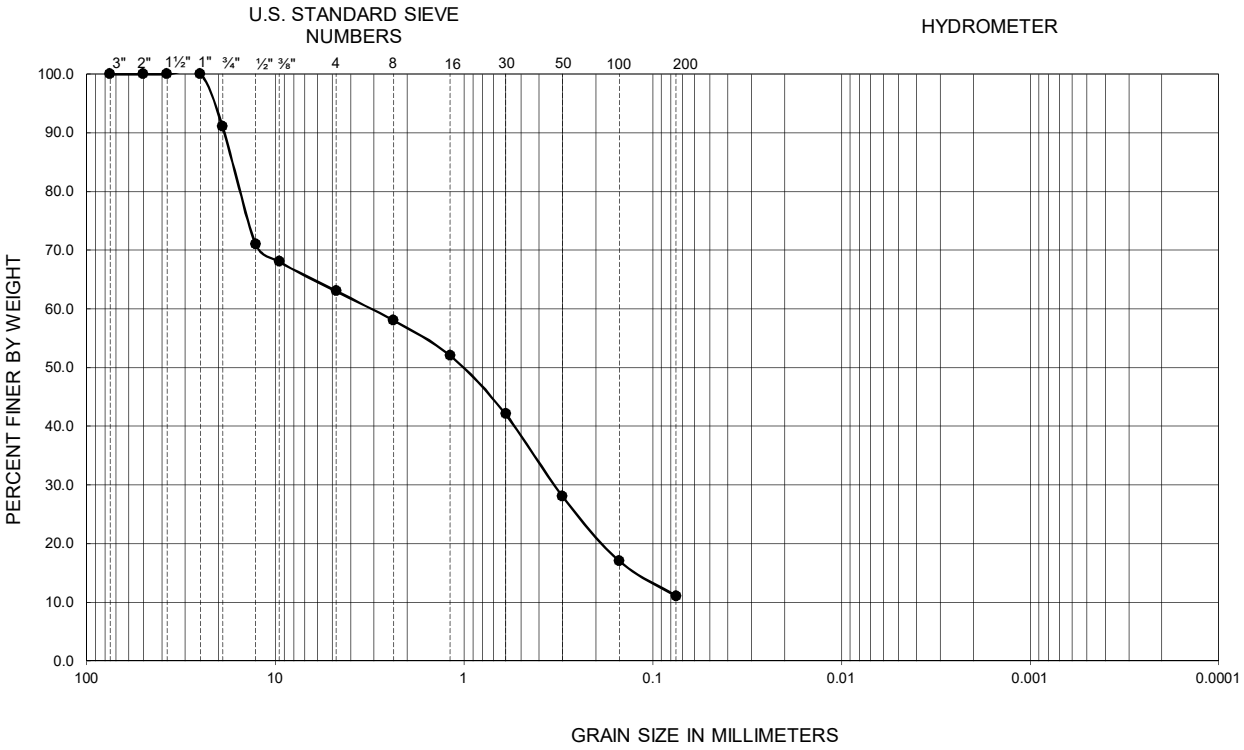
GRADATION TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	P-4A	8.5-9.5	--	--	--		0.33	3.00			11	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

FIGURE B-3

GRADATION TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS OR EQUIVALENT (TOTAL SAMPLE)
B-1A	12.0-13.0	SILTY SAND WITH GRAVEL	73	18	SM
B-1A	25.0-26.5	SILTY SAND	97	46	SM
B-2A	15.0-16.5	SILTY SAND	90	46	SM
B-3A	5.0-6.5	POORLY GRADED SAND WITH SILT AND GRAVEL	54	6	SP-SM
B-3A	15.0-16.5	SILTY SAND WITH GRAVEL	82	29	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

FIGURE B-4

NO. 200 SIEVE ANALYSIS TEST RESULTS

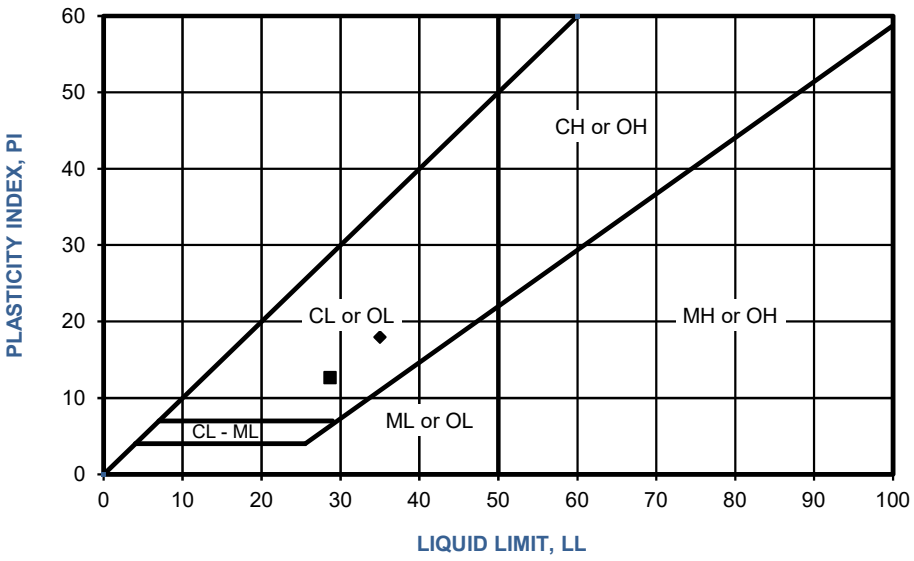
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SOUTH PASADENA, CALIFORNIA

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SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS OR EQUIVALENT
■	B-2A	20.0 - 21.5	29	16	13	CL	CL
◆	B-3A	10.0 - 11.5	35	17	18	CL	CL
○	P-1A	5.0 - 6.5	-	-	NP	ML	SM

NP - INDICATES NON-PLASTIC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

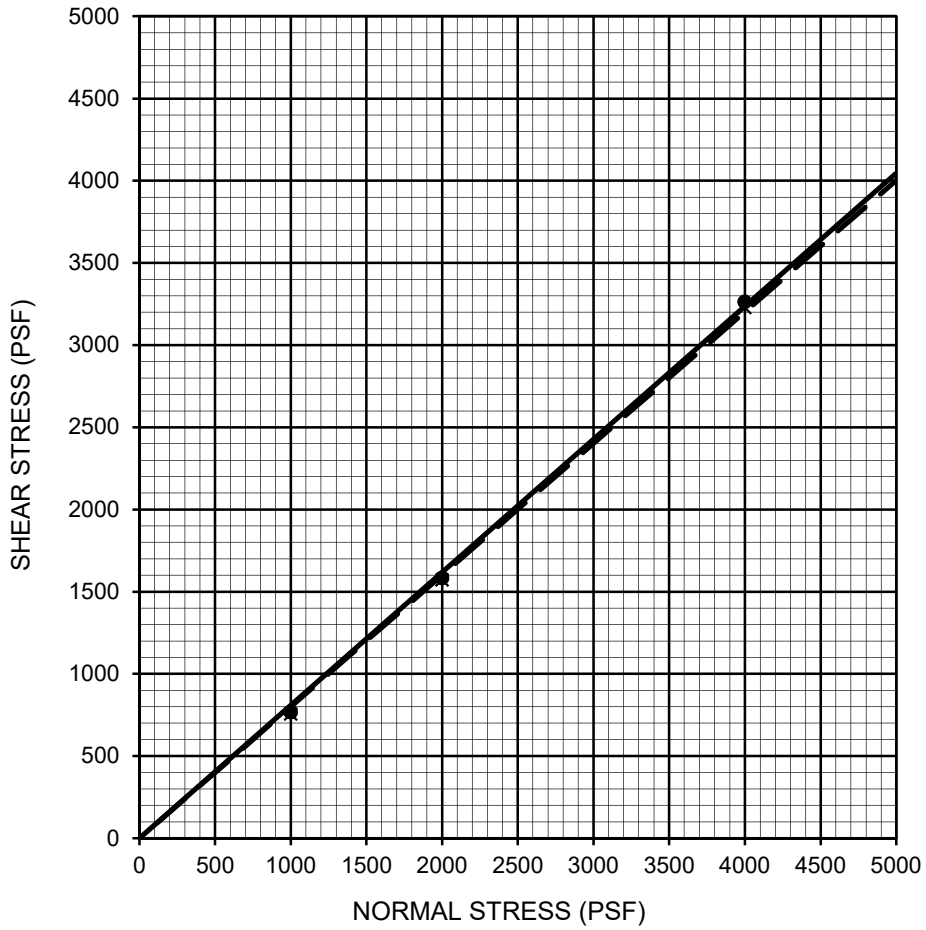
FIGURE B-5

ATTERBERG LIMITS TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
SILTY SAND	—●—	P-1A	5.0-6.5	Peak	0	40	SM
SILTY SAND	– – X – –	P-1A	5.0-6.5	Ultimate	0	40	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

