DRAFT ENVIRONMENTAL ASSESSMENT

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS HANGAR PROJECT

MONTGOMERY-GIBBS EXECUTIVE AIRPORT
SAN DIEGO, CALIFORNIA

Prepared for:

CITY OF SAN DIEGO

and

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As Lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

RECON Environmental, Inc.

March 2023

This Environmental Assessment becomes a federal document when evaluated, signed and dated by the responsible FAA Official.

Responsible FAA Official	**Date**

This page intentionally left blank

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains the Draft Environmental Assessment (EA) for the proposed San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (Proposed Action) at Montgomery-Gibbs Executive Airport. The Proposed Action analyzed in this environmental documentation includes the following: construction of approximately 32,000 square feet of prefabricated metal hangar buildings, an approximately 65,000-square-foot concrete apron, and parking and shelter for a single helitender and two fueling tender vehicles. The Proposed Action would also design and relocate existing utility connections (sewer, storm water, gas, water, power, etc.) within the main access roadway from Ponderosa Avenue and construct new storm water retention features. This document discloses the analysis and findings of the potential impacts of the Proposed Action, No Action and other reasonable alternatives in fulfillment of Federal Aviation Administration (FAA) policies and procedures relative to the National Environmental Policy Act (NEPA) and other related federal requirements.

BACKGROUND. The purpose of the Proposed Action is to provide at least 30,000 square feet of hangar space to meet the future needs of the AirOps fleet, which currently operates without any hangar space at Montgomery-Gibbs Executive Airport.

The public comment period for the Draft EA began on TBD when the Notice of Availability of the Draft EA was published in The *Daily Transcript* newspaper and on the City of San Diego's website to inform the general public, government agencies, and other interested parties.

WHAT SHOULD YOU DO? Read this Draft EA on this Proposed Action and provide comments, if applicable. Copies of the document are available for review at the City of San Diego Real Estate Assets Airports Division: 3750 John J. Montgomery Drive, San Diego, CA 92123 and Serra Mesa-Kearny Mesa Library: 9005 Aero Drive, San Diego, CA 92123. Copies of the document are also available for review online at [City to Provide]. If you have important information you believe has not been considered in this document or comments about the conclusions you may submit your written comments by letter to the following address:

City of San Diego
Public Works Department
ATTN: Juan Baligad
525 B Street, Suite 750, MS908A
San Diego, CA 92101

The cutoff date for comment submission is TBD, not later than 5:00 PM – Pacific Standard Time. Please allow enough time for mailing. City of San Diego must receive your comments by the deadline, not simply postmarked, by that date.

WHAT HAPPENS AFTER THIS? The FAA and the City of San Diego will revise the Draft EA, as necessary, in response to comments received on the Draft EA, and prepare the Final EA. Following the release of the Final EA, the FAA will either issue a Finding of No Significant Impact or decide to prepare an Environmental Impact Statement.

Before including your name, address and telephone number, email or other personal identifying information in your comment, be advised that your entire comment–including your personal identifying information–may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

This page intentionally left blank

1.0 PURPOSE AND NEED

1.1 Introduction

The City of San Diego (City) proposes to construct Phase II of the San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (Proposed Action) at Montgomery-Gibbs Executive Airport (MYF), located in the city of San Diego, California. The Proposed Action would support Phase I of the AirOps Facility Project that was completed in November 2019. Phase I consisted of interior remodeling and tenant improvements of the existing AirOps building. Phase II would provide 30,000 square feet of helicopter hangars and support facilities to make the AirOps building improved under Phase I a fully operational fleet center for SDFR's helicopters and rapid fire response. The City recently completed a multimillion-dollar remodel of the former Flight Service Station (FSS) building, converting it into an operational AirOps station for SDFR.

The City, which owns and operates MYF, prepared this Environmental Assessment (EA) for the portion of the Airport Layout Plan (ALP)[1] that depicts the Proposed Action, and is seeking conditional approval from the Federal Aviation Administration (FAA) pursuant to 49 United States Code (U.S.C.) § 40103(b), 44718, and 47107(a)(16), and Title 14 Code of Federal Regulations (CFR) Part 77 and Part 157. The Proposed Action includes construction of permanent helicopter hangars and support facilities at MYF. A detailed description of the Proposed Action is provided in Section 1.4.

This EA has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA) as amended (42 U.S.C. § 4321, *et seq.*); the Council on Environmental Quality Regulations (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR §§ 1500-1508); and the Airport and Airway Improvement Act of 1982, as amended (Public Law 97-248). This EA has also been prepared in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, and other federal, state, and local requirements. This EA is intended to identify and consider potential environmental impacts related to the Proposed Action. The FAA is the lead federal agency and is responsible for ensuring compliance with NEPA.

1.2 Background

MYF is located within the Kearny Mesa Community Planning Area of the city of San Diego, California and is bounded by State Route 163 to the west, Balboa Avenue to the North, Aero Drive to the South, and a mix of commercial and office development to the east. MYF (initially known as Gibbs Field) was established in 1937 by William Gibbs and was used to train U.S. Army Air Corps cadets. MYF began to operate as public-use airport when the City purchased Gibbs Field in 1947.

MYF has two parallel runways (10L-28R and 10R-28L) oriented in a northwest/southeast alignment, and a crosswind runway (5-23) oriented in a northeast/southwest alignment. MYF also has one helipad. General aviation aircraft that operate at MYF include private, corporate, charter, air ambulance, law enforcement, fire rescue, flight training and cargo. MYF does not cater to air carrier or military aviation requirements. The FAA publishes the annual Terminal Area

[1]FAA issued a conditional approval of the ALP on November 6, 2019.

Forecast (TAF) for each airport in the federal system. TAF data is reported based on the FAA fiscal year, which is October through September. The 2018 TAF contains aircraft operations and passenger enplanement data for MYF for the years 2018 through 2050. For purposes of this EA, the forecast years represent the year in which the Proposed Action is expected to be implemented (2026) and a five-year outlook after implementation (2031).

Table 1. MYF Aviation Forecasts (2026 through 2031)

Fiscal Year	Itinerant Operations	Local Operations	Total Operations
2026	113,709	189,123	302,832
2027	113,741	189,691	303,432
2028	113,773	190,260	304,033
2029	113,805	190,831	304,636
2030	113,837	191,404	305,241
2031	113,869	191,979	305,848

1.3 Proposed Action

The Proposed Action would construct permanent helicopter hangars and support facilities at MYF. The proposed construction would occur in the northeastern corner of the airport. Regional and Airport Boundary maps are provided in Figures 1 and 2, respectively. The area of temporary and permanent disturbance would consist of a 3.72-acre site east of Taxiway Charlie and the Taxiway Safety Area, located adjacent to the Air Traffic Control Tower between the FAA lease area, the Runway Object Free Area (ROFA), and the Runway Protection Zone (RPZ) for the northwest approach to Runway 5/23 (Figure 3). Project construction would be limited to the 3.72-acre project footprint to avoid impacts to additional natural areas and avoid interference with runway operations. Consequently, the Proposed Action would not have a pre-defined temporary staging area, but would utilize various staging areas during the phased construction process in order to limit construction activities to the 3.72-acre project footprint. Entry to the site would be provided via an asphalt road accessed from a security gate located off Ponderosa Avenue.

The Proposed Action is depicted on Figure 4 and includes the following project components:

- Construct an approximately 32,000 square feet prefabricated metal hangar which would contain a hangar support area for maintenance offices, over-haul, avionics, and storage rooms.

- Construct an approximately 65,000-square-foot concrete apron, to accommodate five helicopters.

- Construct parking and shelter for a single helitender and two fueling tender vehicles.

- Relocate existing utility connections (sewer, storm water, gas, water, power, etc.) within the main access roadway from Ponderosa Avenue. Relocations would consist of trenching within the existing main access roadway and repaved. All relocation activities would be confined to the existing main access roadway and would not affect natural soils surrounding the main access roadway.

- Repair and resurface the main access roadway from Ponderosa Avenue to the FAA Air

Traffic Control Tower and the new AirOps facility.

- Install storm water retention features that would capture runoff from the proposed improvements and an existing parking pad adjacent to the southern project boundary. The Proposed Action would route all runoff from new impervious areas into a proposed permanent modular wetland for water quality and then into a proposed underground storage system for detention of the 100-year peak volumes. The modular wetland and underground storage system would be constructed as a part of the project. Captured peak runoff volumes from the six-hour, 100-year storm event would be pumped and hauled off for discharge into an acceptable Municipal Separate Storm Sewer System that meets the requirements of the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266.

SDFR currently operates three helicopters: two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk. The proposed hangars are intended to accommodate these three existing helicopters, as well as one additional Lockheed Martin/SikorksyS70i Firehawk and one additional Bell 412. The project is anticipated to be awarded as a Design/Build contract, with a 12-month design phase and a 14-month construction phase. The total cost of the Proposed Action would be approximately $23,000,000. Additionally, mitigation for project impacts on vernal pools is anticipated to begin at the City's vernal pool mitigation bank in calendar year 2023 and achieve final success criteria and final agency sign off in calendar year 2028.

In the future condition, the Bell 412 helicopters would take off and land with tower approval from the existing concrete parking pad, while the Lockheed Martin/SikorskyS70i Firehawks would taxi from the proposed hangars along Taxiway Charlie to take off from Runway 5/23. The Lockheed Martin/SikorskyS70i Firehawks would also land at Runway 5/23 and taxi back to the proposed hangars along Taxiway Charlie.

1.4 Purpose and Need

According to FAA Order 1050.1F, Section 6-2.1(c), the Purpose and Need statement briefly describes the underlying purpose and need for the federal action and provides the foundation for identifying reasonable alternatives to a Proposed Action. The Purpose and Need statement identifies the problem facing the airport sponsor and the proposed solution to the problem. The City of San Diego developed this Purpose and Need statement incorporating FAA's statutory mission to ensure the safe and efficient use of navigable airspace in the United States as well as the Airport Sponsor's goals and objectives.

The purpose of the Proposed Action is to provide hangar space to the SDFR AirOps at MYF that would be fully compatible with the existing operations building. AirOps is a 24/7, 365-day operating facility with no current hangar space at MYF to support these operations. The San Diego Fire Department Hangar Feasibility Study concluded that 30,000 square feet of hangar space is required to meet future needs of the AirOps fleet (Atkins 2017). FAA's need is to ensure that the Airport operates in a safe manner pursuant to 49 U.S.C. § 47101(a)(1) and defined by the statutory requirement to decide whether to approve the Proposed Action as depicted on the Airport Layout Plan (ALP) developed by the Authority, pursuant to 49 U.S.C. § 47107(a)(16).

1.5 Requested Federal Action

The federal action that is the subject of this EA is the following:

- Conditional approval of the portion of the ALP that depicts the Proposed Action pursuant to 49 U.S.C. § 40103(b), 44718, and 47107(a)(16), and 14 CFR Part 77 and Part 157.

1.6 Document Organization

The format and content of this EA conforms to the requirements of 40 CFR § 1502.10. This EA is organized into the following chapters:

Chapter 1: Purpose and Need – Provides a brief description of the airport, Proposed Action, and purpose and need for the project.

Chapter 2: Alternatives – Identifies alternatives to the Proposed Action and applies screening criteria to determine which alternatives should be carried forward for further environmental analysis.

Chapter 3: Affected Environment – Describes the study area and existing land use and demographic conditions.

Chapter 4: Environmental Consequences and Avoidance and Minimization – Discusses environmental impacts, mitigation measures, and compares the impacts associated with the Proposed Action, other alternative actions, and the No-Action Alternative.

Chapter 5: Agency and Public Involvement – Describes the coordination and public involvement associated with the EA process. This chapter also presents a list of federal, state, and local agencies and other interested parties that have been involved in EA coordination efforts.

Chapter 6: List of Preparers

Chapter 7: References

Chapter 8: List of Abbreviations and Acronyms

Project Location

RECON

M:\JOBS5\9078\common_gis\fig1_EA.mxd 2/16/2023 fmm

FIGURE 1
Regional Location

This page intentionally left blank

Image Source: Nearmap (flown January 2023)

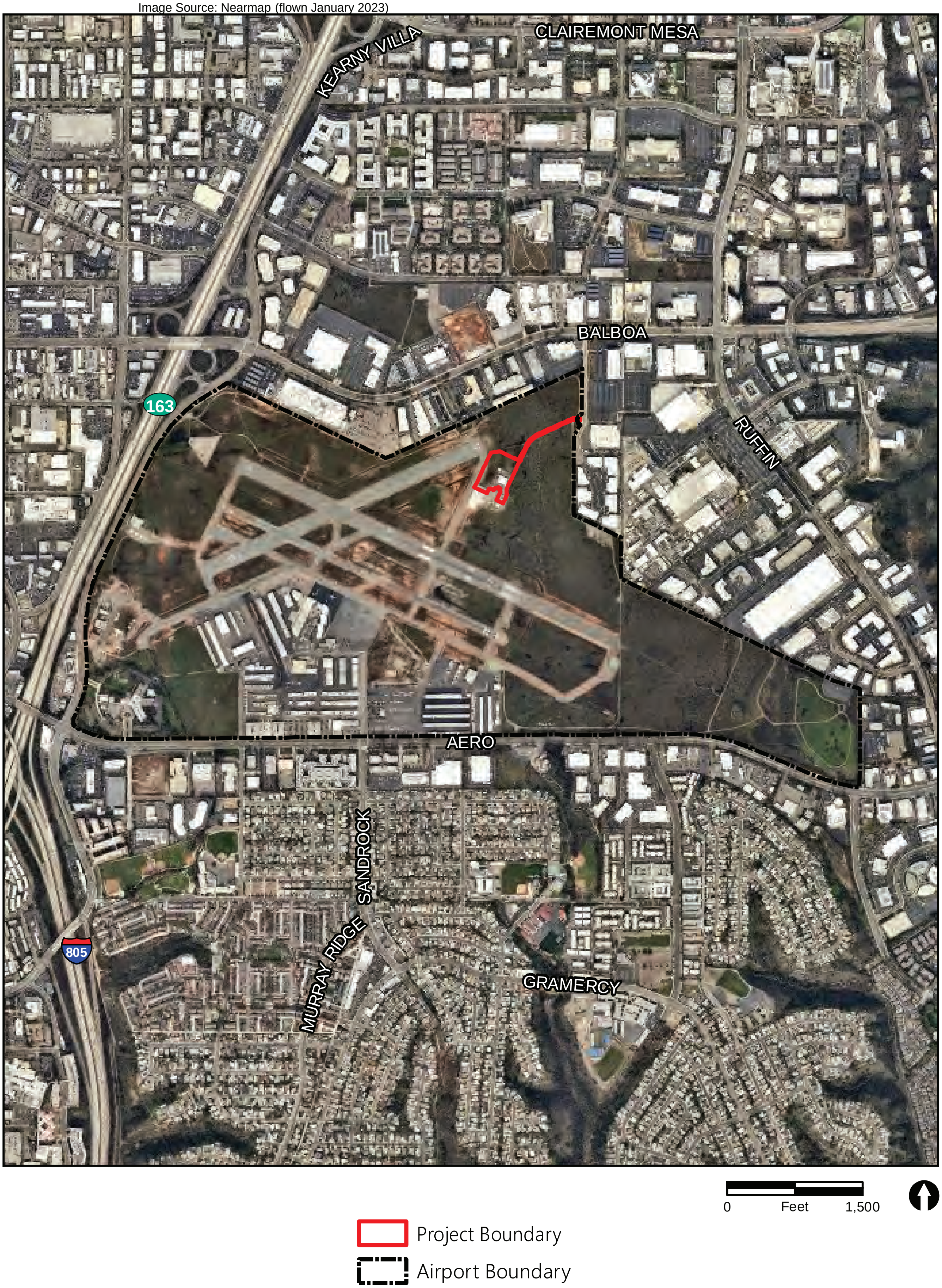


FIGURE 2
Airport Boundary

RECON

M:\JOBS5\9078\common_gis\fig2_EA.mxd 2/16/2023 fmm

This page intentionally left blank

Image Source: Nearmap (flown January 2023)

Proposed Action Footprint

FIGURE 3

Proposed Action Footprint

RECON

M:\JOBS5\9078\common_gis\fig3_EA.mxd 2/16/2023 fmm

This page intentionally left blank

Map Source: City of San Diego

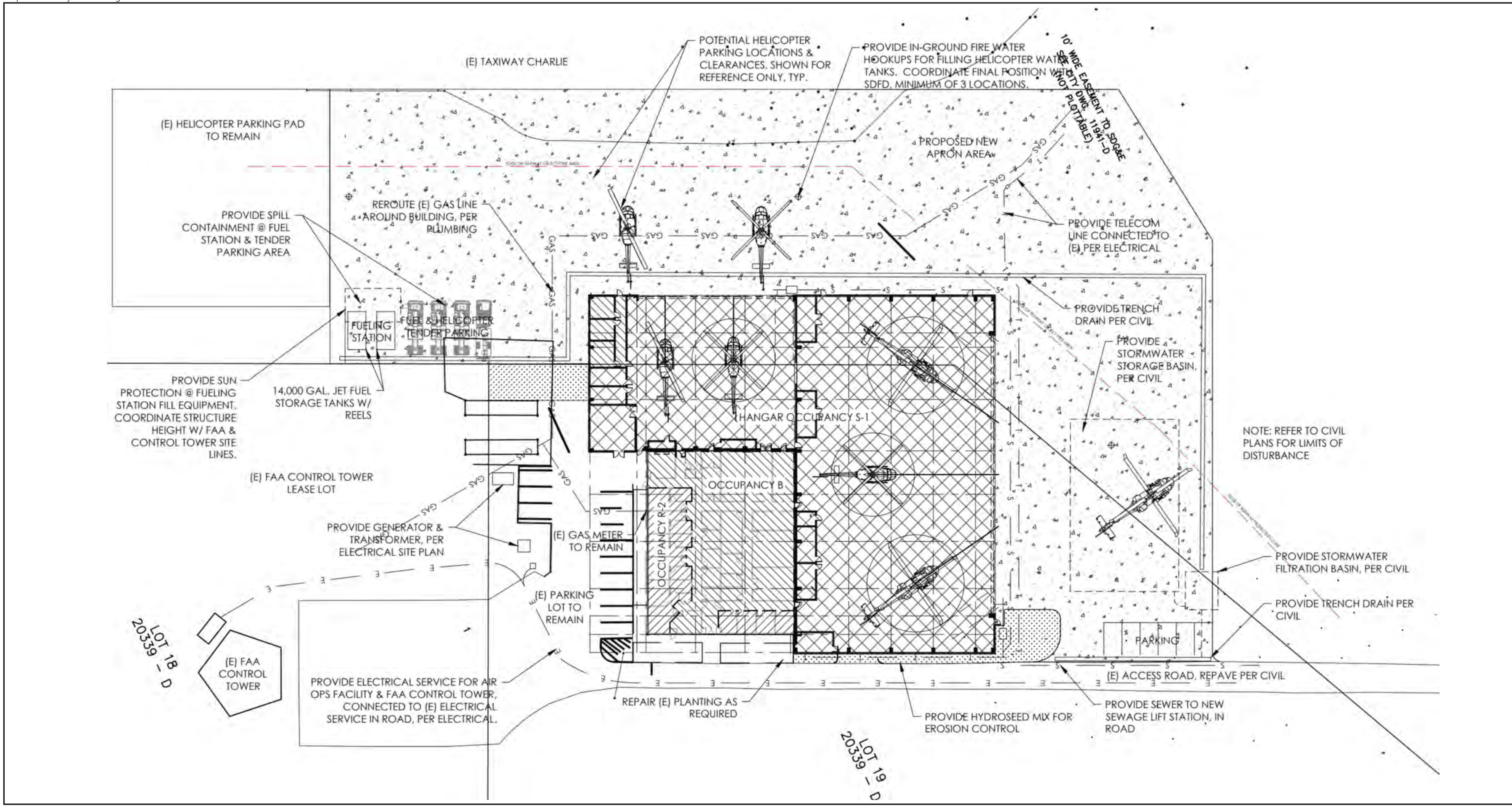


FIGURE 4
Site Plan

RECON
M:\JOBS5\9078\env\graphics\EA\fig4_EA.afdesign 02/23/22 bma

This page intentionally left blank

2.0 ALTERNATIVES

2.1 Introduction

The objective of this alternatives analysis is to identify reasonable alternatives that accommodate the purpose and need identified in Chapter 1. Once identified, each alternative is evaluated in terms of its ability to satisfy the objectives of the purpose and need for the project and its technical feasibility. The results of this evaluation are to determine which alternatives will be considered reasonable and practicable, thereby warranting further consideration.

CEQ regulations (40 CFR § 1502.14), regarding implementation of the NEPA, require that Federal agencies perform the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives which were eliminated from detailed study, briefly discuss the reasons for having been eliminated;
- Devote substantial treatment to each alternative considered in detail, including the Proposed Action, so that reviewers may evaluate their comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency; and
- Include the alternative of No Action.

As stated in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, alternatives can be eliminated from further consideration when the alternatives do not fulfill the purpose and need for the action or cannot be reasonably implemented. As discussed above, CEQ §1502.14(c) requires the evaluation of the No Action alternative regardless of whether it meets the stated purpose and need or is reasonable to implement.