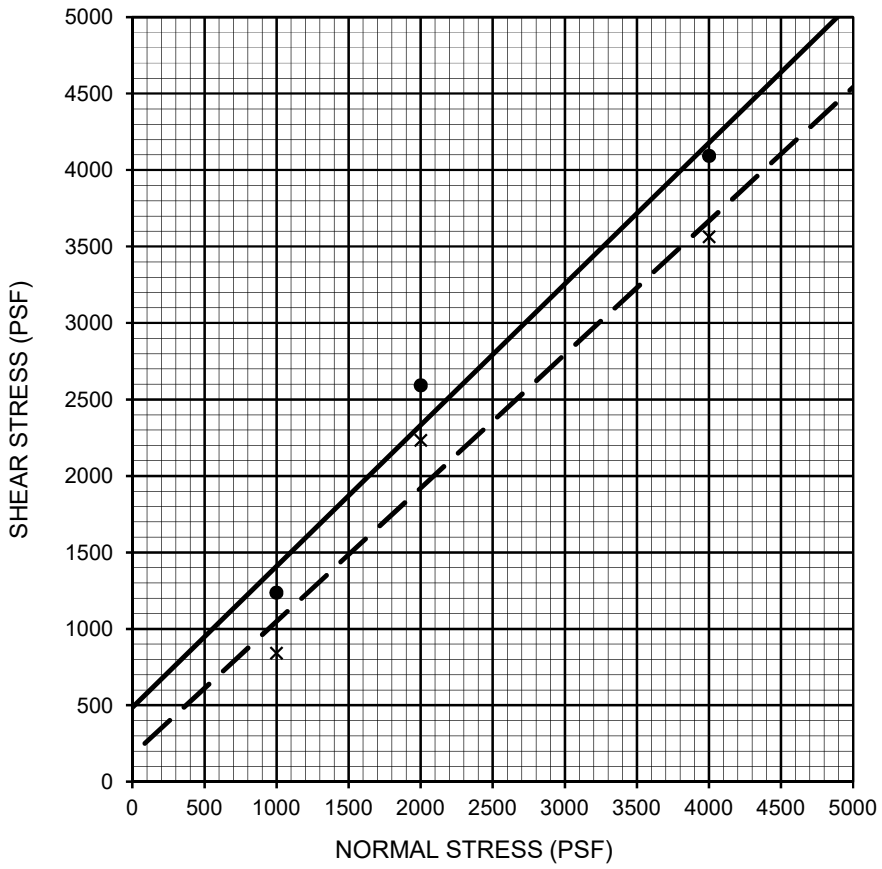
FIGURE B-6

DIRECT SHEAR TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (degrees)	Soil Type
POORLY GRADED SAND WITH SILT AND GRAVEL	●——	P-4A	8.5-9.5	Peak	486	43	SP-SM
POORLY GRADED SAND WITH SILT AND GRAVEL	– – X – –	P-4A	8.5-9.5	Ultimate	174	41	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

FIGURE B-7

DIRECT SHEAR TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
P-2A	0.0-5.0	5.8	6,950	10	0.001	85

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

FIGURE B-8

CORROSIVITY TEST RESULTS

SAN PASCUAL TREATMENT WETLAND
SOUTH PASADENA, CALIFORNIA

Ninyo & Moore
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APPENDIX C

Analytical Test Results (Drum Characterization)

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

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Lake Forest, California 92630
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949.297.5027 Fax

09 May 2022

Aura Scharf
Ninyo & Moore
475 Goddard, Ste. 200
Irvine, CA 92618

RE: Arroyo Seco - San Rafael Water Reuse 2 Natural

Enclosed are the results of analyses for samples received by the laboratory on 04/29/22 16:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joann Marroquin For Taili Iinuma
Project Manager

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Drum #1_B-3	T221276-01	Soil	04/27/22 15:10	04/29/22 16:55
Composite 2:1 Drum#2_B-2A - Drum #1_B-1A	T221276-04	Soil	04/28/22 11:30	04/29/22 16:55

SunStar Laboratories, Inc.

Joann Marroquin

Joann Marroquin For Taili Iinuma, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

DETECTIONS SUMMARY

Sample ID: Drum #1_B-3 **Laboratory ID:** T221276-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**57**	1.0	mg/kg	EPA 6010b	
Chromium	**26**	2.0	mg/kg	EPA 6010b	
Cobalt	**4.1**	2.0	mg/kg	EPA 6010b	
Copper	**5.4**	1.0	mg/kg	EPA 6010b	
Nickel	**2.8**	2.0	mg/kg	EPA 6010b	
Vanadium	**25**	5.0	mg/kg	EPA 6010b	
Zinc	**22**	1.0	mg/kg	EPA 6010b	

Sample ID: Composite 2:1 Drum#2_B-2A - Drum **Laboratory ID:** T221276-04

Analyte	Result	Reporting Limit	Units	Method	Notes
Barium	**45**	1.0	mg/kg	EPA 6010b	
Chromium	**26**	2.0	mg/kg	EPA 6010b	
Cobalt	**6.2**	2.0	mg/kg	EPA 6010b	
Copper	**8.3**	1.0	mg/kg	EPA 6010b	
Nickel	**8.3**	2.0	mg/kg	EPA 6010b	
Vanadium	**45**	5.0	mg/kg	EPA 6010b	
Zinc	**38**	1.0	mg/kg	EPA 6010b	
Mercury	**0.13**	0.10	mg/kg	EPA 7471A Soil	

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Joann Marroquin

Joann Marroquin For Taili Iinuma, Project Manager

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	22E0008	05/02/22	05/06/22	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*90.3 %*	*65-135*		"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	22E0004	05/02/22	05/03/22	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**57**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/03/22	"	
Cadmium	ND	2.0	"	"	"	"	05/03/22	"	
Chromium	**26**	2.0	"	"	"	"	"	"	
Cobalt	**4.1**	2.0	"	"	"	"	"	"	
Copper	**5.4**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**2.8**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**25**	5.0	"	"	"	"	"	"	
Zinc	**22**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	ND	0.10	mg/kg	1	22E0005	05/02/22	05/03/22	EPA 7471A Soil	

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Joann Marroquin For Taili Iinuma, Project Manager

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

SunStar Laboratories, Inc.

Joann Marroquin

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Joann Marroquin For Taili Iinuma, Project Manager

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	2.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Acetone	ND	5.0	"	"	"	"	"	"	
Methyl ethyl ketone	ND	5.0	"	"	"	"	"	"	
Methyl isobutyl ketone	ND	5.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*75.4-139*		"	"	"	"	

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Drum #1_B-3

T221276-01 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*91.8 %*	*73.1-125*		*22E0023*	*05/02/22*	*05/03/22*	*EPA 8260B*	
Surrogate: Toluene-d8		*97.8 %*	*82.6-117*		*"*	*"*	*"*	*"*	

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Extractable Petroleum Hydrocarbons by 8015B									
C6-C12 (GRO)	ND	10	mg/kg	1	22E0008	05/02/22	05/06/22	EPA 8015B	
C13-C28 (DRO)	ND	10	"	"	"	"	"	"	
C29-C40 (MORO)	ND	10	"	"	"	"	"	"	
Surrogate: p-Terphenyl		*93.0 %*		*65-135*	"	"	"	"	
Metals by EPA 6010B									
Antimony	ND	3.0	mg/kg	1	22E0004	05/02/22	05/03/22	EPA 6010b	
Silver	ND	2.0	"	"	"	"	"	"	
Arsenic	ND	5.0	"	"	"	"	"	"	
Barium	**45**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.0	"	"	"	"	05/03/22	"	
Cadmium	ND	2.0	"	"	"	"	05/03/22	"	
Chromium	**26**	2.0	"	"	"	"	"	"	
Cobalt	**6.2**	2.0	"	"	"	"	"	"	
Copper	**8.3**	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	
Molybdenum	ND	5.0	"	"	"	"	"	"	
Nickel	**8.3**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Thallium	ND	5.0	"	"	"	"	"	"	
Vanadium	**45**	5.0	"	"	"	"	"	"	
Zinc	**38**	1.0	"	"	"	"	"	"	
Cold Vapor Extraction EPA 7470/7471									
Mercury	**0.13**	0.10	mg/kg	1	22E0005	05/02/22	05/03/22	EPA 7471A Soil	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromobenzene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
Bromochloromethane	ND	2.5	"	"	"	"	"	"	
Bromodichloromethane	ND	2.5	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
Bromomethane	ND	2.5	"	"	"	"	"	"	
n-Butylbenzene	ND	2.5	"	"	"	"	"	"	
sec-Butylbenzene	ND	2.5	"	"	"	"	"	"	
tert-Butylbenzene	ND	2.5	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.5	"	"	"	"	"	"	
Chlorobenzene	ND	2.5	"	"	"	"	"	"	
Chloroethane	ND	2.5	"	"	"	"	"	"	
Chloroform	ND	2.5	"	"	"	"	"	"	
Chloromethane	ND	2.5	"	"	"	"	"	"	
2-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
4-Chlorotoluene	ND	2.5	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	2.5	"	"	"	"	"	"	
Dibromomethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.5	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,3-Dichloropropane	ND	2.5	"	"	"	"	"	"	
2,2-Dichloropropane	ND	2.5	"	"	"	"	"	"	
1,1-Dichloropropene	ND	2.5	"	"	"	"	"	"	

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
cis-1,3-Dichloropropene	ND	2.5	ug/kg	1	22E0023	05/02/22	05/03/22	EPA 8260B	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
Hexachlorobutadiene	ND	2.5	"	"	"	"	"	"	
Isopropylbenzene	ND	2.5	"	"	"	"	"	"	
p-Isopropyltoluene	ND	2.5	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
Naphthalene	ND	2.5	"	"	"	"	"	"	
n-Propylbenzene	ND	2.5	"	"	"	"	"	"	
Styrene	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Trichloroethene	ND	2.5	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	2.5	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	2.5	"	"	"	"	"	"	
Vinyl chloride	ND	2.5	"	"	"	"	"	"	
Benzene	ND	2.5	"	"	"	"	"	"	
Toluene	ND	2.5	"	"	"	"	"	"	
Ethylbenzene	ND	2.5	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	2.5	"	"	"	"	"	"	
Acetone	ND	5.0	"	"	"	"	"	"	
Methyl ethyl ketone	ND	5.0	"	"	"	"	"	"	
Methyl isobutyl ketone	ND	5.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.8 %*	*75.4-139*		"	"	"	"	

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Composite 2:1 Drum#2_B-2A - Drum #1_B-1A

T221276-04 (Soil)

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Volatile Organic Compounds by EPA Method 8260B									
Surrogate: Dibromofluoromethane	*96.4 %*		*73.1-125*		*22E0023*	*05/02/22*	*05/03/22*	*EPA 8260B*	
Surrogate: Toluene-d8	*95.2 %*		*82.6-117*		*"*	*"*	*"*	*"*	

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Extractable Petroleum Hydrocarbons by 8015B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0008 - EPA 3550B GC										
Blank (22E0008-BLK1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C6-C12 (GRO)	ND	10	mg/kg							
C13-C28 (DRO)	ND	10	"							
C29-C40 (MORO)	ND	10	"							
Surrogate: p-Terphenyl	*91.7*		*"*	*100*		*91.7*	*65-135*			
LCS (22E0008-BS1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C13-C28 (DRO)	400	10	mg/kg	500		80.9	75-125			
Surrogate: p-Terphenyl	*91.7*		*"*	*100*		*91.7*	*65-135*			
LCS Dup (22E0008-BSD1)				Prepared: 05/02/22 Analyzed: 05/06/22						
C13-C28 (DRO)	410	10	mg/kg	500		82.3	75-125	1.76	20	
Surrogate: p-Terphenyl	*91.9*		*"*	*100*		*91.9*	*65-135*			

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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0004 - EPA 3050B										
Blank (22E0004-BLK1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Antimony	ND	3.0	mg/kg							
Silver	ND	2.0	"							
Arsenic	ND	5.0	"							
Barium	ND	1.0	"							
Beryllium	ND	1.0	"							
Cadmium	ND	2.0	"							
Chromium	ND	2.0	"							
Cobalt	ND	2.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							
Molybdenum	ND	5.0	"							
Nickel	ND	2.0	"							
Selenium	ND	5.0	"							
Thallium	ND	5.0	"							
Vanadium	ND	5.0	"							
Zinc	ND	1.0	"							
LCS (22E0004-BS1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	102	5.0	mg/kg	100		102	75-125			
Barium	99.9	1.0	"	100		99.9	75-125			
Cadmium	99.0	2.0	"	100		99.0	75-125			
Chromium	99.8	2.0	"	100		99.8	75-125			
Lead	102	3.0	"	100		102	75-125			
Matrix Spike (22E0004-MS1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	81.2	5.0	mg/kg	100	0.812	80.4	75-125			
Barium	106	1.0	"	100	27.1	78.9	75-125			
Cadmium	80.6	2.0	"	100	0.153	80.5	75-125			
Chromium	86.7	2.0	"	100	7.24	79.5	75-125			
Lead	75.1	3.0	"	100	2.48	72.6	75-125			QM-05

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0004 - EPA 3050B										
Matrix Spike Dup (22E0004-MSD1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Arsenic	78.7	5.0	mg/kg	100	0.812	77.9	75-125	3.03	20	
Barium	113	1.0	"	100	27.1	86.0	75-125	6.41	20	
Cadmium	75.1	2.0	"	100	0.153	74.9	75-125	7.15	20	QM-05
Chromium	84.2	2.0	"	100	7.24	76.9	75-125	2.99	20	
Lead	75.9	3.0	"	100	2.48	73.4	75-125	1.07	20	QM-05

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Cold Vapor Extraction EPA 7470/7471 - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0005 - EPA 7471A Soil										
Blank (22E0005-BLK1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	ND	0.10	mg/kg							
LCS (22E0005-BS1)				Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.347	0.10	mg/kg	0.410		84.8	80-120			
Matrix Spike (22E0005-MS1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.329	0.10	mg/kg	0.385	ND	85.6	75-125			
Matrix Spike Dup (22E0005-MSD1)	**Source: T221266-01**			Prepared: 05/02/22 Analyzed: 05/03/22						
Mercury	0.279	0.10	mg/kg	0.397	ND	70.3	75-125	16.6	20	QM-05

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475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
Blank (22E0023-BLK1)				Prepared & Analyzed: 05/02/22						
Bromobenzene	ND	2.5	ug/kg							
Bromochloromethane	ND	2.5	"							
Bromodichloromethane	ND	2.5	"							
Bromoform	ND	2.5	"							
Bromomethane	ND	2.5	"							
n-Butylbenzene	ND	2.5	"							
sec-Butylbenzene	ND	2.5	"							
tert-Butylbenzene	ND	2.5	"							
Carbon tetrachloride	ND	2.5	"							
Chlorobenzene	ND	2.5	"							
Chloroethane	ND	2.5	"							
Chloroform	ND	2.5	"							
Chloromethane	ND	2.5	"							
2-Chlorotoluene	ND	2.5	"							
4-Chlorotoluene	ND	2.5	"							
Dibromochloromethane	ND	2.5	"							
1,2-Dibromo-3-chloropropane	ND	5.0	"							
1,2-Dibromoethane (EDB)	ND	2.5	"							
Dibromomethane	ND	2.5	"							
1,2-Dichlorobenzene	ND	2.5	"							
1,3-Dichlorobenzene	ND	2.5	"							
1,4-Dichlorobenzene	ND	2.5	"							
Dichlorodifluoromethane	ND	2.5	"							
1,1-Dichloroethane	ND	2.5	"							
1,2-Dichloroethane	ND	2.5	"							
1,1-Dichloroethene	ND	2.5	"							
cis-1,2-Dichloroethene	ND	2.5	"							
trans-1,2-Dichloroethene	ND	2.5	"							
1,2-Dichloropropane	ND	2.5	"							
1,3-Dichloropropane	ND	2.5	"							
2,2-Dichloropropane	ND	2.5	"							
1,1-Dichloropropene	ND	2.5	"							
cis-1,3-Dichloropropene	ND	2.5	"							
trans-1,3-Dichloropropene	ND	2.5	"							
Hexachlorobutadiene	ND	2.5	"							
Isopropylbenzene	ND	2.5	"							

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Joann Marroquin For Taili Iinuma, Project Manager

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Providing Quality Analytical Services Nationwide

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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
Blank (22E0023-BLK1)				Prepared & Analyzed: 05/02/22						
p-Isopropyltoluene	ND	2.5	ug/kg							
Methylene chloride	ND	10	"							
Naphthalene	ND	2.5	"							
n-Propylbenzene	ND	2.5	"							
Styrene	ND	2.5	"							
1,1,2,2-Tetrachloroethane	ND	2.5	"							
1,1,1,2-Tetrachloroethane	ND	2.5	"							
Tetrachloroethene	ND	2.5	"							
1,2,3-Trichlorobenzene	ND	2.5	"							
1,2,4-Trichlorobenzene	ND	2.5	"							
1,1,2-Trichloroethane	ND	2.5	"							
1,1,1-Trichloroethane	ND	2.5	"							
Trichloroethene	ND	2.5	"							
Trichlorofluoromethane	ND	2.5	"							
1,2,3-Trichloropropane	ND	2.5	"							
1,3,5-Trimethylbenzene	ND	2.5	"							
1,2,4-Trimethylbenzene	ND	2.5	"							
Vinyl chloride	ND	2.5	"							
Benzene	ND	2.5	"							
Toluene	ND	2.5	"							
Ethylbenzene	ND	2.5	"							
m,p-Xylene	ND	5.0	"							
o-Xylene	ND	2.5	"							
Acetone	ND	5.0	"							
Methyl ethyl ketone	ND	5.0	"							
Methyl isobutyl ketone	ND	5.0	"							
2-Hexanone (MBK)	ND	5.0	"							
Surrogate: 4-Bromofluorobenzene	*52.6*		*"*	*50.0*		*105*	*75.4-139*			
Surrogate: Dibromofluoromethane	*46.4*		*"*	*50.0*		*92.7*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.6*	*82.6-117*			

SunStar Laboratories, Inc.