2.2 Alternative Screening Process

The purpose of the Proposed Action (see Section 1.4.1) is to provide at least 30,000 square feet of hangar space to meet the future needs of the AirOps fleet, which currently operates without any hangar space at MYF. Based on the project purpose and need, a screening process was formulated for the alternatives under consideration.

Reasonable alternatives to the Proposed Action, including the No-Action Alternative, were identified and evaluated in this EA in accordance with NEPA, CEQ guidance, and FAA guidance and policy.

2.3 Alternatives Considered But Eliminated

The City went through an iterative analysis that developed the following five design options in the study area:

- Option A utilized a ‘stacked’ hangar configuration that would allow four helicopters to be arranged in a stacked or staggered pattern in the hangar. Since there is at least one helicopter on alert parked on the apron, the fifth location would be empty most of the time and only used during inclement weather. Hangars designed for Option A were located along the northern and western sides of the FSS building.

- Option B utilized a stacked hangar configuration, but the hangar was placed north of the FSS building, facing west. Because of the hangar dimensions, this orientation works better for hangar/apron operations, but does not face the direction preferred by SDFR. Due to the unique characteristics of the proposed site, the long axis of the hangar works best if oriented along the long axis of the site, which, in this case, is roughly north and south. Option B is unsuitable for implementation because the northwest portion of the hangar encroaches into the ROFA. Therefore, Option B was eliminated.

- Option C utilized a stacked hangar configuration, and the hangar would be located within the footprint of the FSS building, facing west. Under Option C, the FSS building would be demolished and reconstructed in another location, and a new Operations structure would be constructed in an area just north of the hangar. This configuration would free up additional space for parking and support activities, and would not encroach into the ROFA. Additionally, construction within the footprint of the FSS building would shift the hangar further southeast, reducing the potential for Air Traffic Control Tower line of sight obstructions. However, Option C was considered infeasible because it would require demolition and reconstruction of the AirOps building improved under Phase I. Demolition and reconstruction of the AirOps building improved under Phase I would represent an unnecessary financial expenditure and disruption of AirOps operations. Therefore, Option C was eliminated.

- Option D utilized a single-file hangar configuration that illustrates the tightness of the site and the problems of siting such a hangar configuration. This configuration could never be used in a north orientation since the long axis of the hangar could not fit within the short axis of the site. Due to the length (328 feet), it takes up a large portion of the proposed site, Option D also could not fit in an east/west orientation (hangar door facing north), and would require demolition and reconstruction of the AirOps building improved under Phase I. Demolition and reconstruction of the AirOps building improved under Phase I would represent an unnecessary financial expenditure and disruption of AirOps operations. Therefore, Option D was eliminated.

- Option E utilized a stacked hangar configuration, with the hangar door facing north. Similar to Option C, the hangar would be located within the footprint of the FSS building, and a new Operations structure would be constructed in an area just north of the hangar However, there is limited space for such a structure, and it would likely have to be two stories to provide the square footage required. Consequently, Option E was considered infeasible because the two-story building would block line of site from the air traffic control tower to the taxiway and runway, as well as of approach of aircraft. Therefore, Option E was eliminated.

As described above, Options B through E were eliminated, and an updated version of Option A was ultimately selected as the Proposed Action.

2.4 Alternatives Given Further Consideration

2.4.1 Proposed Action Alternative

The Proposed Action is described in detail in Section 1.3. The Proposed Action would achieve the purpose and need of the project by providing at least 30,000 square feet of hangar space to meet the futures needs of the AirOps fleet, which currently operates without any hangar space at MYF.

2.4.2 No Action Alternative

Under the No Action alternative, the approximately 32,000 square feet of prefabricated metal hangar buildings, the approximately 65,000-square-foot concrete apron, and the proposed parking and shelter for a single helitender and two fueling tender vehicles would not be constructed. Under the No Action alternative, the AirOps facility would continue to operate without any hangar space at MYF, and the City would still acquire one additional Lockheed Martin/SikorksyS70i Firehawk and one additional Bell 412. Additionally, the existing utility connections (sewer, storm water, gas, water, power, etc.) within the main access roadway from Ponderosa Avenue would not be designed and relocated, and the proposed storm water retention features would not be constructed.

2.5 Applicable Federal Laws and Executive Orders

In addition to complying with NEPA, the CEQ Regulations for Implementing NEPA, and FAA Orders 1050.1F and 5050.4B, the Proposed Action must comply with the following federal laws and executive orders, which are addressed in this EA as applicable.

- Airport and Airway Improvement Act of 1982, as amended (Public Law [P.L.] 97-248; 43 CFR §2640)
- Archaeological and Historic Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-291, 16 U.S.C. §469)
- Clean Air Act of 1977 (as amended) (42 U.S.C. §7409 et seq.)
- Coastal Zone Management Act (16 U.S.C. §1451-1464; P.L. 92-583)
- Comprehensive Environmental Response Compensation Liability Act (42 U.S.C. §9601; P.L. 96-510)
- Department of Transportation Act of 1966, as amended (P.L. 89-670)
- Federal Endangered Species Act (ESA) of 1973 (P.L. 85-624; 16 U.S.C. §§661, 664 note, 1008 note)
- Executive Order 11988 – *Floodplain Management*
- Executive Order 11990 – *Protection of Wetlands*
- Executive Order 12088 – *Federal Compliance with Pollution Control Standards*
- Executive Order 12898 – *Environmental Justice*
- Farmland Protection Policy Act (P.L. 97-98; 7 CFR Part 658)
- National Historic Preservation Act of 1966 Section 106, (16 U.S.C. §470[f]; P.L. 89-665)

- Noise Control Act of 1972 (P.L. 92-574; 42 U.S.C. §4901)
- Water Pollution Control Act, as amended by the Clean Water Act (CWA) of 1977 (33 U.S.C. §1251 et seq.)
- Wild and Scenic Rivers Act, as amended (16 U.S.C. §1271 et seq.; P.L. 90-542)

3.0 AFFECTED ENVIRONMENT

This chapter describes the existing physical, natural, and human environmental conditions within those areas that would be directly, or indirectly, affected by the project alternatives. The information describes the airport environs and provides information by which potential environmental impacts of the alternatives retained for detailed evaluation can be assessed and compared. The environmental resource categories are organized as identified in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

As outlined within FAA Order 5050.4B, paragraph 706.f.49 concise analyses were undertaken only for potential impacts that the alternatives under consideration may cause. The following resources were evaluated but are excluded from detailed analysis in the Draft EA because it was determined that these resources do not occur within the study area or would not be directly or indirectly impacted by the project alternatives.

- Coastal Resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Historical, Architectural, Archeological, and Cultural Resources
- Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources: Floodplains
- Water Resources: Wild and Scenic Rivers

Table 2 presents the results of the analysis that determined that these resources do not occur within the study area or would not be directly or indirectly impacted by the project alternatives.

Table 2. Resource Categories Not Affected

Resource Categories	Analysis
Coastal Resources	The Proposed Action site is located approximately seven miles east from the Pacific Ocean and is not located within the Coastal Zone Boundary established for San Diego County under the Coastal Zone Management Program.
Department of Transportation Act, Section 4(f)	There are no Section 4(f) resources on or immediately adjacent to the Proposed Action site. As described in Section 3.10.1 below, three historic addresses have been recorded within the one-mile search radius, but none of these are located within the Proposed Action site. Three publicly owned parks are located 0.5 mile or greater south of the Proposed Action site, beyond the MYF airport boundary.
Farmlands	The Proposed Action does not involve land acquisition or the conversion of agricultural land to airport use. The airport was established in 1937 by William Gibbs (initially known as Gibbs Field) and was used to train U.S. Army Air Corps cadets. The airport has been operating as public-use airport since the City purchased Gibbs Field in 1947. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) classifies the Proposed Action site as “Urban and Built Up Land” and “Other Land” (USDA NRCS 2018). Because the airport land is not considered “farmland,” was developed prior to 1984, and is committed to urban development, the provisions of the Farmland Protection Policy Act do not apply.
Historical, Architectural, Archeological, and Cultural Resources	A Historical Resources Survey was prepared for the Proposed Action (RECON Environmental, Inc. [RECON] 2022) (Appendix B). A records search utilizing a one-mile radius buffer surrounding the 6.5-acre Area of Potential Effect (APE) was completed by the South Coastal Information Center at San Diego State University on June 15, 2018. The record search determined that 43 cultural resources investigations have been completed within a one-mile radius of the APE. The record search also identified three recorded historic-era cultural resources, one prehistoric cultural resource, and one prehistoric isolated artifact within a one-mile radius of the APE. The historic resources consist of industrial and commercial buildings. The prehistoric resource consists of a lithic and shell scatter. None of these previously recorded cultural resources are present within the APE. A total of three historic addresses have been recorded within the one-mile search radius, none of which are within the APE. A field survey of the APE was conducted on June 13, 2018, by RECON archaeologist Harry Price accompanied by Kaci Brown, a Native American representative from Red Tail Environmental. The field survey did not identify any cultural material within the APE. Large patches of reddish sandstone and cobble lenses cover the ground surface in much of the Survey Area. The APE has been scraped in the past, probably for the initial brushing of the area, exposing subsoils. Numerous broken cobbles were noted on the surface. The cobbles were likely broken as a result of past scraping and mowing and/or from natural fracturing. Surface gravel and small amounts of concrete and asphalt pieces were in the area between the existing control tower and the runway. The large parking pad at the southwest end of the Survey Area was not surveyed, nor was the taxilane along the western edge of the Survey Area, because the ground surface is covered by either asphalt or concrete in both these locations. The possibility of significant historical resources being present within the APE is considered low. The topsoil within the APE has been scraped away in the past, leaving no suitable areas where potentially significant prehistoric or historic cultural resources could be present.

Table 2. Resource Categories Not Affected

Resource Categories	Analysis
Land Use	The Proposed Action site and MYF are located within a highly urbanized area in the southern portion of the Kearny Mesa Community Plan in the city of San Diego. The Kearny Mesa Community Planning Area is located approximately six miles east of the Pacific Ocean and 18 miles north of Tijuana, Baja California, Mexico. This community is a major industrial and commercial center, with nearby land uses mostly compatible with the airport. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist less than one mile north of the Proposed Action site, about one mile southwest of Runway 5, south of the airport property, and less than two miles west of the departure end of Runway 28R. MYF has been operating as public-use airport since the City purchased Gibbs Field in 1947. The majority of the Proposed Action site consists of undeveloped vegetated land that is regularly mowed as part of airport maintenance activities. The Proposed Action site also includes developed land associated with the existing Airport facilities. Planned and future land uses in the vicinity of the Proposed Action site consist of future projects identified in the MYF Airport Master Plan listed in Section 4.4, Cumulative Effects.
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	The Proposed Action site is within the existing airfield and does not support residences or commercial activity. As described in Section 3.2, MYF is located in a highly urbanized industrial and commercial community and is surrounded by a mix of commercial, office, and industrial uses on all sides. The Proposed Action site is located within the San Diego County (West Central)–San Diego City (Central/Clairemont and Kearny Mesa) Public Use Microdata Area (PUMA). U.S. Census data indicates that the ethnic makeup of the San Diego City (Central/Clairemont & Kearny Mesa) PUMA consists primarily Non-Hispanic White (52.1 percent), followed by lower percentages of Hispanic or Latino Origin (24.4 percent), Asian and Pacific Islander (14.5 percent), Black or African American (5.2 percent), two or more races, (3.2 percent), Native American (0.5 percent), and other race (0.2 percent). In comparison, the San Diego County reported a lower percentage of Non-Hispanic White residents (45.1 percent) and higher percentages of Hispanic or Latino origin residents (34.0 percent). The percentage of Asian and Pacific Islander (12.2 percent), and Black or African American (4.8 percent), and Native American (0.4 percent) were slightly lower. The percentage of two or more races (3.5 percent) was slightly higher, while the percentage of other race (0.2 percent) was the same (U.S. Department of Commerce 2018). In terms of income comparisons, slightly more residents in the San Diego City (Central/Clairemont and Kearny Mesa) PUMA (13 percent) were below the poverty level compared to the county (11.4 percent) (U.S. Department of Commerce 2018). The estimated median household income was $84,666 for the San Diego City (Central/Clairemont and Kearny Mesa) PUMA, which was higher than the median household income for the county ($79,079) (U.S. Department of Commerce 2018). Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to determine whether a Proposed Action would result in environmental health risks and safety risks that may disproportionately affect children. The closest school is Angier Elementary School, located beyond the MYF airport boundary and approximately one mile

Table 2. Resource Categories Not Affected

Resource Categories	Analysis
	southwest of the Proposed Action site. The Proposed Action site currently supports helicopter operations, and the Proposed Action would support continued helicopter operations. Therefore, the Proposed Action would not introduce new uses that would increase risk to children. The airport property is fenced. Helicopter flight operations would utilize approved landing and departure paths that are approved by MYF and FAA, which took child safety into consideration during their development.
Visual Effects	Sources of existing lighting in the vicinity include lighting at MYF and lighting associated with nighttime commercial, residential, and local roads in the surrounding area. Existing airport lighting at MYF consists of runway lighting, approach lighting, and apron lighting to allow for aircraft activities. The Proposed Action site and surrounding areas do not currently have lighting. The Proposed Action would introduce blue light-emitting diode (LED) lighting consisting of a combination of pavement and elevated edge lighting. This lighting would be consistent with other light sources located throughout MYF and would be consistent with the existing visual character of the airport. The visual character of MYF consists of runways and airport facilities, surrounded by undeveloped vegetated land that is regularly mowed as part of airport maintenance activities. MYF is located within the Kearny Mesa Community Planning Area, which is a highly urbanized industrial and commercial community within the city of San Diego. MYF is surrounded by a mixed commercial, office, and industrial uses on all sides. Due to the flat topography and surrounding urban development, direct views of the Proposed Action site are either not provided or are partially obscured. Views from adjacent parcels are obscured by fencing, and what is visible of the Proposed Action site appears as existing airport facilities and surrounding undeveloped vegetated land.
Water Resources: Floodplains	Executive Order 11988, *Floodplains Management*, directs Federal agencies to take actions to "reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." The FAA's policies and procedures for implementing this executive order are contained in U.S. Department of Transportation (USDOT) Order 5650.2, *Floodplain Management and Protection.* The executive order and the USDOT order establish a policy to avoid taking an action within a 100-year floodplain where practicable. Figure 5 shows that the entire MYF, including the Proposed Action site, is located outside the Federal Emergency Management Agency (FEMA) mapped one-percent and 0.2-percent annual chance floodplains (FEMA 2012). The floodplains nearest to MYF are associated with the Murray Canyon Creek south of Aero Drive, and Murphy Canyon Creek, east of Murphy Canyon Road. Both of these floodplains are located beyond the MYF airport boundary (City of San Diego 2017).
Water Resources: Wild and Scenic Rivers	According to the National Rivers Inventory, the closest wild and scenic river to the Proposed Action site is an 8.1-mile segment of Palm Canyon Creek, which is located approximately 65 miles away.

3.1 Air Quality

This analysis incorporates the results of the Air Quality Analysis prepared for the Proposed Action (RECON 2023a) (Appendix C). The Proposed Action site is located within the San Diego Air

Basin (SDAB). The SDAB is currently classified as a federal non-attainment area for ozone (O_3), and a state non-attainment area for particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and ozone.

Air quality is commonly expressed as the number of days in which air pollution levels exceed the California Ambient Air Quality Standards (CAAQS) set by the California Air Resources Board (CARB) or National Ambient Air Quality Standards (NAAQS) set by the U.S. Environmental Protection Agency. The San Diego Air Pollution Control District (SDAPCD) maintains 10 air quality monitoring stations located throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used by scientists to help forecast daily air pollution levels.

The San Diego–Kearny Villa monitoring station located at 6125A Kearny Villa Road, approximately two miles north of the Proposed Action site, is the nearest station to the Proposed Action site. The Kearney Villa monitoring station measures ozone, nitrogen dioxide (NO_2), PM_{10}, and $PM_{2.5}$. Table 3 provides a summary of measurements collected at the San Diego–Kearny Villa monitoring station for the years 2017 through 2021.

Table 3. Summary of Air Quality Measurements Recorded at the San Diego – Kearny Villa Air Quality Monitoring Station

Pollutant/Standard	2017	2018	2019	2020	2021
Ozone					
Max. 1-hr (ppm)	0.097	0.102	0.083	0.123	0.095
Days State 1-hour Standard Exceeded (0.09 ppm)	2	1	0	2	1
Federal Max 8-hr (ppm)	0.083	0.077	0.075	0.102	0.071
Days 2008 Federal 8-hour Standard Exceeded (0.075 ppm)	4	1	0	6	0
Days 2015 Federal 8-hour Standard Exceeded (0.070 ppm)	6	5	1	10	1
State Max 8-hr (ppm)	0.084	0.077	0.076	0.102	0.072
Days State 8-hour Standard Exceeded (0.07 ppm)	6	5	1	12	2
Nitrogen Dioxide					
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Days Federal 1-hour Standard Exceeded (0.100 ppm)	0	0	0	0	0
Max 1-hr (ppm)	0.054	0.045	0.046	0.052	0.060
Annual Average (ppm)	0.009	0.008	0.008	0.007	0.007
PM10*					
State Max. Daily ($\mu g/m^3$)	47.0	38.0	--	--	--
Measured Days State 24-hour Standard Exceeded (50 $\mu g/m^3$)	0	0	0	0	--
Calculated Days State 24-hour Standard Exceeded (50 $\mu g/m^3$)	0.0	0.0	--	--	--
State Annual Average ($\mu g/m^3$)	17.6	18.4	--	--	--
Federal Max. Daily ($\mu g/m^3$)	46.0	38.0	--	--	--
Measured Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$)	0	0	0	0	--
Calculated Days Federal 24-hour Standard Exceeded (150 $\mu g/m^3$)	0.0	0.0	--	--	--
Federal Annual Average ($\mu g/m^3$)	17.6	18.4	--	--	--
PM2.5*					
State Max. Daily $\mu g/m^3$)	27.5	32.2	15.0	--	--
State Annual Average ($\mu g/m^3$)	8.0	8.3	--	--	--

Table 3. Summary of Air Quality Measurements Recorded at the San Diego – Kearny Villa Air Quality Monitoring Station

Pollutant/Standard	2017	2018	2019	2020	2021
Federal Max. Daily ($\mu g/m^3$)	27.5	32.2	16.2	47.5	20.9
Measured Days Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	0	0	0	2	0
Calculated Days Federal 24-hour Standard Exceeded (35$\mu g/m^3$)	0.0	0.0	0.0	5.8	0.0
Federal Annual Average ($\mu g/m^3$)	7.9	8.3	7.0	8.7	7.6

SOURCE: CARB 2023.

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; -- = Not available.

*Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

3.2 Biological Resources

This section incorporates the results of the Biological Resource Report prepared by the City Engineering and Capital Projects Department (City of San Diego 2020) (Appendix D). Surveys for the study area were performed by qualified City biologists. A number of surveys were performed, including a biological reconnaissance survey, a general habitat assessment with vegetation mapping, a focused plant survey, protocol fairy shrimp surveys, vernal pool assessment, hydrology assessment, and a general jurisdictional wetlands and waters assessment. The dates and personnel of all these surveys are provided in the Biological Resource Report completed for the Proposed Action (City of San Diego 2020) (Appendix D).

On November 2, 2018, the U.S. Fish and Wildlife Service (USFWS) provided the FAA with a list of threatened and endangered species that may occur in the Proposed Action site, and/or may be affected by the Proposed Action (Table 4). On November 22, 2019, FAA initiated informal Section 7 consultation with USFWS for Proposed Action. On March 17, 2020, the USFWS completed Section 7 consultation for Proposed Action and determined that the Proposed Action would be consistent with the City's Multiple Species Conservation Program (MSCP) Subarea Plan and would include all applicable conservation measures in the City's Subarea Plan to avoid and minimize potential adverse effects to the gnatcatcher (USFWS 2020). Through Section 7 consultation, USFWS also extended to the FAA an incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their incidental take permit for their Vernal Pool Habitat Conservation Plan (VPHCP).

Table 4. USFWS List of Threatened and Endangered Species

Name	Status
BIRDS	
California least tern (*Sterna antillarum browni)*	Endangered
Coastal California gnatcatcher (*Polioptila californica californica*)	Threatened
Least Bell's Vireo (*Vireo belli pusillus*)	Endangered
Light-footed clapper rail (*Rallus longirostris levipes)*	Endangered
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Endangered
Western snowy plover (*Charadrius nivosus nivosus*)	Threatened
CRUSTACEANS	
Riverside fairy shrimp (*Streptocephalus woottoni*)	Endangered
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	Endangered
FLOWERING PLANTS	
California Orcutt Grass (*Orcuttia californica)*	Endangered
Salt Marsh Bird's-beak (*Cordylanthus maritimus ssp. Maritimus*)	Endangered
San Diego Ambrosia (*Ambrosia pumila*)	Endangered
San Diego Button-celery (*Eryngium aristulatum var. parishii*)	Endangered
San Diego Mesa-mint (*Pogogyne abramsii*)	Endangered
San Diego Thornmint (*Acanthomintha ilicifolia*)	Threatened
Spreading Navarretia (*Navarretia fossalis*)	Threatened
Willowy Monardella (*Monardella viminea*)	Endangered
CRITICAL HABITATS	
San Diego Fairy Shrimp (*Branchinecta sandiegonensis*)	Final
Spreading Navarretia (*Navarretia fossalis*)	Final

SOURCE: USFWS 2020

3.2.1 Vegetation Communities and Sensitive Plants

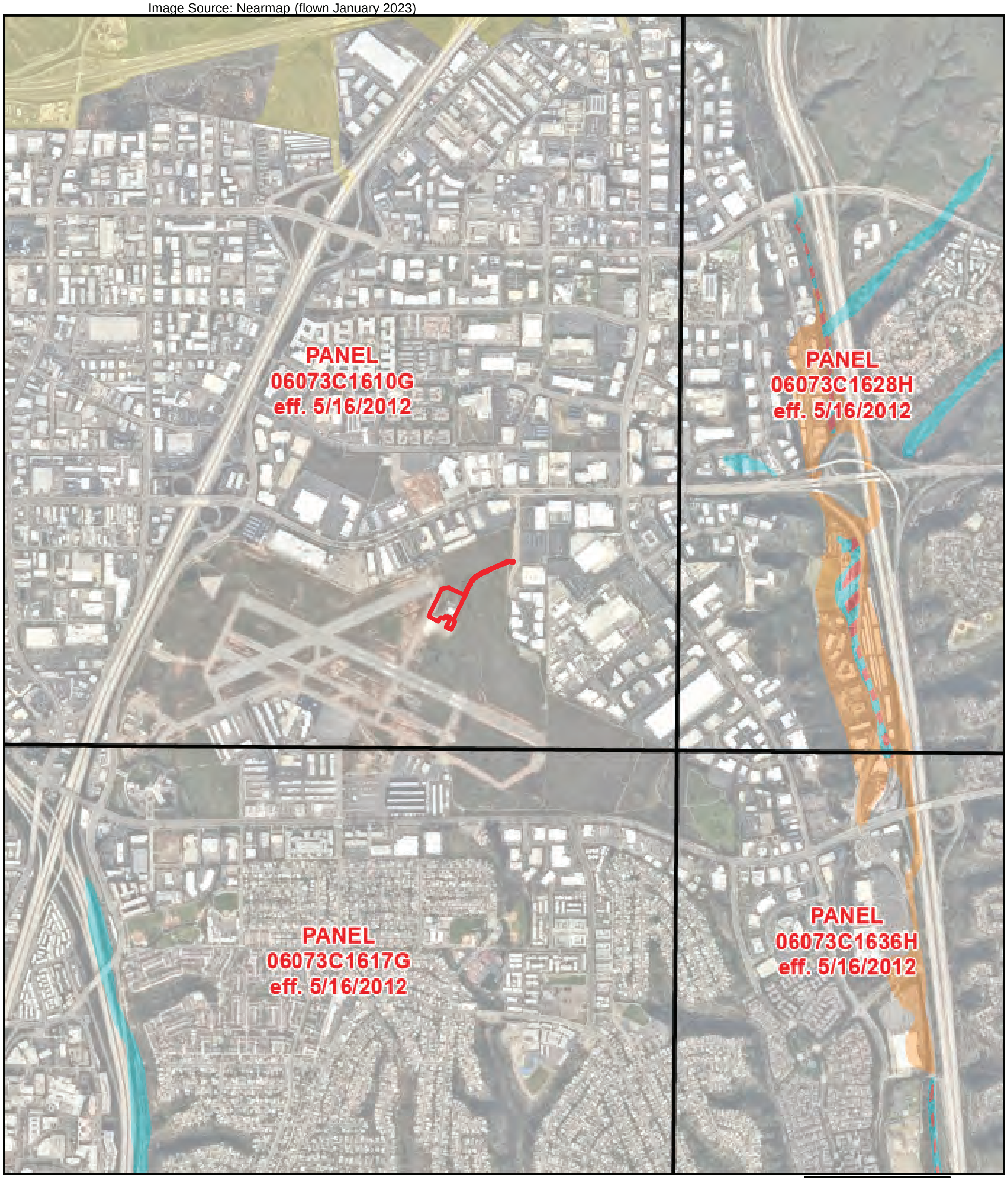
The biological resources study area encompasses the Proposed Action site and a 100-foot survey buffer area around the Proposed Action site, totaling 11.694 acres (Figure 6). Vegetation communities within the biological resources study area consist of Diegan coastal sage scrub, Non-native grassland, San Diego mesa hardpan vernal pool, Disturbed Habitat, and Developed Land (see Figure 6). One sensitive plant species, San Diego mesa mint (*Pogogyne abramsii*), was detected within the vegetation study area (Figure 7). Descriptions of these vegetation communities and sensitive plant species, as well as a complete list of plant species encountered during the field survey, are provided in the Biological Resource Report completed for the Proposed Action (City of San Diego 2020). The northeastern portion of the site overlaps with Critical Habitat for spreading navarretia (*Navarretia fossalis*), a federally threatened species, as designated by the United States Fish and Wildlife Service. The 100-foot survey buffer overlaps with Critical Habitat for San Diego fairy shrimp (*Branchinecta sandiegonensis*) (see Figure 7).

3.2.2 Sensitive Wildlife

Two sensitive wildlife species and/or their suitable habitat were identified during the field survey in the biological resources study area (Figure 7). San Diego fairy shrimp was observed within the 100-foot survey buffer and within San Diego mesa hardpan vernal pools within the Proposed

Action site (City of San Diego 2018). Coastal California gnatcatcher (*Polioptila californica californica*) is known to occur at MYF and is typically found in the south/southeastern area of the airport. One California gnatcatcher was briefly observed during a site visit approximately 100 feet east of the Proposed Action site. Descriptions of these sensitive wildlife species, as well as a complete list of wildlife species encountered during the field survey, are provided in the Biological Resource Report completed for the Proposed Action (City of San Diego 2020).

Image Source: Nearmap (flown January 2023)



Proposed Action Footprint

FIRM Panels

Flood Hazard Zones*

1% Annual Chance Flood Hazard

Regulatory Floodway

Special Floodway

Area of Undetermined Flood Hazard

0.2% Annual Chance Flood Hazard

* Source: FEMA's National Flood Hazard Layer (NFHL)

RECON

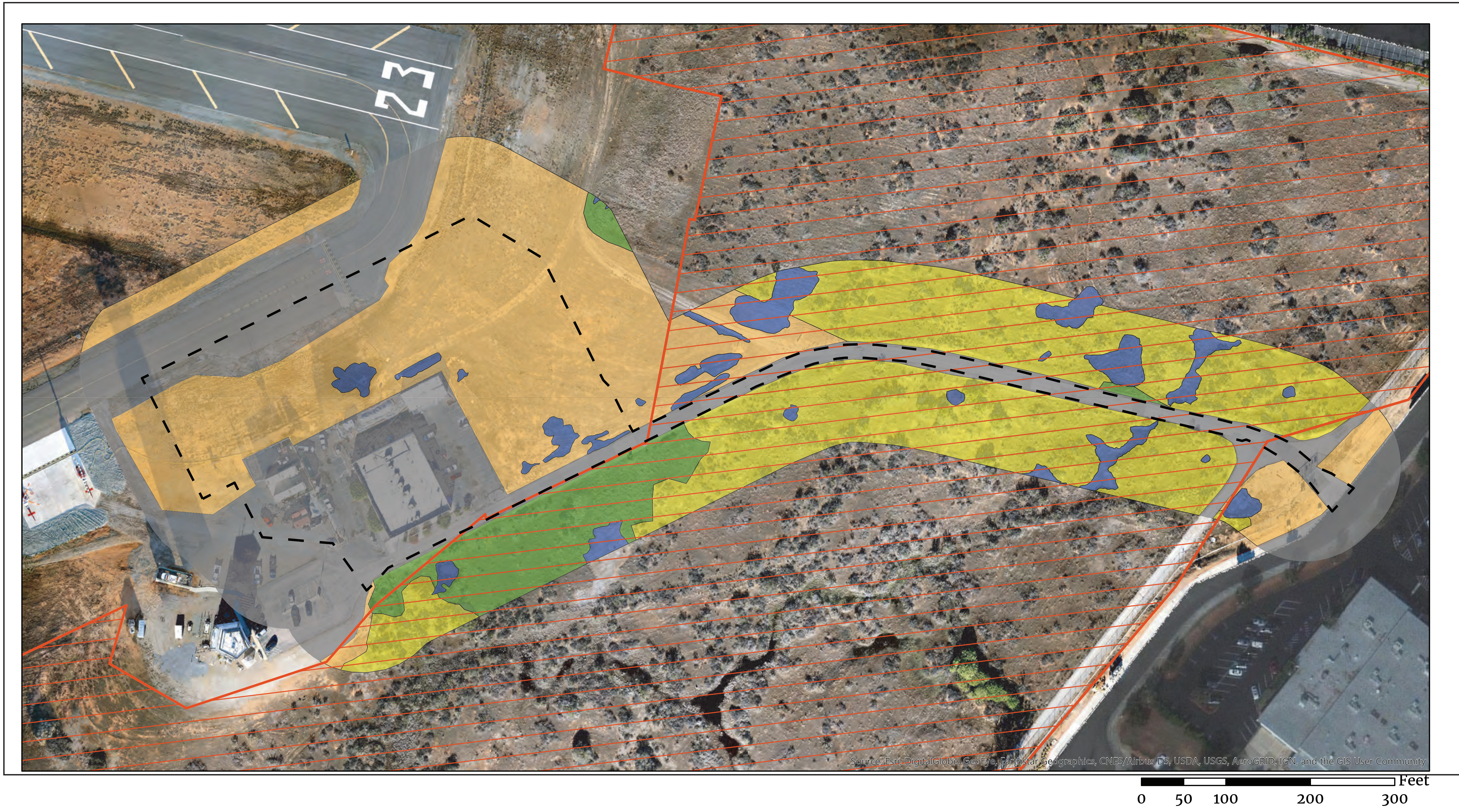
FIGURE 5

FEMA Flood Zones

M:\JOBS5\9078\common_gis\fig5_EA.mxd 2/28/2023 fmm

This page intentionally left blank

Map Source: City of San Diego



RECON

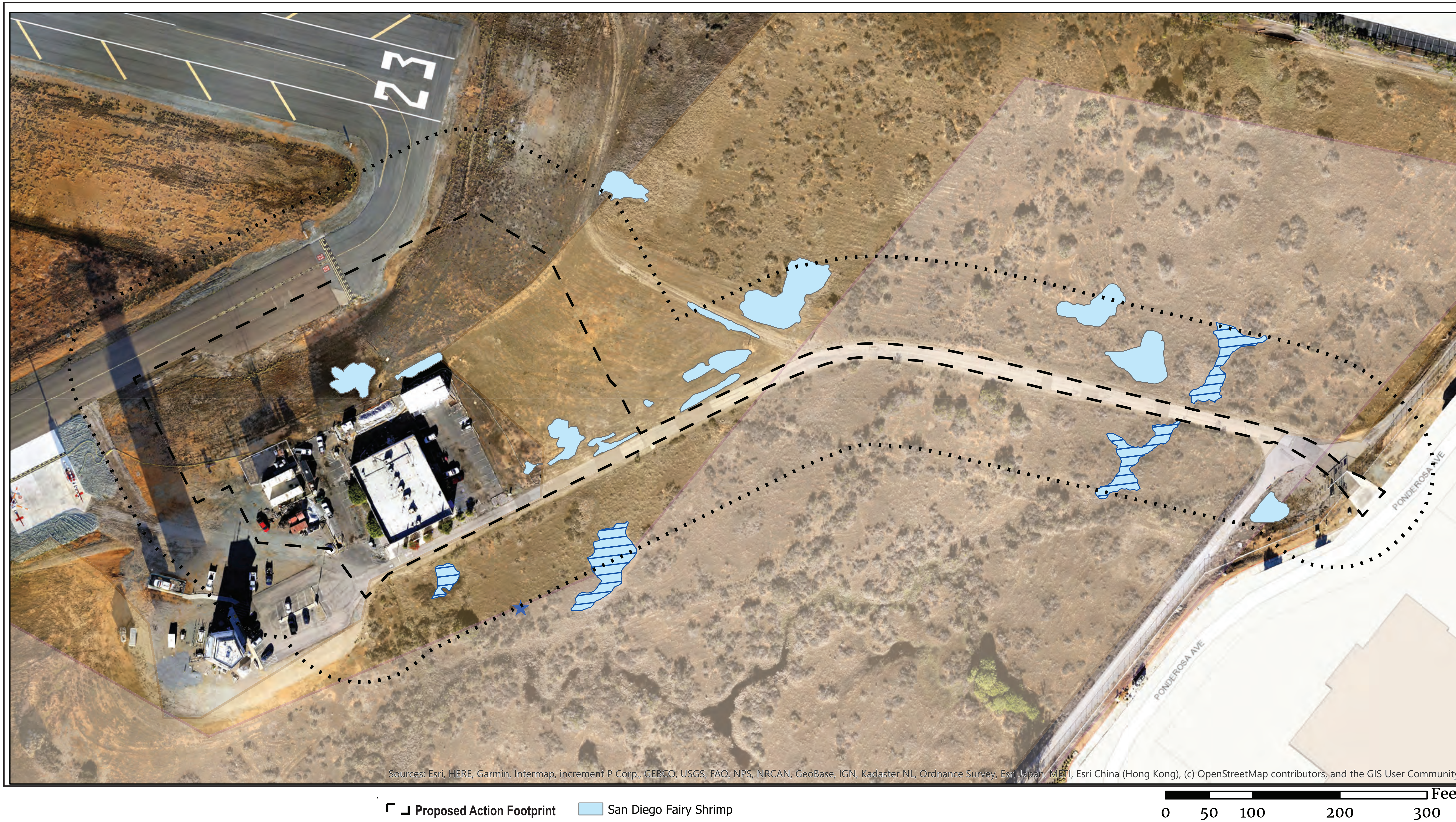
M:\JOBS5\9078\env\graphics\EA\fig6_EA.ai 02/28/23 fmm

FIGURE 6

Vegetation Communities within the Proposed Action Footprint and 100-foot Survey Area

This page intentionally left blank

Map Source: City of San Diego



Proposed Action Footprint

100-Foot Survey Limit

Sensitive Species Observed

San Diego Mesa Mint

California Gnatcatcher

San Diego Fairy Shrimp

USFWS Critical Habitat

San Diego Fairy Shrimp Critical Habitat

Spreading Navarretia Critical Habitat

RECON

M:\JOBS5\9078\env\graphics\EA\fig7ai 02/28/23 fmm

FIGURE 7

Sensitive Species Locations within the Proposed Action Footprint and 100-foot Survey Area

This page intentionally left blank

3.3 Climate

The Proposed Action site is located in the Kearny Mesa Community Planning Area of the city of San Diego, which is within SDAB that encompasses all of San Diego County. A possible concern is the potential impact of the Proposed Action on climate change. Greenhouse gases (GHGs) are those that trap heat in the Earth's atmosphere. Increasing concentrations of GHGs in the atmosphere affect global climate. Both naturally occurring and anthropogenic (man-made) GHGs include water vapor and carbon dioxide (CO_2). All GHG inventories measure CO_2 emissions. Beyond CO_2, different inventories include different GHGs such as methane (CH_4), nitrous oxide (NO_X), and ozone. GHGs are primarily from combustion of fossil fuels, decomposition of waste materials, and deforestation and are linked to an increase in the earth's average temperature by means of a phenomenon called the greenhouse effect. Research has shown that there is a direct link between fuel combustion and GHG emissions. Therefore, sources that require fuel or power at an airport are the primary sources that would generate GHGs. These sources include aircraft, auxiliary power units (turbine engines), ground support equipment (combustion engines such as aircraft tugs, air start units, loaders, tractors fuel or hydrant trucks), stationary/area sources (combustion sources such as boilers, heaters, generators, and non-combustion sources such as fuel storage tanks and painting operations), ground access vehicles, construction equipment, electrical usage, refrigerants, and waste.

The CARB performs statewide GHG inventories. The inventory is divided into nine broad sectors of economic activity: agriculture, commercial, electricity generation, forestry, high global warming potential (GWP) emitters, industrial, recycling and waste, residential, and transportation (including aviation). Emissions are quantified in million metric tons of CO_2 equivalent (MMT CO_2E). Table 5 shows the estimated statewide GHG emissions for the years 1990, 2017, and 2020. Although annual GHG inventory data is available for years 2000 through 2019, the years 1990, 2017, and 2020 are highlighted in Table 5 because 1990 is the baseline year for established reduction targets, 2017 correspond to the same years for which baseline year operations data are available for MYF, and 2020 is the most recent data available.

Table 5. California GHG Emissions by Sector

Sector	1990[1] Emissions in MMT CO_2E (% total)[2]	2017[3] Emissions in MMT CO_2E (% total)[2]	2020[3] Emissions in MMT CO_2E (% total)[2]
Electricity Generation	110.5 (25.7%)	62.3 (14.7%)	59.8 (16.2%)
Transportation	150.6 (35.0%)	175.6 (41.4%)	139.9 (37.9%)
Industrial	105.3 (24.4%)	100.3 (23.6%)	85.3 (23.1%)
Commercial	14.4 (3.4%)	23.4 (5.5%)	22.0 (6.0%)
Residential	29.7 (6.9%)	30.4 (7.2%)	30.7 (8.3%)
Agriculture & Forestry	18.9 (4.4%)	32.5 (7.7%)	31.6 (8.6%)
Not Specified	1.3 (0.3%)	--	--
Total[4]	**430.7**	**424.5**	**369.3**

SOURCE: CARB 2007 and 2022.

[1]1990 data was obtained from the CARB 2007 source and are based on Intergovernmental Panel on Climate Change (IPCC) fourth assessment report GWPs.

[2]Percentages may not total 100 due to rounding.

[3]2017 and 2020 data was retrieved from the CARB 2022 source and are based on IPCC fourth assessment report GWPs.

[4]Totals may vary due to independent rounding.

Aviation emissions are included in the transportation sector. Aviation emissions totaled 4.7 MMT CO_2E in 2017 and 2.9 MMT CO_2E in 2020, which represents 1.1 percent and 0.8 percent of the total inventory for those respective years. Baseline year 2017 emissions for 2017 were estimated to be 29,495 metric tons of CO_2 equivalent (MT CO_2E) (or approximately 0.03 MMT CO_2E).

3.4 Hazardous Materials, Solid Waste, and Pollution Prevention

Review of the California Department of Toxic Substances Control (DTSC) Envirostor Database (DTSC 2020) and State Water Resources Control Board (SWRCB) Geotracker Database (SWRCB 2020) determined that there are no listed hazardous materials sites located on the Proposed Action Site. All DTSC Envirostor Database (DTSC 2020) and SWRCB Geotracker Database (SWRCB 2020) listings within MYF are identified as closed. There are several active hazardous materials sites located within 0.5 mile of the Proposed Action site, but these sites are located outside of the MYF boundary. Additionally, review of the United States Environmental Protection Agency Superfund database determined that the only site within San Diego County currently listed on the National Priorities List (NPL) is United States Marine Corps Base Camp Pendleton, located approximately 30 miles northwest of the Proposed Action Site (EPA 2020).

3.5 Natural Resources and Energy Supply

The Proposed Action site supports existing aviation use areas. Energy demand generated by aviation uses include aviation fuel and electricity for business and ground support services, which is similar to energy demand generated at other general aviation airports. San Diego Gas & Electric is the energy supplier for MYF. Currently, MYF does not generate energy on-site.

3.6 Noise and Noise-Compatible Land Use

This analysis incorporates the results of the Noise Analysis prepared for the Proposed Action (RECON 2023b) (Appendix E). MYF is situated in a highly urbanized area in the southern portion of the Kearny Mesa Community Plan in the city of San Diego. This community is a major industrial and commercial center, with nearby land uses mostly compatible with the airport. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist less than one mile north of the project area north of Tech Way, about one mile southwest of Runway 5, south of the airport property, and less than two miles west of the departure end of Runway 28R. Noise levels in the vicinity of the airport are expected to increase in the future, primarily due to a projected increase in aircraft operations. In addition, the fleet is expected to shift to a higher proportion of business jets and twin-engine turboprops and a lower proportion of single-engine piston aircraft.

The City is currently developing an airport master plan that will establish the long-term development plan for MYF. As a part of this process, the City has developed year 2017 noise contours. As shown in Figure 8, the Proposed Action site is located within the 65 and 60 Community Noise Equivalent Level (CNEL) noise contour for MYF. Additionally, SDFR currently operates three helicopters consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk.