Joann Marroquin

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Providing Quality Analytical Services Nationwide

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949.297.5027 Fax

Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 22E0023 - EPA 5030 GCMS										
LCS (22E0023-BS1)				Prepared & Analyzed: 05/02/22						
Chlorobenzene	53.0	2.5	ug/kg	50.0		106	65.2-124			
1,1-Dichloroethene	52.1	2.5	"	50.0		104	60.9-131			
Trichloroethene	53.7	2.5	"	50.0		107	62.1-126			
Benzene	49.9	2.5	"	50.0		99.8	65.3-127			
Toluene	49.7	2.5	"	50.0		99.4	64.3-122			
Surrogate: 4-Bromofluorobenzene	*48.9*		*"*	*50.0*		*97.9*	*75.4-139*			
Surrogate: Dibromofluoromethane	*47.0*		*"*	*50.0*		*94.1*	*73.1-125*			
Surrogate: Toluene-d8	*49.6*		*"*	*50.0*		*99.3*	*82.6-117*			
Matrix Spike (22E0023-MS1)	**Source: T221277-02**			Prepared & Analyzed: 05/02/22						
Chlorobenzene	46.0	2.5	ug/kg	50.0	ND	92.0	65.2-125			
1,1-Dichloroethene	41.2	2.5	"	50.0	ND	82.5	60.9-131			
Trichloroethene	44.8	2.5	"	50.0	ND	89.6	62.1-126			
Benzene	41.6	2.5	"	50.0	ND	83.2	65.3-127			
Toluene	42.8	2.5	"	50.0	ND	85.7	64.3-125			
Surrogate: 4-Bromofluorobenzene	*48.9*		*"*	*50.0*		*97.9*	*75.4-139*			
Surrogate: Dibromofluoromethane	*45.6*		*"*	*50.0*		*91.2*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.7*	*82.6-117*			
Matrix Spike Dup (22E0023-MSD1)	**Source: T221277-02**			Prepared & Analyzed: 05/02/22						
Chlorobenzene	48.0	2.5	ug/kg	50.0	ND	95.9	65.2-125	4.13	20	
1,1-Dichloroethene	47.0	2.5	"	50.0	ND	94.1	60.9-131	13.1	20	
Trichloroethene	47.7	2.5	"	50.0	ND	95.3	62.1-126	6.25	20	
Benzene	44.8	2.5	"	50.0	ND	89.5	65.3-127	7.34	20	
Toluene	44.6	2.5	"	50.0	ND	89.2	64.3-125	4.02	20	
Surrogate: 4-Bromofluorobenzene	*49.1*		*"*	*50.0*		*98.1*	*75.4-139*			
Surrogate: Dibromofluoromethane	*47.3*		*"*	*50.0*		*94.7*	*73.1-125*			
Surrogate: Toluene-d8	*49.3*		*"*	*50.0*		*98.6*	*82.6-117*			

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Joann Marroquin For Taili Iinuma, Project Manager

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PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

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949.297.5020 Phone
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Ninyo & Moore	Project: Arroyo Seco - San Rafael Water Reuse 2 Natural	
475 Goddard, Ste. 200	Project Number: 211880001	**Reported:**
Irvine CA, 92618	Project Manager: Aura Scharf	05/09/22 16:51

Notes and Definitions

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Joann Marroquin For Taili Iinuma, Project Manager

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Lake Forest, CA 92630
949-297-5020

Chain of Custody Record

Client: Ninyo & Moore
Address: 475 Goddard, Suite 200
Phone: 949-753-7070 Fax:
Project Manager: Aura Scharf ascharf@ninyoandmoore.com

Date: 4/29/22 Page: 1 Of 1
Project Name: Arroyo Seco - San Rafael Water Reuse & Natural Stream Restoration Project
Collector: Allison Prizlow (ANP) Client Project #: 211880001
Batch #: T221276 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260 (VOCs)	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals					Laboratory ID #	Comments/Preservative	Total # of containers
DRUM#1_B-3	4/27/22	3:10	Soil	4oz Jar	X							X	X					1	one test	
DRUM#2_B-2A	4/28/22	11:30	Soil	4oz Jar	X							X	X					2	composite 2 JARS (one test)	
DRUM#1_B-1A	4/28/22	3:35	Soil	4oz Jar	X							X	X					3		

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
Allison Prizlow	4/29/22; 2:59		4/29/22; 2:59
	4/29/22; 4:30		4/29/22 16:30
	4/29/22 16:55		4.29.22 1655

Total # of containers
Chain of Custody seals Y/N/NA
Seals intact? Y/N/NA
Received good condition/cold 2.7°C
Turn around time: STD

Notes
2 tests total

Sample disposal Instructions: Disposal @ $2.00 each ____ Return to client ____ Pickup ____

SunStar Laboratories, Inc.
Providing Quality Analytical Services Nationwide

SAMPLE RECEIVING REVIEW SHEET

Batch/Work Order #: T221276

Client Name: NINYO & MOORE

Project: ARROYO SECO. SAN RAFAEL WATER REUSE 2 NATURAL STREAM RESTORATION

Delivered by: ☐ Client ☑ SunStar Courier ☐ GLS ☐ FedEx ☐ UPS

If Courier, Received by: MARVIN

Date/Time Courier Received: 4-29-22 16:30

Lab Received by: DAVE

Date/Time Lab Received: 4-29-22 16:55

Total number of coolers received: 1 Thermometer ID: SC-1 Calibration due: 8/24/22

Temperature: Cooler #1 2.0	°C +/- the CF (+0.1 °C)	= 2.1	°C corrected temperature
Temperature: Cooler #2	°C +/- the CF (+0.1 °C)	=	°C corrected temperature
Temperature: Cooler #3	°C +/- the CF (+0.1 °C)	=	°C corrected temperature
Temperature criteria = ≤ 6°C (no frozen containers)	Within criteria?	☑ Yes ☐ No ☐ N/A	
If NO:			
Samples received on ice?	☐ Yes	☐ No → **Complete Non-Conformance Sheet**	
If on ice, samples received same day collected?	☐ Yes → Acceptable	☐ No → **Complete Non-Conformance Sheet**	

Custody seals intact on cooler/sample	☐ Yes	☐ No*	☑ N/A
Sample containers intact	☑ Yes	☐ No*	
Sample labels match Chain of Custody IDs	☑ Yes	☐ No*	
Total number of containers received match COC	☑ Yes	☐ No*	
Proper containers received for analyses requested on COC	☑ Yes	☐ No*	
Proper preservative indicated on COC/containers for analyses requested	☐ Yes	☐ No*	☒ N/A
Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times	☑ **Yes**	☐ **No***	

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date: MV 4-29-22

Comments:

SunStar Laboratories, Inc.
PROVIDING QUALITY ANALYTICAL SERVICES NATIONWIDE

WORK ORDER

T221276

Client: **Ninyo & Moore** **Project Manager:** **Taili Iinuma**

Project: **Arroyo Seco - San Rafael Water Reuse 2 Natural** **Project Number:** **211880001**

Report To:

Ninyo & Moore
Aura Scharf
475 Goddard, Ste. 200
Irvine, CA 92618

Date Due:	05/09/22 17:00 (5 day TAT)		
Received By:	Dave Berner	Date Received:	04/29/22 16:55
Logged In By:	Jennifer Berger	Date Logged In:	05/02/22 11:31