Image Source: Nearmap (flown January 2023)

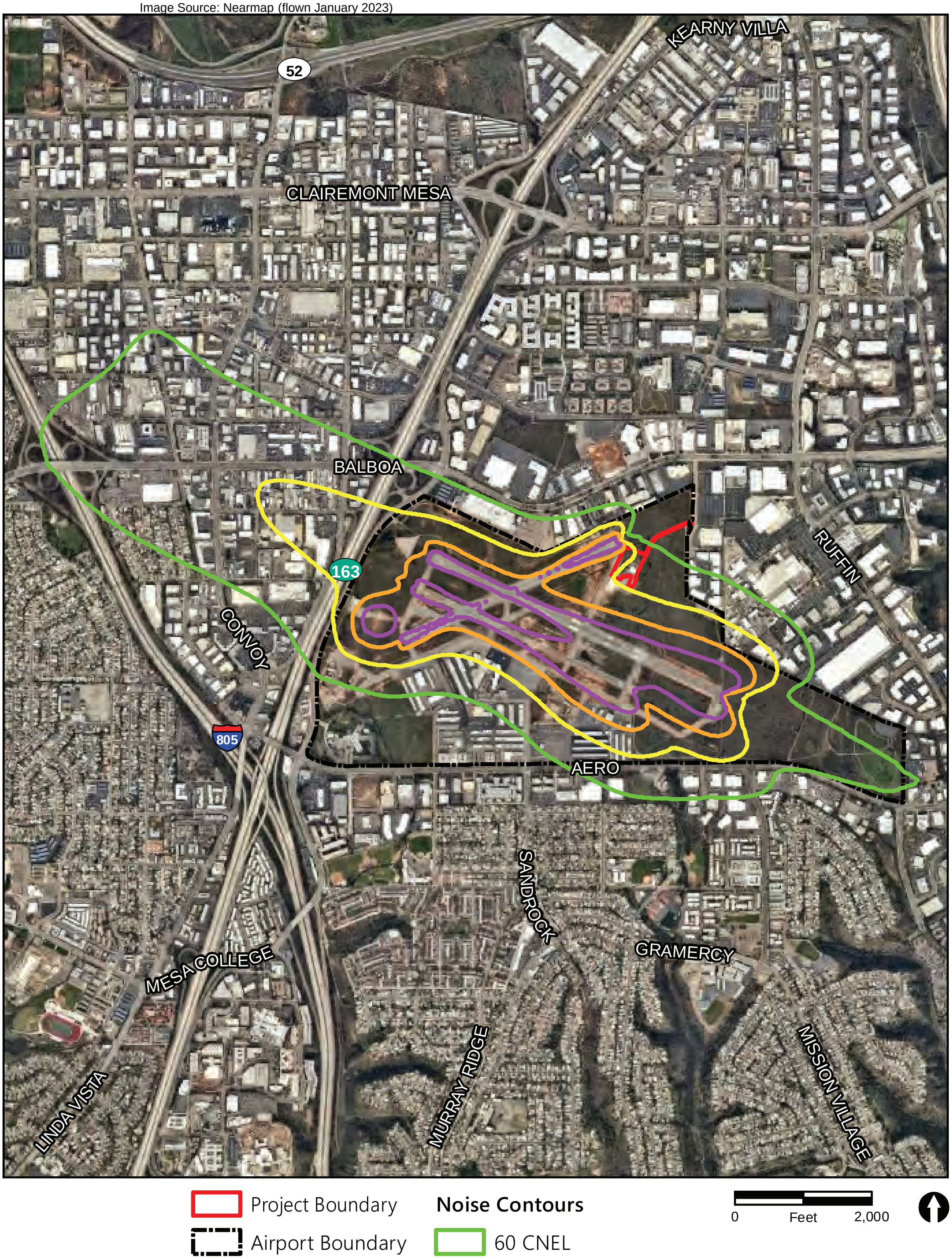


FIGURE 8
Baseline (2017) Master Plan Update Noise Contours

RECON

M:\JOBS5\9078\common_gis\fig8_EA.mxd 2/16/2023 fmm

This page intentionally left blank

3.7 Water Resources

This section covers wetlands and surface waters and groundwater. Floodplains and wild and scenic rivers are discussed in Table 2 above. Figure 9 presents the water resource study area that encompasses the Proposed Action site plus a 100-foot buffer around the main portion of the Proposed Action site (no buffer along the access road), totaling 7.98 acres. The water resource study area was developed as a part of the Jurisdictional Waters/Wetland Delineation Report and also encompasses the potentially affected area identified in the Storm Water Quality Management Plan (SWQMP).

3.7.1 Wetlands

This section incorporates information from the Jurisdictional Waters/Wetland Delineation Report prepared for the Proposed Action (RECON 2023c) (Appendix F). A routine aquatic resource delineation was performed on July 17, 2019. The water resource study area consisted of the Proposed Action site, plus a 100-foot buffer around the main portion of the Proposed Action site (no buffer along the access road), totaling 7.98 acres. A follow-up site visit was conducted on November 1, 2019. The aquatic resources delineation was performed according to the guidelines set forth by the U.S. Army Corps of Engineers (USACE; 1987, 2008).

The aquatic resources delineated include a total of 15 vernal pools and one wetland swale within the water resource study area (Figure 9). Four of the 15 vernal pools extend outside the limits of the water resource study area. Therefore, only the areas of the portions occurring within the water resource study area were used to calculate the total acreage of jurisdictional resources within the water resource study area. The culvert that crosses under the paved access road within the water resource study area is assumed to be considered non-wetland waters of the U.S. The aquatic resource features delineated within the water resource study area total 0.187 acre of wetland waters of the U.S. and 24 square feet (15.5 linear feet) of non-wetland waters of the U.S.

Of the 11 vernal pools sampled within the water resource study area, nine met the hydrophytic vegetation standard via the dominance test or prevalence index and all contained a vernal pool indictor plant species as defined by USACE (USACE 1997). The remaining two vernal pools were not sufficiently dominated by hydrophytic plant species to pass the dominance test or prevalence index. However, these two pools are still considered to meet the hydrophytic vegetation parameter under a problematic wetland; where the vegetation criteria are considered met when the area meets both the hydric soils and wetland hydrology criteria. In fact, all of the vernal pools sampled within the Survey Area could be considered to be problematic wetlands for vegetation because regular mowing occurs throughout these areas, which has likely significantly altered the percent cover and distribution of hydrophytic vegetation. The four vernal pools that were not sampled include one in the northern portion of the Survey Area and three in the eastern portion, east of the access road. As mentioned above, these areas do not undergo regular mowing and, therefore, would not be considered to be problematic wetlands for vegetation. Based on data provided by the City, hydrophytic vegetation is assumed present within these four unsampled vernal pools.

This page intentionally left blank

Image Source: Nearmap (flown January 2023)

Water Resource Study Area
Non-wetland Waters (18-inch culvert)
Wetlands (vernal pool)
Wetlands (swale)
Wetland Data Form Point (WDP)
Upland Data Form Point (UDP)
Photo Points (PP)
Topography (2-foot Contour Interval)

0 Feet 125

FIGURE 9
Water Resource Study Area

M:\JOBS5\9078\common_gis\fig9_EA.mxd fmm

This page intentionally left blank

Additionally, as mentioned above, all 11 of the sampled vernal pools within the water resource study area contain at least one vernal pool indicator plant species. The vernal pool indicator plant species observed includes dwarf woollyheads (*Psilocarphus brevissimus*; facultative wetland [FACW]) and Lemmon's canarygrass (*Phalaris lemmonii*; FACW). Dwarf wollyheads and hyssop loosestrife (*Lythrum hyssopifolia*; obligate) dominated the vegetation cover within the majority of the vernal pool depressions.

The swale in the southeastern portion of the water resource study area is fed by a culvert leading from the existing developed structures. The vegetation observed within this swale includes a number of herbaceous hydrophytic plant species, including hyssop loosestrife, tall flatsedge (*Cyperus eragrostis*; FACW), and toad rush (*Juncus bufonius*; FACW). Outside of the swale, the surrounding upland areas contained Diegan coastal sage scrub dominated by California buckwheat (*Eriogonum fasciculatum*; no indicator) and red brome.

The culvert that crosses under the paved access road within the water resource study area is assumed to be considered non-wetland waters of the U.S. (Figure 9). However, this culvert was not sampled during the surveys. The total estimate area for this non-wetland water feature is 24 square feet and 15.5 linear feet.

3.7.2 Surface Waters and Groundwater

This section incorporates information from the Storm Water Quality Management Plan (SWQMP) prepared for the Proposed Action (C&S Companies 2019) (Appendix G). The Proposed Action site is located within the San Diego River Watershed, Hydrologic Subarea 907.11. Runoff from the Proposed Action site currently drains to two low points within the ground disturbance area. The southern portion of the Proposed Action site drains to the northeast into an existing 24-inch corrugated metal pipe located in the parking lot near the southeastern most corner of the existing building. This pipe conveys flows underneath the paved surface discharging flows to the east into an existing natural meandering stream that conveys flows to the southeast, to a headwall immediately north of Runway 28R, then off-site further to the south into an existing underground public system within Aero Drive. The northern portion of the Proposed Action site drains east to a low point at the most northeast corner of the existing parking lot. Flows over top the existing paved road and continue southeast into the existing stream. Existing points of discharge from the Proposed Action site eventually flow into the San Diego River and then into the Pacific Ocean Shoreline; both of which are listed on the 2006 CWA Section 303(d) List of Water Quality Limited Segments. Groundwater is anticipated to be encountered at depths of approximately 10 to 20 feet.

This page intentionally left blank

4.0 ENVIRONMENTAL CONSEQUENCES AND AVOIDANCE AND MINIMIZATION

This chapter discusses the potential environmental impacts that could result from implementing the Proposed Action and the No Action Alternative. Specifically, this EA considers effects on the environmental resource categories identified in FAA Order 1050.1F. As defined by CEQ regulations (40 CFR Section 1508.89(b), direct impacts are those which are caused by the action and occur at the same time and place (i.e., construction); whereas indirect impacts are those which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

For the purposes of this EA, the environmental consequences have been evaluated for the Proposed Action and No Action alternatives. All other project alternatives under consideration were eliminated because they did not meet the stated project criteria (see Section 2.2). In accordance with the CEQ regulations, as contained within 40 CFR Section 1508.8, the No Action alternative has been retained for further environmental analysis.

4.1 Air Quality

This analysis incorporates the results of the Air Quality Analysis prepared for the Proposed Action (RECON 2023a) (see Appendix C) as well as the FAA's Aviation Environmental Design Tool (AEDT) post-processing emissions calculations.

4.1.1 Regulatory Setting

Ambient air quality standards represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 [42 U.S.C. 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, in order to achieve the purposes of Section 109 of the CAA [42 U.S.C. 7409], the U.S. Environmental Protection Agency (U.S. EPA) developed primary and secondary NAAQS. The primary NAAQS "in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health…." and the secondary standards "…protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 U.S.C. 7409(b)(2)]. The primary NAAQS were established, with a margin of safety, considering long-term exposure for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties). CARB has developed the CAAQS and generally has set more stringent limits on the criteria pollutants than the NAAQS.

The General Conformity Rule established under the CAA ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain the NAAQS. The General Conformity Rule applies to any federal action and requires analysis of emissions of criteria pollutants and their precursors for which an area is designated nonattainment or that is covered by a maintenance plan (FAA 2015). The General Conformity applicability analysis outlined in the *Aviation Emissions and Air Quality Handbook Version 3 Update 1* provides a range of factors to consider in determining whether the rule applies to the project/action. These factors include the following:

1. Will the action occur in a nonattainment or maintenance area(s);

2. Does a specific exemption allowed in the General Conformity Rule apply to the action;

3. Is the action, or portions of the project, included on the federal agency's list of "presumed to conform activities";

4. Do the total direct and indirect air emissions associated with the action exceed the General Conformity *de minimis* levels; and

5. Does the U.S. Environmental Protection Agency (EPA) approved State Implementation Plan have an emissions budget against which the emissions associated with the action could be compared and is the budget inclusive of the action?

If an action is not exempt or presumed to conform or found to cause emissions above applicable *de minimis* levels in any nonattainment or maintenance area, the agency must prepare a General Conformity Determination prior to taking the action (FAA 2015).

The Proposed Action site is located within the SDAB, which is a federal severe non-attainment area for 8-hour ozone, as well as a maintenance/attainment area for carbon monoxide (CO). Therefore, the General Conformity Rule is applicable to the project emissions of CO and ozone precursors (volatile organic compounds [VOC] and NO_X). The General Conformity *de minimis* levels applicable to the SDAB are shown in Table 6.

Table 6. General Conformity De Minimis Limits

Pollutant	Designation Category	Emissions (Tons/Year)
Ozone Precursors (VOC or NO_X)	Non-attainment (Severe)	25
Carbon Monoxide (CO)	Attainment (Maintenance)	100

Sources: 40 CFR 93.53(b)(1) and 40 CFR 93.53(b)(2)
Note: The U.S. EPA uses the term VOC and CARB's Emission Inventory Branch uses the term ROG, or reactive organic gases. ROG is similar, but not identical to VOC, which is based on U.S. EPA's exempt VOC list. There are minor deviations between compounds that define each term; however, the emissions of VOC and ROG are essentially the same for the emission sources considered in this analysis (CARB 2000, 2004).

4.1.2 Analysis Methodology and Significance Threshold

Construction emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2022.1 (California Air Pollution Control Officers Association 2022) which incorporates the most currently approved Emissions Factor Model and Off-Road emissions factors models. The CalEEMod program is a tool used to estimate air emissions resulting from land development projects based on California-specific emission factors. AEDT version 3b was used to model the change in operational aviation air quality emissions at MYF that would result from project operation. AEDT 3b is a modeling tool that calculates noise, fuel burn, and emissions associated with aviation operations. Aircraft emissions are a function of the number of aircraft operations expressed as landing and takeoff cycles, the aircraft fleet mix, and the length of time aircraft spend in each of the modes of operation defined in AEDT. AEDT also calculates emissions from auxiliary power units and ground support equipment; however, there is no auxiliary power unit usage at MYF.

The FAA's significance threshold would be exceeded if the Proposed Action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the U.S. EPA under the federal Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations. The significance criteria established by the applicable air pollution control district (SDAPCD) may be relied upon to make impact significance determinations.

4.1.3 Proposed Action

Direct Impacts

Construction

As shown in Table 7, maximum daily construction emissions associated with the project are projected to be less than the applicable City screening levels for all criteria pollutants. The City's screening levels, which are based on SDAPCD Rules 20.1, 20.2, and 20.3, are used as one of the considerations when determining the potential significance of air quality impacts for projects within the city. The screening levels align with attainment of the NAAQS and CAAQS. Additionally, as shown in Table 8, total annual construction emissions would be well less than the applicable General Conformity *de minimis* levels. Therefore, air quality impacts during construction activities would not result in adverse air quality impacts and a General Conformity determination is neither applicable nor required.

Table 7. Summary of Maximum Daily Construction Emissions (pounds per day)

Construction	Emissions					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Site Preparation	4	40	36	<1	22	12
Building Construction	1	12	14	<1	1	1
Paving	2	8	11	<1	1	<1
Maximum Daily Emissions	**4**	**40**	**36**	**<1**	**22**	**12**
City of San Diego Screening Level	*137*	*250*	*550*	*250*	*100*	*67*

Table 8. Summary of Total Annual Construction Emissions (tons per year)

Construction	Emissions					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2023	0.11	1.06	1.17	<0.005	0.16	0.10
2024	0.03	0.21	0.26	<0.005	0.01	0.01
Total	0.14	1.27	1.43	<0.005	0.17	0.11
General Conformity de minimis level	*25*	*25*	*100*	--	--	--

Operation

As shown in Table 9, maximum daily AirOps emissions are projected to be less than the applicable City screening levels for all criteria pollutants. As shown in Table 10, total annual AirOps emissions would be well less than the applicable General Conformity *de minimis* levels. Consequently, air quality impacts during operation would not exceed the NAAQS or CAAQS or contribute to existing violations and would not result in adverse air quality impacts. Therefore, a General Conformity determination is neither applicable nor required.

Table 9. Maximum Daily AirOps Emissions (pounds per day)

	Emissions					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Daily AirOps Emissions	1	16	12	3	<1	<1
City of San Diego Screening Level	*137*	*250*	*550*	*250*	*100*	*67*

Table 10. Maximum Annual AirOps Emissions (tons per year)

Construction	Emissions					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Annual AirOps Emissions	0.17	2.87	2.21	0.60	<0.01	<0.01
General Conformity de minimis level	*25*	*25*	*100*	--	--	--

Indirect Impacts

As discussed, indirect impacts are those which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. The Proposed Action would not result in emissions beyond those analyzed under Direct Impacts. The Proposed Action would not result in regional growth, create capacity for additional aircraft operations since SDFR would add additional aircraft to the fleet even without construction of the hangar, and would have no impact on any other MYF aircraft operations. Therefore, the Proposed Action would not result in any indirect impacts related to air quality.

4.1.4 No Action Alternative

Under the No Action Alternative, no construction activities would occur that would generate any new air quality emissions, and the AirOps facility would continue to operate without any hangar space at MYF. Therefore, it would not result in an additional impact related to air quality.

The Proposed Action would result in construction and operational air quality emissions compared to the No Action Alternative. These increases would not cause an exceedance of the NAAQS standards.

4.2 Biological Resources

This impact analysis incorporates the results of the Biological Resources Report prepared for the Proposed Action (City of San Diego 2020) (see Appendix D).

4.2.1 Regulatory Setting

Several federal statutes, regulations, executive orders, and policies must be considered when potential impacts to biological resources may occur as a result of a federal action.

- The Endangered Species Act (ESA) (16 U.S.C. §1531 et seq.) provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered 'take' under the ESA. Section 9(a) of the ESA defines 'take' as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The ESA is administered by the USFWS and the National Marine Fisheries Service. The USFWS has jurisdiction over terrestrial and freshwater species.

- The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712) protects migratory birds, including their active nests, eggs, and parts, from possession, sale, purchase, barter, transport, import, export, and take. The USFWS is the federal agency responsible for the management of migratory birds as they spend time in habitats of the U.S. For purposes of the MBTA, "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR § 10.12). The MBTA applies to migratory birds that are identified in 50 CFR § 10.13 (defined hereafter as "migratory birds").

- The MSCP is a comprehensive, long-term habitat conservation planning program that covers approximately 900 square miles in southwestern San Diego County under the federal and state ESA and state Natural Communities Conservation Plan Act of 1991. Local jurisdictions, including the City, implement their portions of the regional umbrella MSCP through Subarea Plans, which describe specific implementing mechanisms. The City's MSCP Subarea Plan, approved in March 1997, established the process for the issuance of incidental take permits (ITP) for listed species under Section 10(a)(1)(B) of the federal ESA and Section 2835 under the state ESA. The primary goal of the MSCP Subarea Plan is to conserve viable populations of sensitive species and to conserve regional biodiversity while allowing for reasonable economic growth. "MSCP Covered" refers to species covered by the City's federal ITP issued pursuant to Section 10(a) of the federal ESA (16 U.S.C. § 1539(a)(2)(A)). Under the federal ESA, an ITP is required when non-federal activities would result in "take" of a threatened or endangered species. The City Multi-Habitat Planning Area (MHPA) is a "hard line" preserve developed by the City in cooperation with the wildlife agencies, property owners, developers, and environmental groups. The MHPA identifies biological core resource areas and corridors targeted for conservation, in which only limited development may occur. The MHPA is considered an urban preserve that is constrained by existing or approved development and is comprised of habitat linkages connecting several large core areas of habitat.

- The VPHCP provides a regulatory framework to protect, enhance, and restore vernal pool resources in specific areas within the City's jurisdiction, while improving and streamlining the environmental permitting process for impacts to threatened and endangered species associated with vernal pools. The VPHCP is a conservation plan for vernal pools and seven threatened and endangered species that do not have federal coverage under the City's MSCP Subarea Plan, including five plant and two crustacean species. The VPHCP expands the City's existing MHPA established in the MSCP Subarea Plan to conserve additional lands with vernal pools that are occupied with the vernal pool covered species. Implementation of the VPHCP occurs through permanent protection of existing City-owned land for the conservation of vernal pools, conservation of private lands through the development entitlement process, the permanent management and monitoring of these lands, and annual reporting to the Wildlife Agencies that accounts for all take authorized, conservation achieved, and compliance and effectiveness monitoring (City of San Diego 2019).

4.2.2 Analysis Methodology and Significance Threshold

The FAA's significance threshold would be exceeded if the Proposed Action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would result in the destruction or adverse modification of federally designated critical habitat. The FAA has not established a significance threshold for non-listed species.

4.2.3 Proposed Action

Direct Impacts

Vegetation Communities and Sensitive Plants

Table 11 shows that the Proposed Action would permanently impact 3.719 acres of land. No mitigation is required for impacts to disturbed habitat or developed land. However, impacts to wetland habitats, San Diego mesa hardpan vernal pools (occupied with San Diego fairy shrimp), and San Diego mesa vernal pools (not occupied, but suitable habitat for San Diego fairy shrimp) would require restoration.

Table 11. Direct Impacts to Vegetation Communities (On-Site)

Vegetation Type	Direct Impacts (acres)*
Upland	
Developed	1.747
Disturbed	1.883
Wetland	
San Diego Mesa Hardpan Vernal Pool (occupied with San Diego Fairy Shrimp)	0.087
San Diego Mesa Vernal Pool (not occupied, but suitable habitat for San Diego fairy shrimp)	0.002
Total	**3.719**

*Values may vary slightly due to rounding errors.
Source: City of San Diego 2020

Critical habitat for spreading navarretia overlaps with the project footprint and is anticipated to be impacted. Approximately 1.014 acres (0.039 acre of San Diego mesa hardpan vernal pool, 0.637 acre of disturbed habitat, and 0.338 acre of existing road) of spreading navarretia critical habitat will be impacted by project construction. The existing road does traverse through San Diego fairy shrimp critical habitat. Impacts to critical habitat are covered under the City's VPHCP and discussed further below (City of San Diego 2019).

The Proposed Action would result in impacts to San Diego fairy shrimp and spreading navarretia critical habitat, both covered by the VPHCP. The VPHCP allows for the impact of heavily degraded pools, outside the MHPA, in exchange for the preservation and restoration of high-quality pools in the MHPA. Management, maintenance, enhancement, and/or restoration of conserved vernal pool complexes containing Critical Habitat, as described in the project's Vernal Pool Maintenance and Monitoring Program, would result in a net biological benefit for all these species and their Critical Habitats. Impacts to spreading navarretia critical habitat are consistent with the VPHCP and would be offset through the long-term implementation of the VPHCP.

The Proposed Action would not impact any vernal pools occupied by spreading navarretia. To offset impacts to vernal pools associated with the Proposed Action and other City projects, the City is proposing to restore a vernal pool complex (J13N) south of Airway Road and Caliente Avenue in the Otay Mesa Community Planning Area that would be utilized as a restoration site for impacts to vernal pools. Implementation of this restoration site would include restoration of vernal pools impacted by the Proposed Action. This restoration site is being implemented consistent with the requirements of the City's VPHCP

Sensitive Wildlife

San Diego fairy shrimp is listed as endangered by USFWS and is a VPHCP covered species. This species was observed in the biological resources study area within the 100-foot survey buffer and within five vernal pools within the Proposed Action site within San Diego mesa hardpan vernal pools. The Proposed Action would implement avoidance and minimization measures described in Section 4.2.3.1 below to avoid impacts to this species consistent with the requirements of the VPHCP.

On March 17, 2020, the USFWS completed Section 7 consultation for Proposed Action and determined that the Proposed Action would be consistent with the City's MSCP Subarea Plan and would include all applicable conservation measures in the City's Subarea Plan to avoid and minimize potential adverse effects to the gnatcatcher (USFWS 2020). USFWS also extended the FAA an incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their ITP for their VPHCP. Through Section 7 consultation, USFWS extended to the FAA the incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their incidental take permit for their VPHCP.

Indirect Impacts

Vegetation Communities and Sensitive Plants

San Diego mesa mint is a federally- and state-endangered, California Rare Plant Rank 1B.1 MSCP-covered and narrow endemic species that was observed in the biological resources study area within the 100-foot survey buffer in San Diego mesa hardpan vernal pools. This species will not be directly impacted by the Proposed Action. However, due to its proximity to the Proposed Action site, there is a potential for this species to be indirectly impacted. The Proposed Action would implement avoidance and minimization measures described below to avoid indirect impacts to this species.

Sensitive Wildlife

Coastal California gnatcatcher is federally-listed as Threatened, is designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW) and is a MSCP-covered species. California gnatcatcher is known to occur on MYF and is typically found in the south/southeastern area of the airport. One coastal California gnatcatcher was briefly observed during a site visit approximately 100 feet east of the Proposed Action site. The Proposed Action site does not contain appropriate nesting habitat and is composed of low-quality foraging habitat. The Proposed Action would implement avoidance and minimization measures described below to avoid indirect impacts to this species.

4.2.3.1 Avoidance and Minimization Measures

As described herein, the Proposed Action site incorporates avoidance and minimization measures to minimize project effects.

BIO-1 Habitat Restoration

Impacts to San Diego Mesa Hardpan vernal pool will be avoided through re-establishment and restoration of vernal pools, at the South Otay 1-acre parcels (J13N) in accordance with the requirements of the City's VPHCP and Biology Guidelines. The restoration plan includes the seeding of sites with inoculum from nearby vernal pools to help reestablish populations of San Diego button celery (*Eryngium aristulatum* var. *parishii*), spreading navarretia, California Orcutt grass (*Orcuttia californica*), San Diego fairy shrimp, and Riverside fairy shrimp. Inoculum from the impacted pools at MYF will not be used at the Otay 1-acre parcels site. Required restoration ratios and acreages are presented in Table 12.

Table 12. Required Restoration for Impacts to Vegetation Communities

Vegetation Type	Direct Impacts (acres)*	Restoration Ratio	Required Restoration
Developed (Tier IV)	1.747	0:1	0
Disturbed (Tier IV)	1.883	0:1	0
San Diego Mesa Hardpan Vernal Pool (Wetland)	0.089	2:1	0.178
Total	**3.719**	**--**	**0.178**

Source: Appendix D
*Values may vary slightly due to rounding errors.

BIO-2 Biological Resource Protection

Prior to the pre-construction meeting and the start of any project work the owner/permittee shall provide a letter to the City's Mitigation Monitoring Coordination (MMC) section stating that a Project Biologist (Qualified Biologist), as defined in the City's Biological Guidelines (2018), has been retained to implement the project's biological monitoring program. The biologist(s) shall be knowledgeable of vernal pool species biology and ecology. The letter shall include the names and contact information of all persons involved in the biological monitoring of the project. The project biologist will perform the following duties:

I. Prior to Construction

A. **Pre-Construction Meeting** – The Qualified Biologist(s) shall attend the pre-construction meeting, discuss the project's biological monitoring program, and arrange to perform any follow up mitigation measures and reporting including site-specific monitoring, restoration or revegetation, and additional fauna/flora surveys/salvage.

B. **Biological Documents** – The Qualified Biologist shall submit all required documentation to MMC verifying that any special mitigation reports including but not limited to, maps, plans, surveys, survey timelines, or buffers are completed or scheduled per City Biology Guidelines, MSCP, VPHCP, Environmentally Sensitive Lands Ordinance, project permit conditions, California Environmental Quality Act (CEQA), ESAs, and/or other local, state, or federal requirements.

C. **Biological Construction Mitigation/Monitoring Exhibit** – The Qualified Biologist shall present a Biological Construction Mitigation/Monitoring Exhibit (BCME), which includes the biological documents in B above. In addition, it includes: restoration/revegetation plans, plant salvage/relocation requirements, avian or other wildlife surveys/survey schedules (including general avian nesting and USFWS protocol), timing of surveys, wetland buffers, vernal pool buffer, avian construction avoidance areas/noise buffers/ barriers, other impact avoidance areas, and any subsequent requirements determined by the Qualified Biologist and the City Assistant Deputy Director (ADD)/MMC. The BCME shall include a site plan, written and graphic depiction of the project's biological mitigation/monitoring program, and a schedule. The BCME shall be approved by MMC and referenced in the construction documents.

D. **Resource Delineation** – Prior to construction activities, the Qualified Biologist shall supervise the placement of orange construction fencing (or equivalent) along the limits of disturbance adjacent to sensitive biological habitats and verify compliance with any other project conditions as shown on the BCME. The Qualified Biologist shall oversee the installation of erosion control measures within and upslope of vernal pools. This phase shall include flagging plant specimens and delimiting buffers to protect sensitive biological resources (e.g., habitats/flora and fauna species, including nesting birds) during construction. Appropriate steps/care should be taken to minimize attraction of nest predators to the site.

E. **Education** – Prior to commencement of construction activities, the Qualified Biologist shall meet with the owner/permittee or designee and the construction crew and conduct an on-site educational session regarding the need to avoid impacts outside of the approved construction area and to protect sensitive flora and fauna. At a minimum, training shall include (1) the purpose for resource protection; (2) a description of the vernal pool species and their habitat(s); (3) the conservation measures that must be implemented during project construction to conserve the vernal pool species, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the Proposed Action site by fencing); (4) environmentally responsible construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program, the need to adhere to the provisions of the federal ESA, and the penalties associated with violating the federal ESA.

F. **Avian Protection Requirements** – To avoid direct impacts to avian species identified as a listed, candidate, sensitive, or special status species in the MSCP, removal of habitat that supports active nests in the proposed area of disturbance should occur outside of the breeding season for these species (February 1 to September 15). If removal of habitat in the proposed area of disturbance must occur during the breeding season, the Qualified Biologist shall conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant shall submit the results of the pre-construction survey to City Development Services Department for review and approval prior to initiating any construction activities. If nesting birds are detected, a letter report or mitigation plan in conformance with the City's Biology Guidelines and applicable state and federal law (i.e., appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) shall be prepared and include proposed measures to be implemented to ensure that take of birds or eggs or disturbance of breeding activities is avoided. The report or mitigation plan shall be submitted to the City for review and approval and implemented to the satisfaction of the City. The City's MMC Section and Qualified Biologist shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction.

II. During Construction

A. **Monitoring** – All construction (including access/staging areas) shall be restricted to areas previously identified, proposed for development/staging, or previously disturbed as shown on "Exhibit A" and/or the BCME. The Qualified Biologist shall monitor construction activities as needed to ensure that construction activities do not encroach into biologically sensitive areas, or cause other similar damage, and that the work plan has been amended to accommodate any sensitive species located during the pre-construction surveys. The Qualified Biologist shall periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

B. **Monitoring (Vernal Pools)** – The Qualified Biologist shall inspect the fencing and erosion control measures within and upslope of vernal pool preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.

C. **Subsequent Resource Identification** – The Qualified Biologist shall note/act to prevent any new disturbances to habitat, flora, and/or fauna on site (e.g., flag plant specimens for avoidance during access, etc.). If active nests or other previously unknown sensitive resources are detected, all project activities that directly impact the resource shall be delayed until species-specific local, state, or federal regulations have been determined and applied by the Qualified Biologist.

D. **Stop Work** – Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to the City with 24 hours of its occurrence.

E. **Reporting** – Submit regular (e.g., weekly) letter reports to MMC and the City representative during project construction. In addition, the Qualified Biologist shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR shall be e-mailed to MMC on the first day of monitoring, the first week of each month, the last day of monitoring, and immediately in the case of any undocumented condition or discovery.

III. Post Construction Measures

A. **Final Report** - Submit a final report following completion of construction. The final report shall include as-built construction drawings with an overlay of habitat that was impacted and avoided, photographs of habitat areas that were avoided, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved. In the event that impacts exceed previously allowed amounts, additional impacts shall be mitigated in accordance with City Biology Guidelines, ESL and MSCP, VPHCP, State CEQA, and other applicable local, state, and federal law. The Qualified Biologist shall submit a final BCME/report to the satisfaction of the City ADD/MMC within 30 days of construction completion.

BIO-3: Vernal Pools

1. Any development adjacent to the MHPA shall be constructed to slope away from the extant pools to be avoided, to ensure that runoff from the project does not flow into the pools.

2. Covered projects shall require temporary fencing (with silt barriers) of the limits of project impacts (including construction staging areas and access routes) to prevent additional vernal pool impacts and prevent the spread of silt from the construction zone into adjacent vernal pools. Fencing shall be installed in a manner that does not impact habitats to be avoided. Final construction plans shall include photographs that show the fenced limits of impact and all areas of vernal pools to be impacted or avoided. If work inadvertently occurs beyond the fenced or demarcated limits of impact, all work shall cease until the problem has been remedied to the satisfaction of the City. Temporary construction fencing shall be removed upon project completion.

3. Impacts from fugitive dust that may occur during construction grading shall be avoided and minimized through watering and other appropriate measures.

4. A qualified monitoring biologist that has been approved by the City shall be on-site during project construction activities to ensure compliance with all construction measures identified in the CEQA environmental document. The biologist shall be knowledgeable of vernal pool species biology and ecology. The biologist shall perform the following duties:

   a. Oversee installation of and inspect the fencing and erosion control measures within or upslope of vernal pool restoration and/or preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.

   b. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

   c. Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented by construction personnel. At a minimum, training shall include (1) the purpose for resource protection; (2) a description of the vernal pool species and their habitat(s); (3) the conservation measures that must be implemented during project construction to conserve the vernal pool species, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the Proposed Action site by fencing); (4) environmentally responsible construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program, the need to adhere to the provisions of the federal ESA, and the penalties associated with violating the federal ESA.

d. Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to the City within 24 hours of its occurrence.

e. Submit regular (e.g., weekly) letter reports to the City during project construction and a final report to the City following completion of construction. The final report shall include as-built construction drawings with an overlay of habitat that was impacted and avoided, photographs of habitat areas that were avoided, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved.

5. The following conditions shall be implemented during project construction:

   a. Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint.

   b. The project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.

   c. Disposal or temporary placement of excess fill, brush, or other debris shall be limited to areas within the fenced project footprint.

6. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas within the fenced project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent any runoff from entering the vernal pools or their watersheds, and shall be shown on the construction plans. Fueling of equipment shall take place within existing paved areas greater than 100 feet from the vernal pools or their watersheds. Contractor equipment shall be checked for leaks prior to operation and repaired as necessary. A spill kit for each piece of construction equipment shall be on-site and must be used in the event of a spill. “No-fueling zones” shall be designated on construction plans.

7. Grading activities immediately adjacent to vernal pools shall be timed to avoid wet weather to minimize potential impacts (e.g., siltation) to the vernal pools unless the area to be graded is at an elevation below the pools. To achieve this goal, grading adjacent to avoided pools shall comply with the following:

   a. Grading shall occur only when the soil is dry to the touch both at the surface and 1 inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 inch below indicates whether the soil is dry.

   b. After a rain of greater than 0.2 inch, grading shall occur only after the soil surface has dried sufficiently as described above, and no sooner than 2 days (48 hours) after the rain event ends.

   c. To prevent erosion and siltation from storm water runoff due to unexpected rains, best management practices (i.e., silt fences) shall be implemented as needed during grading.

d. If rain occurs during grading, work shall stop and resume only after soils are dry, as described above.

e. Grading shall be done in a manner to prevent runoff from entering preserved vernal pools.

f. If necessary, water spraying shall be conducted at a level sufficient to control fugitive dust but not to cause runoff into vernal pools.

g. If mechanized grading is necessary, grading shall be performed in a manner to minimize soil compaction (i.e., use the smallest type of equipment needed to feasibly accomplish the work).

8. Prior to project construction, topsoil shall be salvaged from the impacted vernal pools or road ruts with fairy shrimp on-site consistent with the requirements of the approved restoration plan (e.g., free of versatile fairy shrimp [*Branchinecta lindahli*]). Vernal pool soil (inoculum) shall be collected when dry to avoid damaging or destroying fairy shrimp cysts and plant seeds. Hand tools (i.e., shovels and trowels) shall be used to remove the first 2 inches of soil from the pools. Whenever possible, the trowel shall be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling, which can damage the cysts. The soil from each pool shall be stored individually in labeled boxes that are adequately ventilated and kept out of direct sunlight in order to prevent the occurrence of fungus or excessive heating of the soil and stored off-site at an appropriate facility for vernal pool inoculum. Inoculum from different source pools shall not be mixed for seeding any restored pools, unless otherwise approved by the City and Wildlife Agencies. The collected soils shall be spread out and raked into the bottoms of the restored pools. Topsoil and plant materials salvaged from the upland habitat areas to be impacted shall be transplanted to, and/or used as a seed/cutting source for, the upland habitat restoration/creation areas to the maximum extent practicable as approved by the City.

   For this project, vernal pool soil will be collected and provided to the Airport Biologist for storage. The inoculum will not be used at the Otay 1-acre mitigation site for this project. The inoculum will be held by the Airport for use in a future vernal pool restoration project. The inoculum shall be packaged appropriately for long term storage (1 to 2 years).

9. Permanent protective fencing along any interface with developed areas and/or use other measures approved by the City to deter human and pet entrance into on- or off-site habitat shall be installed. Fencing shall be shown on the development plans and should have no gates (accept to allow access for maintenance and monitoring of the biological conservation easement areas) and be designed to prevent intrusion by pets. Signage for the biological conservation easement area shall be posted and maintained at conspicuous locations. The requirement for fencing and/or other preventative measures shall be included in the project's mitigation program.

10. In addition to the mitigation measures listed above, the following project specific mitigation measures shall be implemented to protect vernal pools:

a. **Culvert Inlet Protection** – Prior to the start of any construction work, storm drain inlet protection Best Management Practices (BMPs) shall be installed at the culvert/drainage on the south corner of the building. The BMPs shall be installed to prevent any silt, toxins, or construction debris from entering the drainage and the adjacent vernal pools.

b. **Vehicles and Construction Equipment** – All construction equipment shall be washed/cleaned prior to entering the Proposed Action site and after exiting the Proposed Action site to prevent the spread of invasive species and fairy shrimp cysts.

BIO-4: California Gnatcatcher

Prior to the issuance of any grading permit, Notice to Proceed (NTP), or Pre-construction meeting, the City Deputy Director (or appointed designee) shall verify that the MHPA boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the construction plans:

No clearing, grubbing, grading, or other construction activities shall occur between March 1 and August 15, the breeding season of the coastal California gnatcatcher, until the following requirements have been met to the satisfaction of the city manager:

A. A qualified biologist (possessing a valid endangered species act section 10(a)(1)(a) recovery permit) shall survey those habitat areas <u>within the MHPA</u> that would be subject to construction noise levels exceeding 60 A-weighted decibels [dB(A)] hourly average for the presence of the coastal California gnatcatcher. Surveys for the coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife service within the breeding season prior to the commencement of any construction. If gnatcatchers are present, then the following conditions must be met:

I. Between March 1 and August 15, no clearing, grubbing, or grading of occupied gnatcatcher habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; <u>and</u>

Ii. Between March 1 and August 15, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 dB(A) hourly average at the edge of occupied gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the city representative at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; <u>or</u>

iii. At least two weeks prior to the commencement of construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring* shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16).

* Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the City representative, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

B. If coastal California gnatcatchers are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the city manager and applicable resource agencies which demonstrates whether or not mitigation measures such as noise walls are necessary between March 1 and August 15 as follows:

I. If this evidence indicates the potential is high for coastal California gnatcatcher to be present based on historical records or site conditions, then condition A.iii shall be adhered to as specified above.

II. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

BIO-5: Revegetation of Temporary Impacts

Following completion of all construction work, any areas where soils were temporarily disturbed and not developed, shall be revegetated for erosion control, in accordance with the City's Landscape Standards and biological guidelines. A native low-grow upland seed mix shall be applied via hydroseed to all areas temporarily impacted. The Project Biologist will be responsible for developing the seed palette and must submit to MMC and the City's Representative for approval. Revegetated areas will be maintained and monitored for a minimum of 25-months to ensure successful erosion control.

BIO-6: Installation of Barrier

Following completion of all construction work, a barrier shall be installed along both sides of the access road from Ponderosa Avenue to the control tower parking lot to prevent unauthorized access into the MHPA and adjacent sensitive habitat. The barrier shall also be installed along the northeastern boundary of the Proposed Action site. The barrier design shall prevent vehicle access into environmentally sensitive areas and may consist of poles 3 to 4 feet tall with a rope or chain ran between the poles. The design of the barrier must be approved by Airport staff prior to installation and the installation must be monitored by a qualified vernal pool biologist. Signage for environmentally sensitive areas shall be posted and maintained at conspicuous locations along the barrier.

4.2.4 No Action Alternative

Under the No Action Alternative, there would be no vegetation removal or ground disturbance that would impact fish, wildlife, or plants.

The Proposed Action Alternative would result in direct impacts to 0.089 acre of San Diego mesa hardpan vernal pool/San Diego fairy shrimp habitat. The Proposed Action Alternative would also result in indirect impacts to San Diego mesa mint, and coastal California gnatcatcher. By following the measures above, impacts to San Diego mesa hardpan vernal pool, San Diego fairy shrimp, San Diego mesa mint, and coastal California gnatcatcher would be avoided.

4.3 Climate

This analysis incorporates the results of the Air Quality Analysis prepared for the Proposed Action (RECON 2023a) (see Appendix C) as well as AEDT post-processing GHG emissions calculations.

4.3.1 Regulatory Setting

The FAA provides guidance for assessing GHG emissions and determining impacts in the Aviation Emissions and Air Quality Handbook. According to the Aviation Emissions and Air Quality Handbook, there are currently no federal requirements for reporting GHG emissions from aviation sources as well as no significance thresholds. Rather, the information is to be provided for informational purposes as a means of disclosing the Proposed Action's potential effects on GHG emissions and climate change.

4.3.2 Analysis Methodology and Significance Threshold

GHG emissions associated with the Proposed Action would result from construction activities as well as from additional helicopter activities. Construction emissions were calculated using the CalEEMod program which incorporates the most current version of the Emission Factors Model (EMFAC) and Off-Road EMFACs. CalEEMod calculates GHG emissions based on fuel consumption from construction and land use projects. GHG emissions associated with MYF and SDFR operations were calculated in part using AEDT. As discussed in Section 3.3 above, GHGs include CO_2, nitrous dioxide (N_2O), and CH_4. The only GHG emissions calculated by AEDT are CO_2 emissions from aircraft engines. AEDT also calculates total fuel consumption. N_2O emissions were calculated using N_2O emission factors provided in Appendix C of the FAA's Aviation Emissions and Air Quality Handbook. Aircraft engines do not emit CH_4.