Samples Received at: **2.7°C**

Custody Seals	No	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirı	No		

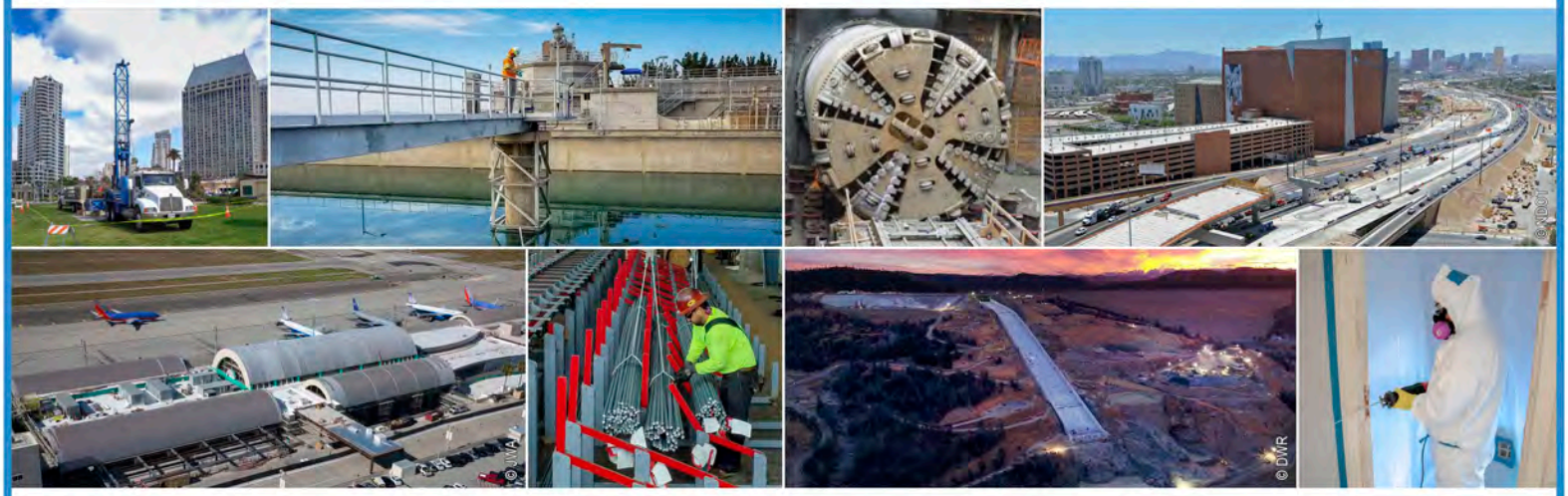
Analysis	Due	TAT	Expires	Comments
T221276-01 Drum #1_B-3 [Soil] Sampled 04/27/22 15:10 (GMT-08:00) Pacific Time (US &				
6010 Title 22	05/09/22 15:00	5	10/24/22 15:10	
8015 Carbon Chain	05/09/22 15:00	5	05/11/22 15:10	
8260	05/09/22 15:00	5	05/11/22 15:10	
T221276-02 Drum #2_B-2A [Soil] Sampled 04/28/22 11:30 (GMT-08:00) Pacific Time (US &				
[NO ANALYSES]				
T221276-03 Drum #1_B-1A [Soil] Sampled 04/28/22 15:35 (GMT-08:00) Pacific Time (US &				
[NO ANALYSES]				
T221276-04 Composite 2:1 Drum#2_B-2A - Drum #1_B-1A [Soil] Sampled 04/28/22 11:30 (GMT-08:00) Pacific Time (US &				**Composite samples Drum#2_B-2A, Drum#1_B-1A # 2,3**
6010 Title 22	05/09/22 15:00	5	10/25/22 11:30	
8015 Carbon Chain	05/09/22 15:00	5	05/12/22 11:30	
8260	05/09/22 15:00	5	05/12/22 11:30	

Analysis groups included in this work order

6010 Title 22

subgroup 6010B T22 7470/71 Hg

Reviewed By Date



475 Goddard, Suite 200 | Irvine, California 92618 | p. 949.753.7070

ARIZONA | CALIFORNIA | COLORADO | NEVADA | TEXAS | UTAH

ninyoandmoore.com

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

Appendix G

Noise Supporting Documentation

San Pascual

FIELD NOISE MEASUREMENT DATA

PROJECT: ~~San Pascual~~ Arroyo Seco Water Reuse PROJ. #

SITE IDENTIFICATION: OBSERVER(S):

START DATE/TIME: Friday 6/9/23 16:30 hrs END DATE/TIME: Friday 6/9/23 19:00 hrs

ADDRESS:

METEOROLOGICAL CONDITIONS: wind coming from W direction

TEMP: 69.1 °F HUMIDITY: 65.3 %R.H. WIND: ☐ CALM ☐ LIGHT ☒ MODERATE ☐ VARIABLE

WINDSPEED: 3.4 MPH DIR: ☐ N ☐ NE ☐ E ☐ SE ☐ S ☑ W ☐ NW ☐ STEADY ☐ GUSTY

SKY: ☐ SUNNY ☒ CLEAR ☐ OVRCST ☐ PRTLY CLOUDY ☐ FOG ☐ RAIN ☐ OTHER:

ACOUSTIC INSTRUMENTS:

INSTRUMENT: TYPE: ☐ 1 ☐ 2 SERIAL #:

CALIBRATOR: SERIAL #:

CALIBRATION CHECK: PRE-TEST 0.00 dBA SPL POST-TEST -0.06 dBA SPL WINDSCREEN

SETTINGS: ☐ A-WEIGHTED ☐ SLOW ☐ FAST ☐ FRONTAL ☐ RANDOM ☐ ANSI ☐ OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	OTHER:	(TYPE?)	
NM1	5:02	5:24	62.6	77.4	56.7						
NM2	5:39	6:00	64.4	80.6	50.5						
NM3	6:20	6:41	57.1	78.6	40.5						

COMMENTS:

SOURCE INFO AND TRAFFIC COUNTS:

PRIMARY NOISE SOURCE: ☒ TRAFFIC ☐ AIRCRAFT ☐ RAIL ☐ INDUSTRIAL ☒ AMBIENT ☐ OTHER:

ROADWAY TYPE:

TRAFFIC COUNT DURATION:	-MIN		SPEED		#2 COUNT		SPEED	
	☐NB/☐EB	☐SB/☐WB	☐NB/☐EB	☐SB/☐WB	☐NB/☐EB	☐SB/☐WB	☐NB/☐EB	☐SB/☐WB
AUTOS	NM1 49	NM2 57	NM3 No cars visible from location below bridge					
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: ☐ RADAR ☐ DRIVING ☐ OBSERVER

OTHER SOURCES: ☐ DIST. AIRCRAFT ☐ RUSTLING LEAVES ☐ DIST. BARKING DOGS ☐ BIRDS ☐ DIST. INDUSTRIAL ☐ DIST. CHILDREN PLAYING ☐ DIST. TRAFFIC ☐ DIST. LANDSCAPING ACTIVITIES ☐ OTHER:

DESCRIPTION/SKETCH:

TERRAIN: ☐ HARD ☐ SOFT ☐ MIXED ☐ FLAT ☐ OTHER:

PHOTOS:

OTHER COMMENTS/SKETCH:

NM1: Across a sports field next to wash, playground adjacent to field with children practicing soccer & playing in playground

NM2: Across a baseball field with 20+ adults & children watching a game

NM3: Hiking and horse trail under a bridge and next to a wash, unable to see vehicles above crossing bridge

Construction Generated Noise - San Rafael

Building Type	Roads, Sewers, Trenches		**Distance (ft)**
Construction Noise at 50 Feet (dBA Leq)			50
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	84	84	
Excavation	88	78	
Foundation Construction	88	88	
Building Construction	79	78	
Finishing and Site Cleanup	84	84	

North - San Rafael Ave Residences

Maximum Construction Noise (dBA Leq)			80
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	80	80	
Excavation (Site Preparation)	84	74	
Foundation Construction	84	84	
Building Construction	75	74	
Paving	80	80	
Average Construction Noise (dBA Leq)			350
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	67	67	
Excavation (Site Preparation)	71	61	
Foundation Construction	71	71	
Building Construction	62	61	
Paving	67	67	

West - Aratina St Residences

Maximum Construction Noise (dBA Leq)			170
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	73	73	
Excavation (Site Preparation)	77	67	
Foundation Construction	77	77	
Building Construction	68	67	
Paving	73	73	
Average Construction Noise (dBA Leq)			380
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	66	66	
Excavation (Site Preparation)	70	60	
Foundation Construction	70	70	
Building Construction	61	60	
Paving	66	66	

South - San Pascual Stables

Maximum Construction Noise (dBA Leq)			60
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	82	82	
Excavation (Site Preparation)	86	76	
Foundation Construction	86	86	
Building Construction	77	76	
Paving	82	82	
Average Construction Noise (dBA Leq)			130
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	76	76	
Excavation (Site Preparation)	80	70	
Foundation Construction	80	80	
Building Construction	71	70	
Paving	76	76	

East - Arroyo Dr Residences

Maximum Construction Noise (dBA Leq)			340
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	67	67	
Excavation (Site Preparation)	71	61	
Foundation Construction	71	71	
Building Construction	62	61	
Paving	67	67	
Average Construction Noise (dBA Leq)			580
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	63	63	
Excavation (Site Preparation)	67	57	
Foundation Construction	67	67	
Building Construction	58	57	
Paving	63	63	

100 feet Reference Distance			
Maximum Construction Noise (dBA Leq)			100
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	78	78	
Excavation (Site Preparation)	82	72	
Foundation Construction	82	82	
Building Construction	73	72	
Paving	78	78	
Average Construction Noise (dBA Leq)			100
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	78	78	
Excavation (Site Preparation)	82	72	
Foundation Construction	82	82	
Building Construction	73	72	
Paving	78	78	

Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for the USEPA, December 31, 1971. Based on analysis for Office Building, Hotel, Hospital, School, and Public Works.