GHG emissions are estimated in terms of metric tons carbon dioxide equivalent. As noted by the FAA, CO_2e emissions are the preferred way to assess GHG emissions because they give weight to the global warming potential of different gases.

As described in the regulatory setting above, there are currently no federal requirements for reporting GHG emissions from aviation sources as well as no significance thresholds. However, emissions associated with construction and operation of the Proposed Action were calculated for informational purposes, as described in the following section.

4.3.3 Proposed Action

Direct Impacts

Construction

Construction activities emit GHGs primarily through the combustion of fuels in the engines of off-road construction equipment (primarily diesel) and in the engines of on-road vehicles used for the delivery of materials and the commute vehicles of the construction workers.

GHG emissions associated with construction activities were calculated using CalEEMod as a part of the Air Quality Analysis prepared for the Proposed Action. Based on these calculations, construction of the Proposed Action is anticipated to generate approximately 8 metric tons carbon dioxide equivalent amortized over 30 years as shown in Table 13.

Table 13. Estimated Construction Greenhouse Gas Emissions

Year	CO_2e (metric tons per year)
Year 2023	198
Year 2024	42
Total Construction Emissions	**240**
Amortized Over 30 Years	*8*

Source: RECON 2023a

Aircraft Operations

GHG emissions due to MYF and SDFR operations are summarized in Table 14. Calculation details are provided in the Air Quality Analysis prepared for the Proposed Action.

Table 14. Estimated Aircraft Greenhouse Gas Emissions

Emission Source	CO_2e (metric tons per year)
Existing Year 2023 MYF Emissions (Without Project)	44,036
Proposed Action Emissions	1,474
Total Existing + Proposed Action Emissions	45,509

Source: RECON 2023a

As described in the regulatory setting above, there are currently no federal requirements for reporting GHG emissions from aviation sources as well as no significance thresholds. Therefore, this information is provided for informational purposes as a means of disclosing the project's potential effects on GHG emissions and climate change and no further analysis at the federal level is required. As shown, existing year 2023 MYF emissions without the project total 44,036 MT CO_2E, and project emissions would total 1,474 MT CO_2E once all anticipated aircraft is added to the SDFR fleet for a total of 45,509 MT CO_2E resulting from all MYF operations. The CARB emissions inventory (see Table 5 above) indicate that statewide emissions totaled 369.3 MMT CO_2E in 2020, the latest year for which inventory data is available. Of this total, 2.9 MMT CO_2E are associated with aviation. The project emissions of 1,474 MT CO_2E represents only 0.0004 percent of total statewide emissions, and 0.05 percent of statewide aviation emissions.

Indirect Impacts

The Proposed Action would not result in emissions beyond those analyzed under Direct Impacts. The Proposed Action would not result in regional growth, create capacity for additional aircraft operations since SDFR would add additional aircraft to the fleet even without construction of the hangar, and would have no impact on any other MYF aircraft operations. Therefore, the Proposed Action would not result in any indirect impacts related to GHG.

4.3.4 No Action Alternative

Under the No Action Alternative, no construction activities would occur that would generate any additional GHG emissions and the AirOps facility would continue to operate and acquire two additional helicopters without any hangar space at MYF. Therefore, it would not result in an additional impact related to GHG.

4.4 Hazardous Materials, Solid Waste, and Pollution Prevention

4.4.1 Regulatory Setting

Federal, state, and local laws regulate the transportation, storage, use, and disposal of hazardous materials, solid waste, and pollution. These laws extend to past, present, and future landowners of properties containing hazardous materials. Development or other activities disturbing sites containing hazardous materials may create pathways that allow contaminants to affect human health and the environment.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishes liability for those parties responsible for hazardous substance releases to pay cleanup costs and establishes a trust fund to finance cleanup costs in situations in which no responsible party could be identified. CERCLA enables the creation of the National Priority List, a list of sites with known releases or threatened releases of hazardous substances in the United States and its territories used to guide the U.S EPA in determining which sites warrant further investigation. As conditions of a sale, release, or transfer of federal lands or facilities used to store hazardous materials or where a release or disposal of hazardous materials has occurred, federal agencies must identify those lands or facilities, and complete waste or contaminate cleanup of these lands or facilities.

The Oil Pollution Act requires oil storage facilities and vessels (with at least 1,320 gallons in above ground storage containers equal to or greater than 55 gallons each or greater than 42,000 gallons in underground storage tanks) to submit to the EPA plans detailing how the facilities will respond to large oil discharges.

Pollution Prevention Act of 1990 requires pollution prevention and source reduction controls to reduce the effect of these wastes on the environment.

The Resource Conservation and Recovery Act establishes guidelines for hazardous waste and non-hazardous solid waste management activities in the United States. The Resource Conservation and Recovery Act also regulates the generation, storage, treatment, and disposal of waste.

The Toxic Substances Control Act provides the EPA with the authority to regulate the production, importation, use, and disposal of chemicals defined as toxic, including lead, radon, asbestos, and polychlorinated biphenyls, that have the potential to cause unreasonable risk of injury to public health or the environment.

The Hazardous Materials Transportation Act regulates the transportation of hazardous materials to protect human life, property, and the environment from the risks inherent in the transportation of hazardous materials.

Executive Order 12088, *Federal Compliance with Pollution Control Standards* directs federal agencies to comply with applicable pollution control standards in the prevention, control, and abatement of environmental pollution.

Executive Order 12580, Superfund Implementation, delegates to a number of federal departments and agencies the authority and responsibility to implement certain provisions of CERCLA.

Executive Order 13834, *Efficient Federal Operations,* instructs federal agencies to meet statutory requirements that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. This executive order includes implementing waste prevention and recycling measures and complying with federal requirements with regard to solid, hazardous, and toxic waste management and disposal.

The terms “hazardous waste,” “hazardous substance,” and “hazardous material” are generally associated with industrial wastes, petroleum products, and other contaminants. These terms are described below:

- Hazardous wastes are defined as solid wastes that are ignitable, corrosive, reactive, or toxic. These are also known as “characteristic wastes.” The U.S. EPA has deemed certain solid wastes hazardous. These may be referred to as “listed wastes.”[2]

- Hazardous substances: Include hazardous waste, hazardous air pollutants, hazardous substances as defined under the CWA and Toxic Substances Control Act, and elements, compounds, mixtures, solutions, or substances listed in 40 CFR Part 302 that pose substantial harm to human health or environmental resources. Hazardous substances do not include any petroleum or natural gas substances and materials pursuant to Comprehensive Environmental Response, Compensation, and Liability Act.

- Hazardous material: Any commercially transported substances or materials that pose unreasonable risk to public health, safety, and property. Hazardous materials include hazardous waste and hazardous substances, as well as petroleum and natural gas materials and substances.[3]

4.4.2 Analysis Methodology and Significance Threshold

As discussed in Section 3.9, a review of the Review of the California DTSC Envirostor Database (DTSC 2020) and SWRCB Geotracker Database (SWRCB 2020) was conducted for the Proposed Action. In accordance with FAA Order 1050.1F, a Proposed Action would have an

[2] 40 CFR Part 261, Subpart C.
[3] 49 CFR Part 172, Table 172.101.

adverse effect if it were to involve a property on or eligible for the NPL. FAA Order 1050.1F does not establish significance thresholds for pollution prevention or solid waste. In addition, Executive Order 12088, as amended, directs federal agencies to comply with applicable pollution control standards. Construction and demolition waste are required to be disposed of in a manner consistent with local solid waste recycling, collection and disposal regulations, including the County Construction and Demolition Materials Diversion Program, as described in Sections 68.508 through 68.518 of the *San Diego County Code of Regulatory Ordinances.*

4.4.3 Proposed Action

Direct Impacts

Hazardous Materials

As discussed in Section 3.9, review of the California DTSC Envirostor Database (DTSC 2020) and SWRCB Geotracker Database (SWRCB 2020) determined that there are no listed hazardous materials sites located on the Proposed Action Site. All DTSC Envirostor Database (DTSC 2020) and SWRCB Geotracker Database (SWRCB 2020) listings within MYF are identified as closed. There are several active hazardous materials sites located within 0.5 mile of the Proposed Action site, but these sites are located outside of the MYF boundary. Construction of the Proposed Action would not affect any of these hazardous material sites outside of the MYF boundary. Helicopter flights associated with operation of the Proposed Action would not affect any of these sites. Additionally, none of these active hazardous materials sites are currently listed on the NPL, nor is it anticipated that they would be eligible for listing on the NPL. Petroleum based fuels will be used to power motorized construction equipment. All fuels are required to be stored in proper containers, with spill kits readily available, per applicable state and local guidelines. Additionally, any motorized equipment not in use shall have drip pans placed underneath to avoid spills. Asphalt will be placed for road resurfacing, and shall be recycled, or disposed of, in accordance with applicable state and local guidelines. Therefore, the Proposed Action would not affect a property on or eligible for the NPL, or any other hazardous materials sites.

Pollution Prevention

The Proposed Action does not contain project elements with a unique or increased potential to cause pollution. As described in Section 4.1, Air Quality above, the Proposed Action would not generate harmful air quality pollutants and would not result in direct adverse effects. As described in Section 4.7.2 Surface Waters and Groundwater below, the Proposed Action would include the installation of a modular wetland system that would capture and treat storm water runoff to avoid carrying pollutants off-site. Therefore, the Proposed Action would not result in direct adverse effects.

Solid Waste

Construction of the Proposed Action would generate construction waste (e.g., scrap wood, concrete, asphalt). Solid waste generated during construction would be disposed of at the nearest facility, which is the Miramar Landfill in San Diego, California. All hazardous waste will be separated and diverted consistent with applicable state and local guidelines, in joint effort with the City's Environmental Services Department. Spoil piles generated during construction would be stored within the temporary staging area and would be protected by construction BMPs while inactive. Additionally, spoil piles would be recycled, or disposed of, in a timely manner if not active, in accordance with applicable state and local guidelines. Solid waste generated by the Proposed Action would not cause or contribute to a direct adverse effect to solid waste.

Indirect Impacts

Hazardous Materials

The Proposed Action is limited to design and construction of permanent helicopter hangars and support facilities at MYF and would not generate hazardous materials. Therefore, the Proposed Action would not result in any indirect impacts related to hazardous materials.

Pollution Prevention

The Proposed Action does not contain project elements with a unique or increased potential to cause pollution. The Proposed Action would not generate harmful air quality pollutants and storm flows would be accommodated on-site using the modular wetland system. Therefore, the Proposed Action would not result in any indirect impacts related to pollution prevention.

Solid Waste

The Proposed Action is limited to design and construction of permanent helicopter hangars and support facilities at MYF. The Proposed Action would not generate operational waste (e.g., scrap wood, concrete, asphalt). Therefore, the Proposed Action would not result in any indirect impacts related to solid waste.

4.4.4 No Action Alternative

The No Action Alternative would not involve ground disturbance, introduce any new substances to the Proposed Action site, and/or generate new sources of trash; accordingly, it would not cause or contribute to hazardous materials, pollution, or solid waste impact.

The Proposed Action Alternative would not result in direct adverse effects related to hazardous materials compared to the No Action Alternative.

4.5 Natural Resources and Energy Supply

4.5.1 Regulatory Setting

Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, establishes an integrated strategy towards sustainability in the federal government and makes reduction of GHG emissions a priority for federal agencies. The Independence and Security Act (P.L. 110-140, 2007) requires federal agencies to take actions to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy GHG capture and storage options, and to improve the energy performance of the federal government.

4.5.2 Analysis Methodology and Significance Threshold

FAA order 1050.1F does not establish significance thresholds for energy supply or natural resources. The Order requires the Proposed Action to be examined to identify any proposed major changes that would have a measurable effect on local supplies of energy or natural resources. The Order further states that, “For most actions, changes in energy demands or other natural resource consumption will not result in significant impacts.”

4.5.3 Proposed Action

Direct Impacts

During construction, fuel would be used by construction vehicles and equipment. In addition, electricity provided by San Diego Gas & Electric or diesel fuel would be required to supply power tools on-site during construction. Reclaimed water may be used during construction to control fugitive dust and wash equipment, as available. Asphalt, lumber, and other construction materials derived from natural sources would not be used in unusually large quantities, nor would energy. Although the Proposed Action would support future helicopter flights that would consume fuel, proposed hangars and support facilities would also serve existing AirOps helicopters at MYF and the SDFR helicopter flights would occur regardless of the Proposed Action. Therefore, the Proposed Action would not cause an adverse direct impact to natural resources and the energy supply because it does not increase demand.

Indirect Impacts

Indirect impacts associated with natural resources and energy supply would be limited to maintenance activities that would consume negligible amounts of electricity, natural gas, water, and fossil fuels. Therefore, the Proposed Action would not result in any indirect impacts related to natural resources and energy supply.

4.5.4 No Action Alternative

The No Action Alternative would not change existing conditions at the site or consume resources for construction activities; therefore, it would not result in an effect to natural resources or energy supply.

The Proposed Action Alternative would result in a temporary increase in use of energy and natural resources associated with construction (aggregate, building materials) and there would be no indirect impacts compared to the No Action Alternative. The Proposed Action Alternative impacts would not exceed available or future supplies of these resources.

4.6 Noise and Noise-Compatible Land Use

This analysis incorporates the results of the Noise Analysis prepared for the Proposed Action (RECON 2023b) (see Appendix E).

4.6.1 Regulatory Setting

Policies and procedures for evaluating the environmental impacts associated with airport development are described in FAA Order 1050.1F. The noise analysis related policies and procedures are presented in Appendix B of the Order.

The determination of significance must be obtained using modeled noise contours along with local land use information and general guidance contained in Appendix A of 14 CFR Part 150. As a means of implementing the Aviation Safety and Noise Abatement Act, the FAA adopted Regulations on Airport Noise Compatibility Planning Programs.

4.6.2 Analysis Methodology and Significance Threshold

Policies and procedures for evaluating the environmental impacts associated with airport development are described in FAA Order 1050.1F (FAA 2015). The noise analysis related policies and procedures are presented in Appendix B of the Order..

Aircraft noise screening may rule out the need for more detailed noise analysis and provide documented support for a Categorical Exclusion (CATEX) if screening shows no potential for significant noise impacts. The FAA has multiple noise screening tools and methodologies. The Area Equivalent Method (AEM) can be used for "evaluating proposed actions and alternative(s) at an airport which result in a general overall increase in daily aircraft operations or the use of larger/noisier aircraft, as long as there are no changes in ground tracks, flight profiles or runway use. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. If the AEM calculations indicate an increase of 17 percent or more, or if the action is such that use of the AEM is not appropriate, then the noise analysis must be performed using the Aviation Environmental Design Tool (AEDT) to determine if significant noise impacts would result" (FAA 2020).

Construction noise levels were calculated at the airport boundary and at the nearest residential uses. Construction noise is considered a point source and would attenuate at approximately 6 dB(A) for every doubling of distance. For operational noise, this analysis calculates the change in noise levels due to the addition of project flights to the overall airport operations and compares the change in noise levels to the 1 dB screening threshold from the AEM approach to determine project impacts. Existing and future annual operations for Montgomery Gibbs Executive Airport were obtained from the City (City of San Diego 2022), and the increase in noise due to the addition of project flights was calculated.

4.6.3 Proposed Action

Direct Impacts

Construction

As shown in Table 15, construction noise levels are not anticipated to exceed 75 dB(A) one-hour equivalent noise level (L_{eq}) at any of the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that may be heard above ambient conditions, the exposure would be temporary. Therefore, construction would not permanently cause any noise sensitive areas to experience an increase in noise of CNEL 1.5 dB or more at above CNEL 65 dB noise exposure when compared to the baseline condition.

Table 15. Construction Noise Levels
[dB(A) L_{eq}]

	Total Noise Level at 50 Feet	Noise Level at Airport Boundary	Noise Level at Nearest Residential Uses
Site Preparation/Utilities	84	61	50
Building Construction	85	62	51
Paving	82	59	48

Operation

SDFR currently operates three helicopters from MYF consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk helicopter. By the first operational year, an additional Lockheed Martin/SikorskyS70i Firehawk helicopter would be included in the fleet. The final Bell 412 helicopter would be added to the fleet five years after opening year. The increase in noise levels due to the addition of project flights to the overall airport operations were calculated as described above. The results are summarized in Table 16.

Table 16. Increase in Operational Noise Levels

Year	Annual Operations without Project	Annual Operations with Project	ΔdB
2023	301,036	302,861	0.0
2024	301,638	303,463	0.0
2025	302,234	304,059	0.0
2026	302,832	304,657	0.0
2027	303,432	305,257	0.0
2028	304,033	305,858	0.0
2029	304,636	306,461	0.0
2030	305,241	307,066	0.0
2031	305,848	307,673	0.0
2032	306,456	308,281	0.0
2033	307,066	308,891	0.0
2034	307,678	309,503	0.0
2035	308,292	310,117	0.0
2036	308,907	310,732	0.0
2037	309,524	311,349	0.0
2038	310,143	311,968	0.0
2039	310,764	312,589	0.0
2040	311,386	313,211	0.0
2041	312,010	313,835	0.0
2042	312,636	314,461	0.0
2043	313,264	315,089	0.0
2044	313,894	315,719	0.0
2045	314,525	316,350	0.0
2046	315,158	316,983	0.0
2047	315,793	317,618	0.0
2048	316,430	318,255	0.0
2049	317,069	318,894	0.0
2050	317,709	319,534	0.0

As shown, the project would not result in a measurable increase in airport operational noise levels. Noise level increases would be less than the 1 dB screening threshold. Therefore, aircraft noise screening rules out the need for more detailed noise analysis.

Indirect Impacts

The Proposed Action would not create capacity for additional aircraft operations and would have no impact on any other MYF aircraft operations. Therefore, the Proposed Action would not result in any indirect impacts related to noise.

4.6.4 No Action Alternative

Under the No Action Alternative, no construction activities would occur that would generate noise. Additionally, the AirOps facility would continue to operate without any hangar space at MYF, and the City would still acquire one additional Lockheed Martin/SikorksyS70i Firehawk and one additional Bell 412. Therefore, it would not result in an effect related to noise.

The Proposed Action Alternative would generate construction and operational noise as compared to the No Action Alternative, but these noise increases would not violate any FAA standards.

4.7 Water Resources

As indicated in Chapter 3.0, the Proposed Action site is not within a 100-year floodplain or near a wild and scenic river. Therefore, the Proposed Action would have no impact on floodplains or wild and scenic rivers and do not require further analysis. This section will discuss potential impacts to wetlands, surface water, and groundwater.

4.7.1 Wetlands

4.7.1.1 Regulatory Setting

Executive Order 11990, *Protection of Wetlands* requires federal agencies to “avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.” The stated purpose of this Executive Order is to “minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.” USDOT Order 5660.1A, *Preservation of the Nation’s Wetlands* implements the guidelines set forth in Executive Order 11990. Transportation facilities should be planned, constructed, and operated in order to assure the protection and enhancement of wetlands to the fullest extent practicable. The CWA establishes the basic structure for regulating the discharge of pollutants into Waters of the United States, including wetlands, and is administered by the USACE. Section 404 and Section 401 are the two primary sections of the CWA relating to wetland impacts and permitting. Section 404 establishes a program to regulate the discharge of dredged or fill material into Waters of the United States, including wetlands. Section 401 requires a Water Quality Certificate for a project to ensure it does not violate state or tribal water quality standards. Section 401 certifications are generally issued by the state or tribe with jurisdictional authority.

The USACE *Wetland Delineation Manual* defines wetland areas that have positive indicators for hydrophytic vegetation, wetland hydrology, and hydric soils as:

> areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The USACE typically takes jurisdiction over wetlands only when they lie within or adjacent to navigable waters, or tributaries of such waters where those tributaries bear an ordinary high water mark. An ordinary high water mark 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 soil character, destruction of terrestrial vegetation, presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding areas.

The Regional Water Quality Control Board (RWQCB) administers the California Porter-Cologne Water Quality Control Act and is responsible for issuance of state water quality certification consistent with the requirements of Section 401 of the CWA. In addition, the CDFW regulates alterations to the flow, bed, channel, or bank of rivers, streams, and lakes pursuant to Sections 1600 et seq. of the California Fish and Game Code.

4.7.1.2 Analysis Methodology and Significance Threshold

The FAA's significance threshold would be exceeded if the Proposed Action would:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development of secondary activities or services that would cause the circumstances listed above to occur; or
- Be inconsistent with applicable state wetland strategies.

4.7.1.3 Proposed Action

This impact analysis incorporates the results of the Jurisdictional Waters/Wetland Delineation Report prepared for the Proposed Action (RECON 2023c) (see Appendix F).

Direct Impacts

The Proposed Action would result in direct impacts to vernal pools. A total of 15 vernal pools were mapped in the Survey Area. All 15 vernal pools mapped within the Survey Area, as well as the swale in the southeastern portion of the Survey Area, qualify as USACE jurisdictional waters. The water type for the vernal pools is considered "isolate," as they do not have a distinct connection to any wetland or non-wetland water drainage courses. However, the water type for the ephemeral swale and culvert are considered to be "non-relatively permanent waters" due to their connectivity with an off-site jurisdictional drainage.