Construction Generated Noise - San Pascual

Building Type	Roads, Sewers, Trenches		**Distance (ft)**
Construction Noise at 50 Feet (dBA Leq)			50
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	84	84	
Excavation	88	78	
Foundation Construction	88	88	
Building Construction	79	78	
Finishing and Site Cleanup	84	84	

North - San Ramon Drive Residences

Maximum Construction Noise (dBA Leq)			30
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	88	88	
Excavation (Site Preparation)	92	82	
Foundation Construction	92	92	
Building Construction	83	82	
Paving	88	88	
Average Construction Noise (dBA Leq)			460
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	65	65	
Excavation (Site Preparation)	69	59	
Foundation Construction	69	69	
Building Construction	60	59	
Paving	65	65	

West - San Pascual Ave Residences

Maximum Construction Noise (dBA Leq)			70
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	81	81	
Excavation (Site Preparation)	85	75	
Foundation Construction	85	85	
Building Construction	76	75	
Paving	81	81	
Average Construction Noise (dBA Leq)			470
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	65	65	
Excavation (Site Preparation)	69	59	
Foundation Construction	69	69	
Building Construction	60	59	
Paving	65	65	

South - San Pascual Park

Maximum Construction Noise (dBA Leq)			110
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	77	77	
Excavation (Site Preparation)	81	71	
Foundation Construction	81	81	
Building Construction	72	71	
Paving	77	77	
Average Construction Noise (dBA Leq)			200
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	72	72	
Excavation (Site Preparation)	76	66	
Foundation Construction	76	76	
Building Construction	67	66	
Paving	72	72	

East - Arroyo Park

Maximum Construction Noise (dBA Leq)			40
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	86	86	
Excavation (Site Preparation)	90	80	
Foundation Construction	90	90	
Building Construction	81	80	
Paving	86	86	
Average Construction Noise (dBA Leq)			130
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	76	76	
Excavation (Site Preparation)	80	70	
Foundation Construction	80	80	
Building Construction	71	70	
Paving	76	76	

100 feet Reference Distance			
Maximum Construction Noise (dBA Leq)			100
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	78	78	
Excavation (Site Preparation)	82	72	
Foundation Construction	82	82	
Building Construction	73	72	
Paving	78	78	
Average Construction Noise (dBA Leq)			100
Construction Phase	**All Applicable Equipment in Use**[1]	**Minimum Required Equipment in Use**[1]	
Ground Clearing/Demolition	78	78	
Excavation (Site Preparation)	82	72	
Foundation Construction	82	82	
Building Construction	73	72	
Paving	78	78	

Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for the USEPA, December 31, 1971. Based on analysis for Office Building, Hotel, Hospital, School, and Public Works.

Construction Generated Vibration - San Rafael

North - San Rafael Ave Residences		Closest Distance (feet):	115
	Approximate RMS a 66	Approximate RMS 73.000	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.009	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.008	
	Criteria	0.250	
West - Aratina St Residences		Closest Distance (feet):	190
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.004	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.004	
	Criteria	0.250	
South - San Pascual Stables		Closest Distance (feet):	125
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.008	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.007	
	Criteria	0.250	
East - Arroyo Dr Residences		Closest Distance (feet):	360
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.002	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.250	

Based on distance to nearest structure

[1.] Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (2006).

Construction Generated Vibration - San Pascual

North - San Ramon Drive Residences		Closest Distance (feet):	65
	Approximate RMS a 66	Approximate RMS 73.000	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.021	
Small bulldozer	0.003	0.001	
Loaded trucks	0.076	0.018	
	Criteria	0.250	1700
West - San Pascual Ave Residences		Closest Distance (feet):	120
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.008	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.007	
	Criteria	0.250	
South - San Pascual Park		Closest Distance (feet):	630
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.250	
East - Arroyo Park		Closest Distance (feet):	80
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.016	
Small bulldozer	0.003	0.001	
Loaded trucks	0.076	0.013	
	Criteria	0.250	

Based on distance to nearest structure

[1.] Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (2006).

Appendix H

Traffic Evaluation

MEMORANDUM

To: Jillian Neary

From: Darlene Danehy Yellowhair, T.E., PTOE, RSP2i

Date: October 27, 2023

Subject: Arroyo Seco Water Reuse Project Traffic Evaluation

Introduction

This memorandum provides an evaluation of construction traffic expected to be generated by the Arroyo Seco Water Reuse Project (Project). The Project includes two sites - San Rafael (North Project) and San Pascual (South Project). The San Rafael site is located north of San Pascual Avenue and the San Pascual site is located south of San Pascual Avenue. Figure 1 shows the project location.

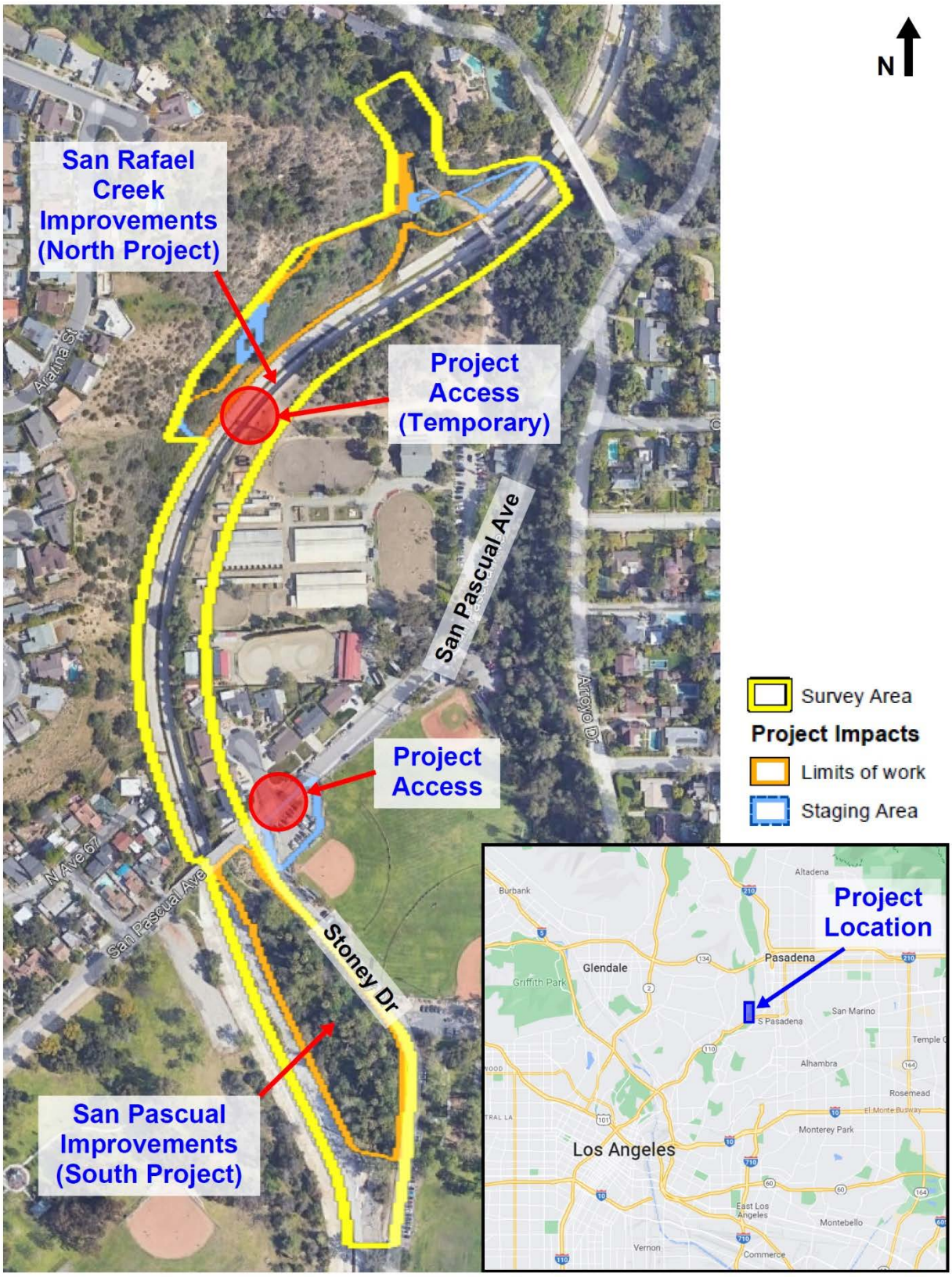
The Project will include construction of water treatment and expanded recreational facilities in the Lower Arroyo Seco but is not expected to generate any new permanent trips. Because the Project is not expected to result in a change in the permanent trip generation related to the Lower Arroyo Seco, a traffic analysis is not required. However, this memorandum provides a discussion of the anticipated construction traffic generated by the Project.

Project Construction Traffic

Construction Trip Generation

The Project is expected to include activities at two sites – San Rafael and San Pascual. Construction activity at each site is expected to include truck trips and worker trips, and each has a specified duration. On each workday, construction activities are expected to occur during an eight-hour period. It was assumed that truck trips would be evenly spaced throughout the workday, and that all workers would arrive during the same hour in the morning and would depart in the same hour in the afternoon/evening. Table 1 shows the total construction trips anticipated for the Project along with the duration of each activity. In terms of timeframe, as soon as the demolition, site preparation and grading/excavation at San Rafael Creek site is completed, the crew will be moving to the San Pascual site and will do same operations while the water infrastructure is under construction at the San Rafael Creek site. The total construction time for both sites is expected to be 17 months, including first 4 months at the San Rafael Creek site only, 5 months simultaneous construction at both sites, and 8 months at the San Pascual site only.

Figure 1. Project Location



Based on Table 1, the peak day occurs in the 8th month. Table 2 shows the peak day construction traffic along with the peak hour (on the peak day) construction traffic. As seen in the table, this conservative assumption would result in 57 daily construction trips, including 23 trips in the peak hour, in the 8th month.

Table 1. Total Construction Trips

San Rafael Creek Improvements (North Project)					
Month	**Activity**	**Total Trips**	**Work Days**	**Daily Trips**	**Peak Hour Trips**
1	Demolition	6	20	Assume 2 trips on 3 consecutive days	0
2	Site Preparation	200	20	10	1
3-4	Grading/Excavation	400	40	10	1
5-8	Water Infrastructure Construction	4	80	Assume 4 trips in same day	1
9	Paving	0	20	0	0
Construction Worker Trips - Per Day Rates Only				20	10
San Pascual Improvements (South Project)					
Month	**Activity**	**Total Trips**	**Work Days**	**Daily Trips**	**Peak Hour Trips**
5	Demolition	0	20	0	0
6-7	Site Preparation	400	40	10	1
8-10	Grading/Excavation	800	60	13	2
11-16	Water Infrastructure Construction	10	120	Assume 2, 2, 1 trip in single days distributed through phase	0
17	Paving	0	20	0	0
Construction Worker Trips - Per Day Rates Only				20	10

Table 2. Peak Day Construction Trips (8th Month)

Components	Activity	Total Trips	Work Days	Daily Trips	Peak Hour Trips
San Rafael Creek	Water Infrastructure Construction	4	80	4	1
	Construction Worker Trips - Per Day Rates			20	10
San Pascual	Grading	800	60	13	2
	Construction Worker Trips - Per Day Rates			20	10
			Peak Day	**57**	**23**

Per the Pasadena Department of Transportation's *Transportation Impact Analysis Current Practice and Guidelines (2015)*, any project which is expected to generate fewer than 300 new permanent daily trips is considered exempt, is not expected to generate any impacts, and does not require a full traffic analysis.

As previously discussed, the Project is not expected to generate any permanent trips. Similarly, the Project is also not expected to result in a permanent increase in daily VMT. Therefore, no analysis is required and the Project is not expected to have a significant impact due to long-term traffic. The City of Pasadena does not require evaluation of construction traffic.

Construction Trip Distribution

Construction debris, greenwaste, and excavated soil will be disposed at Scholl Canyon Landfill, approximately five miles from the Project sites. As shown in Figure 1, truck traffic for this Project is expected to access both sites from San Pascual Avenue. The northern project access will consist of a temporary bridge which will span the concrete channel. Trucks are expected to use Orange Grove Boulevard and State Route 134 as the major roadways to access the project area but will also have to travel along Madeline Drive and Arroyo Boulevard to access the Project site. Orange Grove Boulevard is an arterial roadway. Although it is closer to the site, State Route 110 is less likely to be used than State Route 134 due to weight restrictions.

Conclusion

As outlined in this memorandum, the Arroyo Seco Water Reuse Project is not expected to generate any new permanent traffic. Further, a conservative estimate of the construction traffic indicates that the Project will generate 57 trips on the peak day, below the City of Pasadena thresholds for requiring a traffic analysis. Therefore, the Project is expected to have a less than significant traffic impact.

Appendix I

Tribal Cultural Resources Supporting Documentation

DEPARTMENT OF PUBLIC WORKS

April 17, 2025

Sam Dunlap, Cultural Resources Director
GABRIELINO-TONGVA TRIBE
80839 Camino Santa Juliana
Indio, CA 92203

TongvaTCR@gmail.com

Subject: Assembly Bill 52 (Public Resources Code §21080.3.1): Proposed Arroyo Seco Water Reuse Project, City of Pasadena, Los Angeles County, California

Dear Mr. Dunlap:

The City of Pasadena (City), the lead agency pursuant to the California Environmental Quality Act (CEQA) for the proposed Arroyo Seco Water Reuse Project (Project), is preparing an Environmental Impact Report for the Project to analyze the environmental impacts of the Project, including those related to tribal cultural resources. The Project involves the diversion, treatment, and infiltration of stormwater runoff from the San Rafael tributary to the Arroyo Seco. The Project is divided into two discrete sites located on land immediately adjacent to the Arroyo Seco channel; the approximate 1.7-acre northern, San Rafael site and the approximate 2.5-acre southern, San Pascual site. These acreages include construction staging areas, where outside the primary Project footprint. Grading would be necessary to install the proposed water infrastructure and establish infiltration basins. The location of the Project is shown on the attached Exhibit 1, USGS 7.5-Minute Digital Quadrangle.

Pursuant to Assembly Bill (AB) 52 and Section 21080.3.1 of the California Environmental Quality Act (CEQA), and in response to your associated request, the City of Pasadena is hereby providing formal notification of the proposed Project. If you wish to begin consultation on this project pursuant to AB 52 and Sections 21080.3.1 and 21080.3.2 of CEQA, please request such consultation as soon as possible, but no later than thirty (30) days from the date of this letter. Please see my contact information below as the City's contact person for this project.

Christina Monde, P.E., Project Manager
100 N. Garfield Avenue, N306
Pasadena, CA 91101
(661) 510-6981
cmonde@cityofpasadena.net

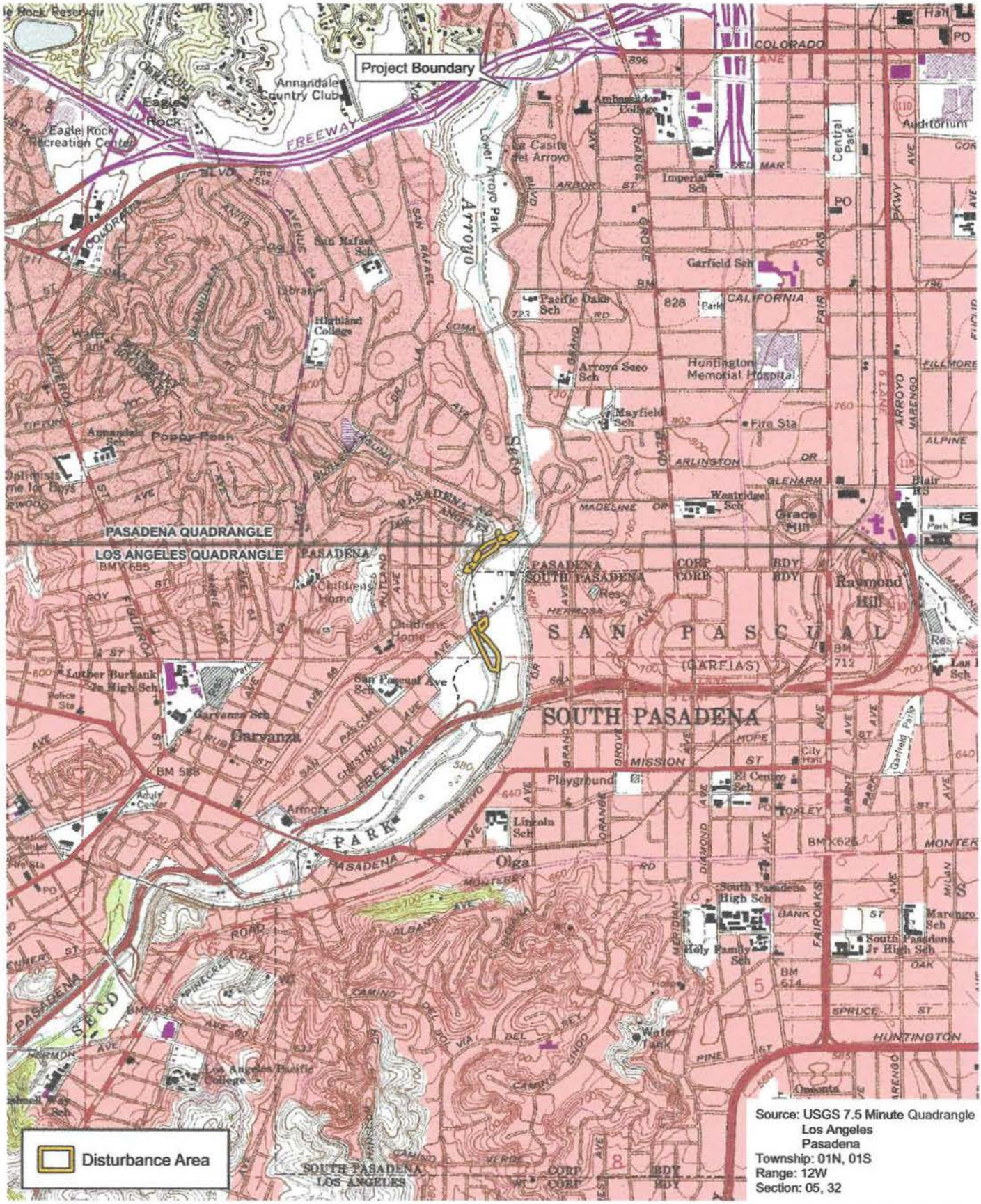
Your comments and concerns are important to the City and we welcome the opportunity to consult with the Gabrielino-Tongva Tribe, upon your request. If you have any questions regarding the project, please do not hesitate to contact Christina Monde at the contact information noted above. If you have any concerns or questions about this request for consultation, please contact the City's environmental coordinator John Bellas, at jbel-contractor@cityofpasadena.net. Thank you very much for your assistance.