There is no other practicable alternative that could further reduce impacts to wetlands. It is necessary that the proposed helicopter hangars and support facilities are located adjacent to the existing SDFR Facility. Therefore, it is not feasible to select an alternate location in order to avoid impacts to wetlands. The Proposed Action Alternative is the only alternative that achieves the purpose and need of the project as defined in Chapter 1, and the Proposed Action includes all practicable measures to minimize impacts to wetlands.

Indirect Impacts

The Proposed Action is limited to construction of permanent helicopter hangars and support facilities at MYF. Construction impacts would be confined to the Proposed Action site, and operation would not result in activities that could impact wetlands or non-wetland Waters of the U.S. off-site. Therefore, the Proposed Action would not result in any indirect impacts to wetlands or non-wetland Waters of the U.S. outside the Proposed Action site.

4.7.1.3.1 Mitigation Measures

The Proposed Action would impact six vernal pools that qualify as USACE jurisdictional waters. A pre-construction notification permit application will be submitted and evaluated by the USACE and RWQCB under Sections 404 and 401 of the CWA prior to construction. Mitigation will be analyzed as part of the permit application and verification process. If mitigation is required by jurisdictional agencies, measures will be implemented as special conditions of the verification.

4.7.1.4 No Action Alternative

Under the No Action Alternative, there would be no change to the existing site conditions. Therefore, the No Action Alternative would not result in adverse effects to riparian, aquatic, or wetland habitat, and no impacts to jurisdictional resources would occur.

The Proposed Action Alternative would have permanent impacts to six vernal pools, which qualify as USACE jurisdictional waters, as compared to the No Action Alternative which would avoid all impacts. Adherence to the steps described in Section 4.3.7.1.4 would ensure that impacts USACE jurisdictional waters would be in conformance with CWA requirements.

4.7.2 Surface Waters and Groundwater

4.7.2.1 Regulatory Setting

The Federal Water Pollution Control Act, as amended (commonly referred to as the Clean Water Act or CWA), provides the authority to establish water quality standards, control discharges, and regulate other issues concerning water quality. In accordance with the CWA, the EPA promulgated regulations for permitting storm water discharges, including those from construction activities, through the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program for construction applies to activities that disturb an area of one acre or more. Additionally, construction BMPs and associated plans must conform to the State of California's General Construction Permit. BMPs must be used to meet the NPDES permit requirements for storm water treatment. The main objective is to reduce runoff pollutants from urbanized areas discharging into the San Diego River.

The State Water Resources Control Board develops statewide policy and regulations for water quality control. The agency with local jurisdiction over water quality at the Proposed Action site is the RWQCB. The RWQCB has adopted the Water Quality Control Plan for San Diego Basin (Basin Plan), which contains specific objectives for the San Diego Hydrologic Unit that encompasses the Proposed Action site. The Basin Plan includes mandates to comply with NPDES requirements and use of BMPs.

4.7.2.2 Analysis Methodology and Significance Threshold

The FAA's significance threshold for surface waters would be exceeded if the Proposed Action would:

- Exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or
- Contaminate public drinking water supply such that public health may be adversely affected.

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider when evaluating the context and intensity of potential environmental impacts for surface waters. Factors to consider that may be applicable to surface waters include, but are not limited to, situations in which the Proposed Action or alternative(s) would have the potential to:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

The FAA's significance threshold for groundwater would be exceeded if the Proposed Action would:

- Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies; or
- Contaminate an aquifer used for public water supply such that public health may be adversely affected.

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider when evaluating the context and intensity of potential environmental impacts for groundwater. Factors to consider that may be applicable to groundwater include, but are not limited to, situations in which the Proposed Action or alternative(s) would have the potential to:

- Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values;
- Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

4.7.2.3 Proposed Action

This impact analysis incorporates the results of the SWQMP prepared for the Proposed Action (C&S Companies 2019) (see Appendix G).

Direct Impacts

Construction of the Proposed Action would comply with NPDES permit requirements, including the preparation of and adherence to a Storm Water Pollution Prevention Plan (SWPPP) during construction. The Proposed Action would route all runoff from new impervious areas into a modular wetland for water quality and then into an underground storage system for detention of the 100-year peak volumes. Captured peak runoff volumes from the six-hour, 100-year storm event would be pumped and hauled off for discharge into an acceptable MS4 that meets the requirements of the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266. Specific requirements for the Proposed Action under this permit would be determined during SWPPP development. The SWPPP shall identify site-specific BMPs to be employed during and post-construction, an implementation schedule, and a monitoring program and reporting requirements to reduce pollutants such as oil and grease, heavy metals, sediments, and trash and debris. Based on compliance with the Construction General Permit and its associated requirements, construction of the Proposed Action would not cause an adverse effect with regard to water quality or storm water pollution. The Proposed Action Alternative would improve site drainage compared to existing conditions and would not cause an operational increase in pollutants that could affect water quality.

Indirect Impacts

A modular wetlands system would capture and treat the overland flow generated by the Proposed Action. Additionally, a storage tank adjacent to the modular wetlands system will capture 100 percent of the six-hour, 100-year storm event from the proposed flows and unimproved tributary flows. The SWQMP prepared for the Proposed Action determine that the post-project storm water conveyance system would have adequate capacity to accommodate future runoff, and that flows would not discharge onto the vernal pools adjacent to the Proposed Action site. Therefore, the Proposed Action would not result in any indirect impacts related to water quality.

4.7.2.4 No Action Alternative

Under the No Action Alternative, there would be no change to the existing drainage patterns or quality of storm water runoff traversing or originating on the Proposed Action site. Therefore, the No Action Alternative would not result in adverse effects to groundwater or surface water quality.

The Proposed Action Alternative would improve site drainage compared to the No Action Alternative and would not cause an operational increase in pollutants that could affect water quality.

4.8 Cumulative Effects

Analysis of the cumulative overall impact of the Proposed Action and the consequences of subsequent related actions is required to determine the significance of potential cumulative impacts on the environment. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. Cumulative impact analysis considers connected actions, projects related and dependent upon the completion of the proposed airport project. It also considers similar actions or projects having a common geography or timing that provide a basis for considering their impact, together with impacts related to the proposed airport project. For this analysis, cumulative projects are those that that are included in the MYF Airport Master Plan presented in Table 17. The locations of these projects are presented in Figure 10.

Cumulative impacts must evaluate the past, present, and reasonably foreseeable future actions and their cumulative impact on environmental resources. For this analysis, past actions are those known to have occurred within the five years prior to the Proposed Action Alternative implementation. Present actions are those that are ongoing and will continue during the Proposed Action Alternative construction. Reasonably foreseeable actions are those that have: (1) federal, state, or local approval, permits, or funding for implementation; or (2) are programmed into the five-year Airport District Capital Improvement Program.

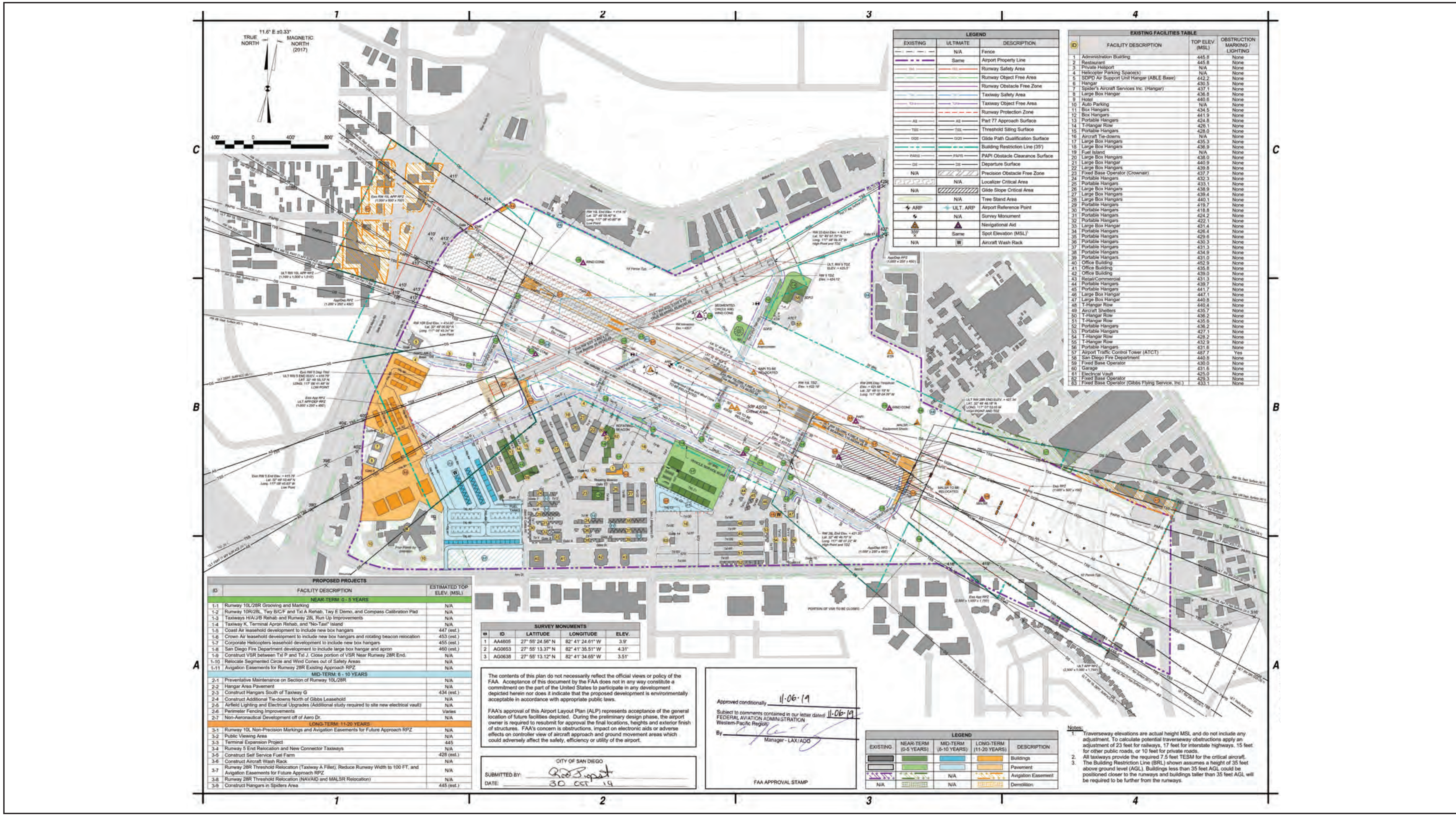
Specific thresholds for cumulative impacts are not established in FAA Order 1050.1F as the significance threshold varies according to the affected resources. In evaluating cumulative impacts, the impact of the Proposed Action alternative should be added to the impacts of other projects to determine if the significant impact threshold will be exceeded.

Table 17. Cumulative Projects

ID	Facility Description	Estimated Top Elev. (MSL)
	Previous Projects Completed in the last Five Years	
	Runway 523 and Taxiway Golf Rehab (Completed 2018)	N/A
	AirOps Phase I (Completed 2019)	N/A
	Near-Term: 0–5 Years	
1-1	Runway 10L/28R Grooving and Marking	N/A
1-2	Runway 10R/28L, Taxiway (Twy) B/C/F and Taxilane (Txl) A Rehab, Twy E Demo, and Compass Calibration Pad	N/A
1-3	Taxiways H/A/J/B Rehab and Runway 28L Run Up Improvements	N/A
1-4	Taxiway K, Terminal Apron Rehab, and “No-Taxi” Island	N/A
1-5	Coast Air leasehold development to include new box hangars	447 (est.)
1-6	Crown Air leasehold development to include new box hangars and rotating beacon relocation	453 (est.)
1-7	Corporate Helicopters leasehold development to include new box hangars	455 (est.)
1-8	San Diego Fire Department development to include large box hangar and apron	460 (est.)
1-9	Construct VSR between Txl P and Txl J. Close portion of VSR Near Runway 28R End.	N/A
1-10	Relocate Segmented Circle and Wind Cones out of Safety Areas	N/A
1-11	Navigation Easements for Runway 28R Existing Approach Runway Protection Zone (RPZ)	N/A
	Mid-Term: 6–10 Years	
2-1	Preventative Maintenance on Section of Runway 10L/28R	N/A
2-2	Hangar Area Pavement	N/A
2-3	Construct Hangars South of Taxiway G	434 (est.)
2-4	Construct Additional Tie-downs North of Gibbs Leasehold	N/A
2-5	Airfield Lighting and Electrical Upgrades (Additional study required to site new electrical vault)	N/A
2-6	Perimeter Fencing Improvements	Varies
2-7	Non-Aeronautical Development off of Aero Dr.	N/A
	Long-Term: 11–20 Years	
3-1	Runway 10L Non-Precision Markings and Navigation Easements for Future Approach RPZ	N/A
3·2	Public Viewing Area	N/A
3-3	Terminal Expansion Project	445
3·4	Runway 5 End Relocation and New Connector Taxiways	N/A
3-5	Construct Self Service Fuel Farm	428 (est.)
3-6	Construct Aircraft Wash Rack	N/A
3-7	Runway 28R Threshold Relocation (Taxiway A Fillet), Reduce Runway Width to 100 FT. and Navigation Easements for Future Approach RPZ	N/A
3-8	Runway 28R Threshold Relocation (NAVAID and MALSR Relocation)	N/A
3-9	Construct Hangars in Spiders Area	445 (est.)

This page intentionally left blank

Map Source: City of San Diego



RECON

M:\JOBS5\9078\env\graphics\EA\fig10_EA.ai 2/28/23 fmm

FIGURE 10
Cumulative Projects

This page intentionally left blank

4.8.1 Proposed Action

It has been determined through the data and analysis contained in Chapters 3 and 4 that the following resources are either not present at the Proposed Action site or will not be impacted by the Proposed Action or No Action Alternative. Therefore, no project specific or cumulative impact would occur to these resources: climate, coastal resources; Department of Transportation Act, Section 4(f); farmlands; historical, architectural, archaeological, and cultural resources; land use; natural resources and energy supply; noise and noise-compatible land use; socioeconomics, environmental justice, and children's environmental health and safety risks; and visual effects.

Resource issues that are appropriate for analysis under a cumulative impact assessment are addressed below and include potential impacts to air quality, biological resources, climate, hazardous materials, solid waste, pollution prevention, and water resources. These categories were identified for cumulative impact analysis because of the potential for impacts related to the Proposed Action.

<u>Air Quality</u>: Section 4.1 of the EA determined that the Proposed Action would not result in any air quality impacts. Cumulative air quality impacts are basin-wide, and air quality is affected by all pollutant sources in the basin. As the individual project thresholds are designed to help achieve attainment with cumulative basin-wide standards, they are also appropriate for assessing the project's contribution to cumulative impacts. While other known or foreseeable actions could occur during the same timeframe as the Proposed Action, implementation of appropriate measures during construction of cumulative projects listed in Table 17 would ensure that all air quality emissions from proposed construction activities within the SDAB project region, in combination with any reasonably foreseeable future emission source, would not produce adverse cumulative effects. The AEDT modeling conducted to evaluate operational air quality impacts was cumulative in nature since it considered other aircraft operations at MYF. Therefore, the Proposed Action, in combination with any reasonably foreseeable future projects, would not result in adverse cumulative effects.

<u>Biological Resources</u>: Implementation of avoidance and minimization measures described in Section 4.2 above would minimize and avoid impacts to sensitive species. Cumulative projects listed in Table 17 would also be required to implement mitigation measures, as necessary, to avoid impacts to sensitive species. Therefore, compliance by the Proposed Action and cumulative projects listed in Table 17 with appropriate federal, state, local regulations, and implementation of avoidance and minimization measures as necessary, would prevent cumulative impacts.

<u>Climate:</u> Section 4.3 of the EA determined that the Proposed Action would not result in any climate impacts. Given the related uncertainties involving the assessment of such emissions regionally and globally, the incremental contribution from construction of the Proposed Action on climate change/greenhouse gases in conjunction with other known or foreseeable actions cannot be adequately assessed given the current state of the science and assessment methodology.[4]

<u>Hazardous Materials, Solid Waste, and Pollution Prevention</u>: While other known or foreseeable actions could occur during the same timeframe as the Proposed Action, the Airport Sponsor would: implement project design features; comply with all federal, state, and local hazardous materials regulatory requirements; and implement safety precautions to reduce the risk of accidental releases. Cumulative projects listed in Table 17 would also be required to implement

[4]NEPA Regulations, CEQ, 40 CFR Section 1502.22, *Incomplete or Unavailable Information.*

appropriate design features and comply with applicable federal, state, and local hazardous materials regulatory requirements to avoid and minimize impacts. Therefore, the Proposed Action in conjunction with other known or foreseeable actions would not result in a cumulative impact involving hazardous materials, pollution prevention, or solid waste.

<u>Natural Resources and Energy Supply</u>: Construction of the Proposed Action and cumulative projects listed in Table 17 would utilize natural resources and energy such as fuel, electricity, water, asphalt, lumber, and other construction materials derived from natural sources. However, construction of the Proposed Action would not use unusually large quantities, nor volumes of energy or natural resources, and the Proposed Action would not increase operational use of energy or other natural resources at the airfield beyond what is already anticipated in the Airport Master Plan. Due to this relatively small and temporary use of energy or other natural resources, the Proposed Action, in combination with any reasonably foreseeable future projects, would not result in adverse cumulative effects.

<u>Noise</u>: Section 4.6 of the EA determined that construction of the Proposed Action would not result in any noise impacts. Due to the varied schedules for construction of cumulative projects listed in Table 17 and their distances from the Proposed Action site, it is unlikely construction activities would overlap with or result in cumulative increases in noise in conjunction with the Proposed Action. The calculated change in noise levels due to project operation is cumulative in nature since they considered other aircraft operations at MYF. Therefore, the Proposed Action, in combination with any reasonably foreseeable future projects, would not result in adverse cumulative effects.

<u>Water Resources (Wetlands)</u>: As described above in Section 4.7.1 Wetlands, the Proposed Action would result in permanent impacts to Waters of the U.S. that would require review and consultation from the USACE under Section 404 of the CWA. Mitigation will be analyzed as part of the consultation process. If mitigation is required, measures will be implemented as conditions of the project. Cumulative projects listed in Table 17 would also require review and consultation from the USACE and implementation of avoidance, minimization, and mitigation measures as necessary to comply with applicable sections of the CWA. Compliance and implementation of avoidance, minimization, and mitigation measures as necessary by the Proposed Action and cumulative projects listed in Table 17 would minimize cumulative impacts on wetlands.

4.8.2 No Action Alternative

The No Action Alternative would not result in effects on the environment; therefore, it would not be combined or considered in conjunction with other known or foreseeable actions resulting in cumulative effects on the resources addressed in this EA.

5.0 AGENCY AND PUBLIC INVOLVEMENT

5.1 Agency Involvement

Appendix A to this EA includes public notices and agency correspondence associated with the Proposed Action and this EA.

State Historic Preservation Officer

On TBD, the FAA initiated Section 106 Consultation with the State of California, State Historic Preservation Officer (SHPO) in accordance with the National Historic Preservation Act. SHPO concurred with the FAA's determination on TBD. Copies of the correspondence between SHPO and FAA are included in Appendix A. [To be completed once Section 106 is complete.]

Tribal Consultation

RECON submitted a letter to the Native American Heritage Commission (NAHC) on May 22, 2018, and again on May 30, 2019, requesting them to search their files to identify spiritually significant and/or sacred sites or traditional use areas in the Proposed Action vicinity. RECON also requested the NAHC to provide a list of local Native American tribes, bands, or individuals who may have concerns or interests in the cultural resources of the Proposed Action site. RECON received results from the NAHC on June 14, 2019 that were positive and indicated that the Viejas Band of Kumeyaay Indians should be contacted for further information.

The FAA conducted government to government Tribal consultation. The FAA sent consultation initiation letters to 11 Tribes on various dates (Table 1; Appendix B). Of these Tribes, three responded. The Campo Band of Diegueno Mission Indians indicated that the area is rich in history for the Kumeyaay people and requested cultural monitors from Campo be present during future surveys and ground disturbing activities. The Viejas Band of Kumeyaay Indians indicated that the project may contain sacred sites to the Kumeyaay people and requested those sites be avoided with adequate buffer zones. Additionally, the Viejas Band stated that the project area has cultural significance to Viejas and requested a Kumeyaay Cultural Monitor be on site for ground disturbing activities. The San Pasqual Band requested extreme care be taken during excavation due to the possibility of disturbing cultural resources and indicated that Kumeyaay monitors would be present during the excavation phase of the project.

As follow-up to the Viejas Band response, the FAA emailed Mr. Ray Teran on April 30, 2020, asking if there is a sacred site within the APE and for the appropriate contact information for the Viejas monitor. On August 23, 2021, the FAA again emailed Mr. Ray Teran and Mr. Ernest Pingleton asking about location of sacred sites.