Sincerely,

Christina Monde

Attachment
Exhibit 1, USGS 7.5-Minute Digital Quadrangle

cc: file



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USGS 7.5-Minute Digital Quadrangle

Exhibit 1

Arroyo Seco Water Reuse

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

(Rev: 3-14-2023 JVR) R:\Projects\PAS_Pasaden\3PAS010750\Graphics\Cultural\ex_USGS_Topo.pdf

DEPARTMENT OF PUBLIC WORKS

April 17, 2025

Andrew Salas, Chairman admin@gabrielenoindians.org
GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION
P.O. Box 393
Covina, CA 91723

Subject: **Assembly Bill 52 (Public Resources Code §21080.3.1): Proposed Arroyo Seco Water Reuse Project, City of Pasadena, Los Angeles County, California**

Dear Mr. Salas:

The City of Pasadena (City), the lead agency pursuant to the California Environmental Quality Act (CEQA) for the proposed Arroyo Seco Water Reuse (Project), is preparing an Environmental Impact Report for the Project to analyze the environmental impacts of the Project, including those related to tribal cultural resources. The Project involves the diversion, treatment, and infiltration of stormwater runoff from the San Rafael tributary to the Arroyo Seco. The Project is divided into two discrete sites located on land immediately adjacent to the Arroyo Seco channel; the approximate 1.7-acre northern, San Rafael site and the approximate 2.5-acre southern, San Pascual site. These acreages include construction staging areas, where outside the primary Project footprint. Grading would be necessary to install the proposed water infrastructure and establish infiltration basins. The location of the Project is shown on the attached Exhibit 1, USGS 7.5-Minute Digital Quadrangle.

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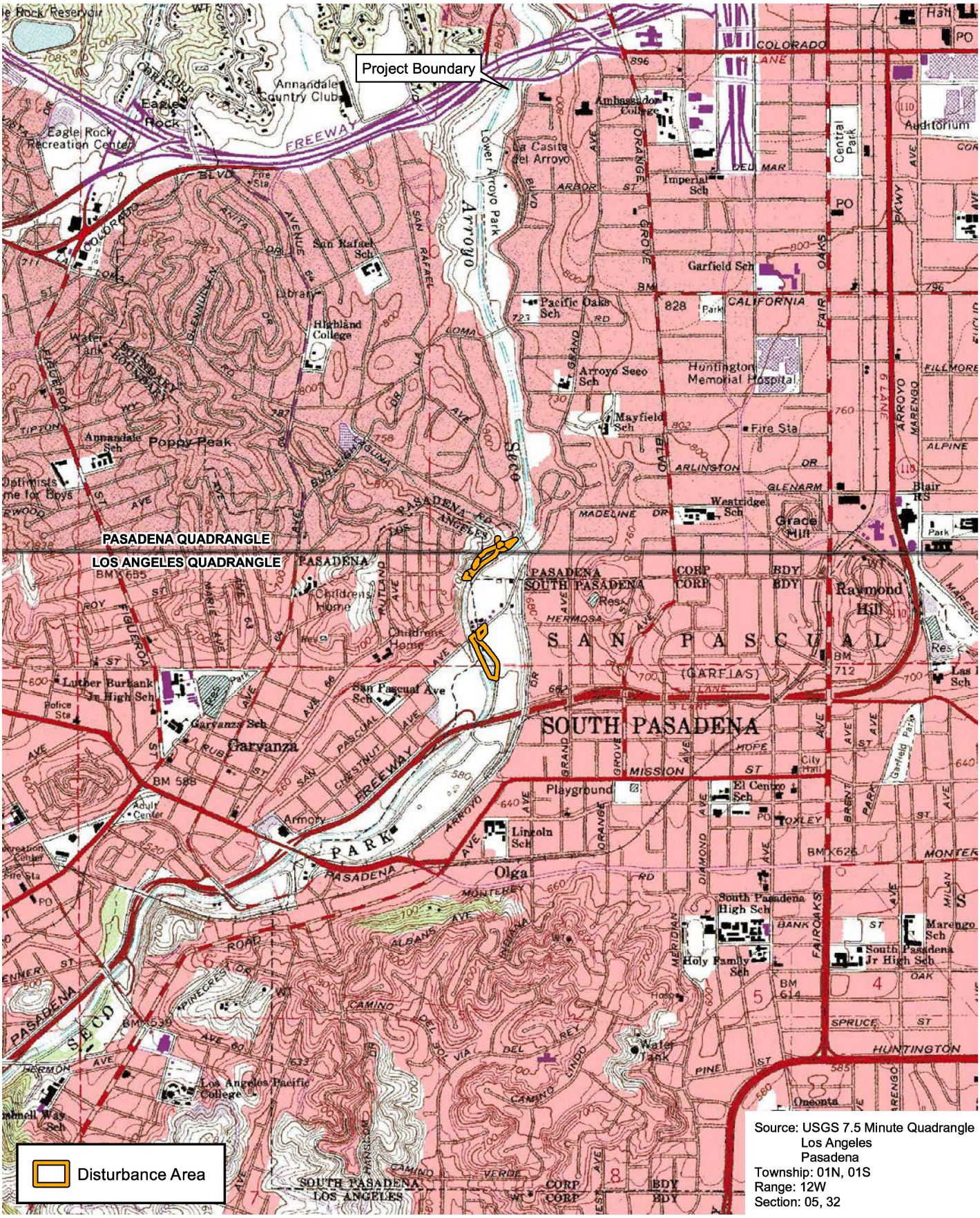
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N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

(Rev: 3-14-2023 JVR) R:\Projects\PAS_Pasaden\3PAS010750\Graphics\Cultural\ex_USGS_Topo.pdf

DEPARTMENT OF PUBLIC WORKS

April 3, 2023

Andrew Salas, Chairman
GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION
P.O. Box 393
Covina, CA 91723

admin@gabrielenoindians.org

Subject: Assembly Bill 52 (Public Resources Code §21080.3.1): Proposed Arroyo Seco Water Reuse and Natural Stream Restoration Project, City of Pasadena, Los Angeles County, California

Dear Mr. Salas:

The City of Pasadena (City), the lead agency pursuant to the California Environmental Quality Act (CEQA) for the proposed Arroyo Seco Water Reuse and Natural Stream Restoration Project (Project), is preparing an Initial Study/Mitigated Negative Declaration (IS/MND) for the Project to analyze the environmental impacts of the Project, including those related to tribal cultural resources. The Project involves the diversion, treatment, and infiltration of stormwater runoff from the San Rafael tributary to the Arroyo Seco. The Project is divided into two discrete sites located on land immediately adjacent to the Arroyo Seco channel; the approximate 1.7-acre northern, San Rafael site and the approximate 2.5-acre southern, San Pascual site. These acreages include construction staging areas, where outside the primary Project footprint. Grading would be necessary to install the proposed water infrastructure and establish infiltration basins. The location of the Project is shown on the attached Exhibit 1, USGS 7.5-Minute Digital Quadrangle.

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DEPARTMENT OF PUBLIC WORKS

April 3, 2023

Sam Dunlap, Cultural Resources Director
GABRIELINO-TONGVA TRIBE
80839 Camino Santa Juliana
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TongvaTCR@gmail.com

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