Section 7 Consultation

On March 17, 2020, the USFWS completed Section 7 consultation for Proposed Action and determined that the Proposed Action would be consistent with the City's MSCP Subarea Plan and would include all applicable conservation measures in the City's Subarea Plan to avoid and minimize potential adverse effects to the gnatcatcher (USFWS 2020). USFWS also extended the FAA an incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their ITP for their VPHCP. Through Section 7 consultation, USFWS extended to the FAA the incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their incidental take permit for their VPHCP.

5.2 Public Involvement

This Draft EA is being distributed for public review and comment for 30 days, from TBD. A Notice of Availability will be published in the *Daily Transcript* newspaper on TBD.

The City will prepare written response to comments received on the Draft EA and prepare a Final EA for transmittal to FAA for review and approval. The FAA, based on the information contained in the EA and comments submitted, will make a decision on the Proposed Action and issue a finding. The Final EA and FAA's finding will be available to the public and all who comment on this EA.

6.0 LIST OF PREPARERS

6.1 U.S. Department of Transportation, Federal Aviation Administration

Western-Pacific Region Airports Division
Los Angeles Airports District Office
777 South Aviation Boulevard
El Segundo, California 90245

Gail Campos – Environmental Protection Specialist, FAA Los Angeles Airports District Office: M.S. Biology, B.S. Biology, B.S. Recreation Management. 24 years of experience. Responsible for the FAA review of the environmental assessment; coordination with the California State Historic Preservation Office, and the U.S. Fish and Wildlife Service.

Edvige Mbakoup – Environmental Protection Specialist, FAA Los Angeles Airports District Office: MPH Environmental Health Sciences, B.S. Biology. 6 years of experience. Responsible for the FAA peer review of the environmental assessment; coordination with California State Historic Preservation Office and U.S. Army Corps of Engineers.

6.2 City of San Diego

Engineering and Capital Projects Department
525 B Street, MS908A, 12th Floor
San Diego, CA 92101

James Botica – Associate Engineer (Civil): City Project Manager, and responsible for City review of the Environmental Assessment.

6.3 Consultants

RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108

Michael Page – Principal: B.A. Environmental Science and Geology/Biology. 32 years of experience. Directed preparation of the EA and technical reports.

Nick Larkin – Senior Project Manager: M.A. Urban Planning, B.A. Urban Studies and Planning. 20 years of experience. Project manager and primary author of the EA.

Carmen Zepeda-Herman – Senior Archaeologist: M.A. Anthropology, B.A. Anthropology. 22 years of experience. Prepared the Historical Resources Survey.

Andrew Smisek – Biologist: B.S. Biology. 9 years of experience. Prepared the Jurisdictional Waters/Wetland Delineation.

Jesse Fleming – Senior Environmental Specialist: B.S. Mathematics. 17 years of experience. Prepared the Air Quality Analysis and Noise Analysis and the climate section of the EA.

Frank McDermott – GIS Coordinator: B.S. Environmental Planning and Design. 24 years of experience. Prepared figures for the EA and technical reports.

This page intentionally left blank

7.0 REFERENCES

Atkins

2017 San Diego Fire Department Hangar Feasibility Study. March 24.

C&S Companies

2019 Storm Water Quality Management Plan (SWQMP), San Diego Fire-Rescue Air Ops Facility. January 25.

California Air Pollution Control Officers Association (CAPCOA)

2017 California Emissions Estimator model (CalEEMod). User's Guide Version 2016.3.2. October 2017.

California Air Resources Board (CARB)

2023 California Air Quality Data Statistics. Top 4 Summary and Hourly Listing. Available at http://www.arb.ca.gov/adam/welcome.html. Accessed on February 14, 2023.

2022 California Greenhouse Gas Inventory for 2000-2020 – By Sector and Activity. Accessed at https://ww2.arb.ca.gov/ghg-inventory-data. Updated October 26, 2022.

2007 California Greenhouse Gas Inventory – Summary by Economic Sector. Last updated November 19, 2007.

2004 Definitions of VOC and ROG. Accessed at extension://elhekieabhbkpmcefcoobjddigjcaadp/https://www.arb.ca.gov/ei/speciate/voc_rog_dfn_11_04.pdf. Updated November 2004.

2000 FACT SHEET #1: Development of Organic Emission Estimates For California's Emission Inventory and Air Quality Models. Prepared by the California Air Resources Board, Planning and Technical Support Division, Modeling and Meteorology Branch and Emission Inventory Branch. Accessed at https://www.arb.ca.gov/ei/speciate/factsheets_model_ei_speciation_tog_8_00.pdf. August 2000.

California Department of Conservation

2016 California Important Farmland Finder. Available at https://maps.conservation.ca.gov/dlrp/ciff/. Accessed on July 16, 2019.

California Department of Toxic Substances Control (DTSC)

2020 EnviroStor database. Accessed on January 10, 2020.

California State Water Resources Control Board (SWRCB)

2020 GeoTracker database. Accessed on January 10, 2020.

Federal Emergency Management Agency (FEMA)

2012 National Flood Hazard Layer. Accessed on February 28, 2023.

RECON Environmental, Inc. (RECON)

2023a Air Quality Analysis for the San Diego Fire-Rescue Air Operations Hangar Project San Diego, California. February 16.

2023b Noise Analysis for the San Diego Fire-Rescue Air Operations Hangar Project San Diego, California. February 16.

2023c Jurisdictional Waters/Wetland Delineation for the San Diego Fire- Rescue Air Operations Hangar Project San Diego, California. February 16.

2022 Historical Resources Survey for the San Diego Fire-Rescue Air Operations Hangar Project (WBS #B-15012.02.02). October 12.

City of San Diego, Engineering and Capital Projects Department

2017 Airport Master Plan, Montgomery-Gibbs Executive Airport, Working Paper 4 – Environmental Overview. Prepared by Atkins. October 2017.

2018 San Diego Municipal Code. Land Development Manual. Biology Guidelines. Adopted September 28, 1999. Amended February.

2019 Revised Final City of San Diego Vernal Pool Habitat Conservation Plan. October.

2020 Biological Resource Report, Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II, San Diego, California. July 29.

U.S. Army Corps of Engineers (USACE)

1987 Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, Department of the Army. January.

1997 Regional General Conditions to the Nationwide Permits – Vernal Pool Indicator Species List. Los Angeles District South Pacific Division. November.

2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. September

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)

2018 Soil Survey Geographic Database. Accessed on February 28, 2023.

U.S. Department of Commerce, Bureau of the Census

2018 Census of Population and Housing.

U.S. Environmental Protection Agency (EPA)

2020 National Priorities List (NPL) Sites - by State. Available at https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#CA. Accessed on January 10, 2020.

U.S. Federal Aviation Administration (FAA)

2015 1050.1F Desk Reference.

2019 Aviation Environmental Design Tool 3b.

U.S. Fish and Wildlife Service (USFWS)

2020 Section 7 Consultation for the Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project, City of San Diego, California.

8.0 LIST OF ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
ADD	Assistant Deputy Director
AEDT	Aviation Environmental Design Tool
AirOps	Air Operations
ALP	Airport Layout Plan
APE	area of potential effect
Basin Plan	Water Quality Control Plan for San Diego Basin
BCME	Biological Construction Mitigation/Monitoring Exhibit
BMP	Best Management Practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
City	City of San Diego
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CSVR	Consultant Site Visit Record
CWA	Clean Water Act
dB	decibels
dB(A)	A-weighted decibel
DTSC	California Department of Toxic Substances Control
EA	Environmental Assessment
EMFAC	Emission Factors Model
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FACW	facultative wetland
FEMA	Federal Emergency Management Agency
FSS	Flight Service Station
GHG	greenhouse gas
GWP	global warming potential
ITP	incidental take permit
L_{eq}	one-hour equivalent noise level
MBTA	Migratory Bird Treaty Act
MHPA	Multi-Habitat Planning Area
MMC	Mitigation Monitoring Coordination
MMRP	mitigation monitoring and reporting program
MMT CO_2E	million metric tons of carbon dioxide equivalent
MT CO_2E	metric tons of carbon dioxide equivalent
MSCP	Multiple Species Conservation Plan
MYF	Montgomery-Gibbs Executive Airport
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

NTP	Notice to Proceed
O_3	oxygen
P.L.	Public Law
PM_{10}	particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 microns or less
ppm	parts per million
Proposed Action	San Diego Fire-Rescue Air Operations Hangar Project
PUMA	Public Use Microdata Area
RECON	RECON Environmental, Inc.
ROFA	Runway Object Free Area
ROG	reactive organic gases
RPZ	Runway Protection Zone
RWQCB	Regional Water Quality Control Board
SDAB	San Diego Air Basin
SDFR	San Diego Fire-Rescue
SDAPCD	San Diego Air Pollution Control District
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
SWQMP	Storm Water Quality Management Plan
SWRCB	State Water Resources Control Board
TAF	Terminal Area Forecast
U.S. EPA	United States Environmental Protection Agency
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compounds
VPHCP	Vernal Pool Habitat Conservation Plan

APPENDICES
UNDER SEPARATE COVER

This page intentionally left blank

APPENDIX A
Public Involvement and Agency/Tribal Consultations

This page intentionally left blank

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901
http://www.fws.gov/carlsbad/

In Reply Refer To: November 02, 2018
Consultation Code: 08ECAR00-2019-SLI-0158
Event Code: 08ECAR00-2019-E-00385
Project Name: Fire Rescue Air Operations Center and Parking Pad Expansions

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Consultation Code: 08ECAR00-2019-SLI-0158

Event Code: 08ECAR00-2019-E-00385

Project Name: Fire Rescue Air Operations Center and Parking Pad Expansions

Project Type: DEVELOPMENT

Project Description: The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The existing 8,100 sf (90 ft. x 90 ft.) concrete parking pad and crushed rock border parking pad would be expanded to 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 feet (ft.) to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/32.81822635006196N117.13537994807164W

Counties: San Diego, CA

Endangered Species Act Species

There is a total of 17 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Pacific Pocket Mouse *Perognathus longimembris pacificus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8080	Endangered

Birds

NAME	STATUS
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Coastal California Gnatcatcher *Polioptila californica californica* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8178	Threatened
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Light-footed Clapper Rail *Rallus longirostris levipes* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6035	Endangered
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Crustaceans

NAME	STATUS
Riverside Fairy Shrimp *Streptocephalus woottoni* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8148	Endangered
San Diego Fairy Shrimp *Branchinecta sandiegonensis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6945	Endangered

Flowering Plants

NAME	STATUS
California Orcutt Grass *Orcuttia californica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4923	Endangered
Salt Marsh Bird's-beak *Cordylanthus maritimus ssp. maritimus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6447	Endangered
San Diego Ambrosia *Ambrosia pumila* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8287	Endangered
San Diego Button-celery *Eryngium aristulatum var. parishii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5937	Endangered
San Diego Mesa-mint *Pogogyne abramsii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5971	Endangered
San Diego Thornmint *Acanthomintha ilicifolia* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/351	Threatened
Spreading Navarretia *Navarretia fossalis* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1334	Threatened
Willowy Monardella *Monardella viminea* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/250	Endangered

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
San Diego Fairy Shrimp *Branchinecta sandiegonensis* https://ecos.fws.gov/ecp/species/6945#crithab	Final
Spreading Navarretia *Navarretia fossalis* https://ecos.fws.gov/ecp/species/1334#crithab	Final

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-SD-20B0123-20F0656

March 17, 2020
Sent Electronically

Ms. Gail Campos
Environmental Protection Specialist
Federal Aviation Administration
Los Angeles Airports District Office
777 Aviation Boulevard, Suite 150
El Segundo, California 90245

Subject: Section 7 Consultation for the Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project, City of San Diego, California

Dear Ms. Campos `

This document transmits the U.S. Fish and Wildlife Service's (Service) streamlined consultation based on our review of the Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project (project) and its effects on the federally endangered San Diego fairy shrimp *(Branchinecta sandiegonensis*) and it's designated critical habitat, Riverside fairy shrimp (*Streptocephalus woottoni*), San Diego button-celery (*Eryngium aristulatum* var. *parishii*; button celery), Otay mesa mint (*Pogogyne nudiuscula*; mesa mint), spreading navarretia *(Navarretia fossalis*; navarretia) and it's designated critical habitat, California Orcutt grass (*Orcuttia californica*; Orcutt grass), and the threatened coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher), in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.). We initiated consultation on February 25, 2020, the date we received your agency's request for consultation.

This streamlined consultation is based on information provided in: (1) your February 25, 2020, request for consultation; (2) the *Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II, San Diego, California Biological Resource Report* (City 2019a); (3) the *Vernal Pool Mitigation Plan for the La Media Road Widening & Fire Rescue Air Operations Phase II Project San Diego, California* (Recon 2019); (4) the *City of San Diego Vernal Pool Habitat Conservation Plan* (VPHCP; City 2017); (5) *Intra-Service Biological Opinion* (*10B0010-18F1285*) *for Issuance of an Endangered Species Act Section 10*(*a*)(*1*)(*B*) *Permit* (*TE 97791C*) *for the City of San Diego Vernal Pool Habitat Conservation Plan, City of San Diego, California* (2018 biological opinion; Service 2018); (6) *Multiple Species Conservation Program City of San Diego MSCP Subarea* Plan (Subarea Plan; City 1997); (7) *Biological and Conference Opinions on Issuance of an Incidental Take Permit to the City of San Diego pursuant to the Multiple Species Conservation Program (1-6-97-FW-47)* (1997 biological opinion; Service 1997); and (8) other sources of information including survey reports, technical reviews, and email correspondence. A complete project file addressing this consultation is maintained at the Carlsbad Fish and Wildlife Office.

The proposed action is Federal Aviation Administration's (FAA) approval for the City of San Diego (City) to construct 3.72 acres of new hangar space and concrete apron to accommodate five helicopters and support vehicles. The project also includes two 12,000 gallon above-ground fuel storage tanks. Additionally, the proposed project will relocate existing utility connections within the main access roadway from Ponderosa Avenue and install underground storm water retention features. Construction access to the site will be via the airport perimeter gate at Ponderosa Avenue, and the onsite road which leads directly to the site. The staging area for the project will be on existing paved and/or disturbed areas within the project footprint (Figure 1). Construction is anticipated to begin in the spring of 2020 and be completed in about 2 years.

The project site is located at Montgomery-Gibbs Executive Airport, east of Taxiway C, and north of the air traffic control tower. Montgomery-Gibbs Executive Airport is within the City in the Kearny Mesa Community Planning Area. The project is also within both the City's Multiple Species Conservation Program (MSCP) Subarea Plan and Vernal Pool Habitat Conservation Plan (VPHCP) boundary. The MSCP Multiple Habitat Preservation Area (MHPA) is adjacent to the project. Approximately 2.99 acres of coastal sage scrub are located within the 100-foot survey limit east of the project area. No protocol surveys were completed; however, one gnatcatcher was briefly observed approximately 100-feet east of the project area, foraging within the coastal sage scrub. The project will not remove coastal sage scrub and impacts to gnatcatcher are expected to be limited to indirect impacts and the loss of low quality foraging habitat.

The MSCP was established to minimize and mitigate habitat loss and impacts to covered species in association with specific activities covered by the program. The MSCP encompasses a 900-square mile area in southwestern San Diego County and includes the City, 10 additional city jurisdictions, and unincorporated portions of the County of San Diego. On July 18, 1997, our agency issued an incidental take permit under section 10(a)(1)(B) of the Act to the City for their Subarea Plan under the broader MSCP.

The gnatcatcher is a covered species under the City's Subarea Plan. The status of the gnatcatcher and the effects of implementing the City's Subarea Plan were previously addressed in our 1997 biological opinion for issuance of an incidental take permit to the City. In the 1997 biological opinion, we concluded that the effects of the City's Subarea Plan and level of incidental take were not likely to jeopardize the continued existence of the gnatcatcher. The project is consistent with the City's Subarea Plan and includes all applicable conservation measures in the City's Subarea Plan to avoid and minimize potential adverse effects to the gnatcatcher. Therefore, we do not anticipate any adverse effects to the gnatcatcher that were not previously evaluated in our 1997 biological opinion, and no further consultation on the gnatcatcher pursuant to the Act is necessary.

Based on 2017-2018 and 2018-2019 wet season surveys (City 2019a, 2019b), the project will impact 6 vernal pools (0.089 acre) known or potentially occupied by San Diego fairy shrimp (Figure 1, Table 1). In addition, the project occurs within Subunit 3D and 4M of designated critical habitat for navarretia (Service 2010) and San Diego fairy shrimp (Service 2007), respectively. The project will also impact approximately 1.014 acres (0.039 acre of vernal pool, 0.637 acre of disturbed habitat, and 0.338 acre of existing road) of navarretia critical habitat and 0.338 acre (existing road) of San Diego fairy shrimp critical habitat. However, the final rules for both critical habitat designations exclude by text any developed areas inadvertently left inside critical habitat boundaries. Therefore, the existing road is excluded.

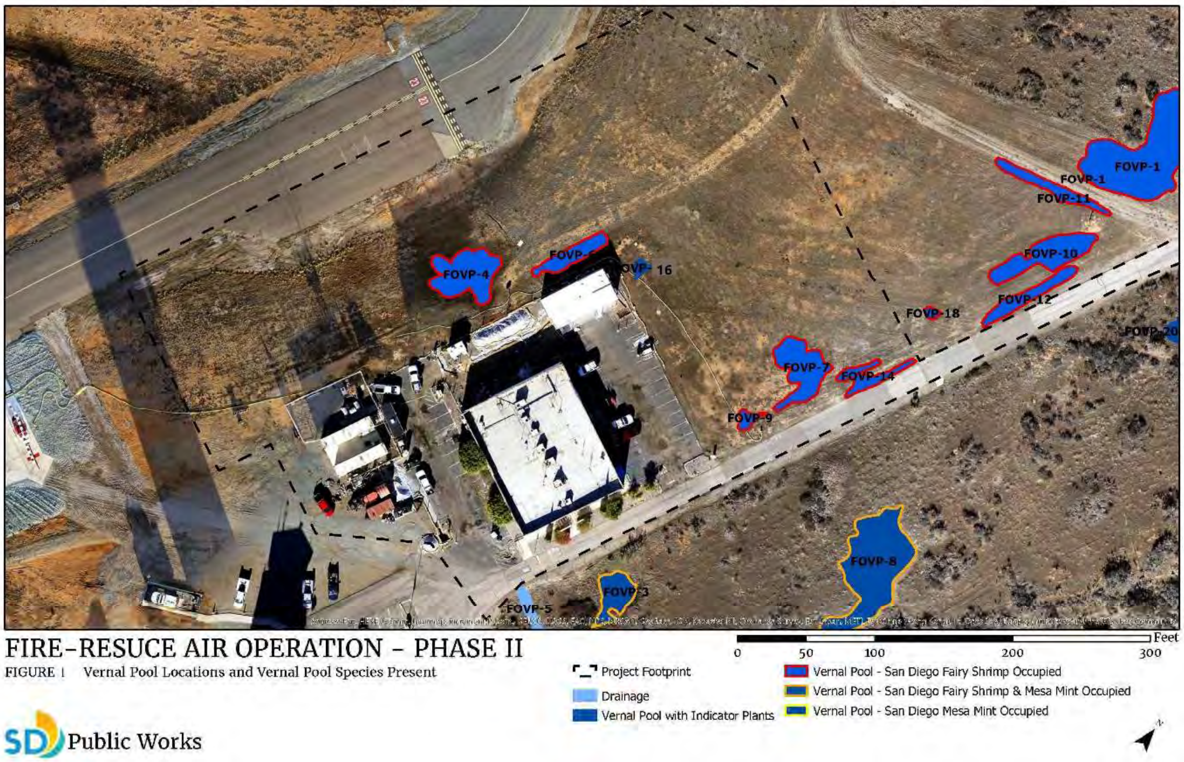


Figure 1. Vernal Pool locations and Species Present.

The project will mitigate impacts to vernal pools by restoring 0.178 acre of vernal pool basin that will support San Diego fairy shrimp within the South Otay 1-acre parcels (Figure 2). The South Otay 1-acre parcels total approximately 12-acres and are part of the larger J13 North Vernal pool complex on Otay Mesa. The South Otay 1-acre parcels are also within navarretia and San Diego fairy shrimp and navarretia designated critical habitat. The restoration will be done as part of a larger restoration effort to mitigate impacts from the current project and the proposed La Media Road Widening project.

Soil from nearby vernal pools containing San Diego and Riverside fairy shrimp cysts will be collected and used to inoculate all of the restored pools. Navarretia, button celery, Orcutt grass and mesa mint will also be planted/inoculated in the restored vernal pools. The proposed mitigation is consistent with the VPHCP conservation objectives to establish viable populations of Riverside fairy shrimp, navarretia, button celery, Orcutt's grass and mesa mint in the J13 vernal pool complex. The Service is currently working with the City to finalize the draft mitigation plan to include success criteria for San Diego fairy shrimp prior to the start of project construction.

Table 1: Onsite Vernal Pools to be Impacted

Vernal Pool	Acreage
FOVP #4	0.032
FOVP #6	0.013
FOVP #7	0.028
FOVP #9	0.003
FOVP #14	0.011
FOVP #16	0.002
Total	**0.089**

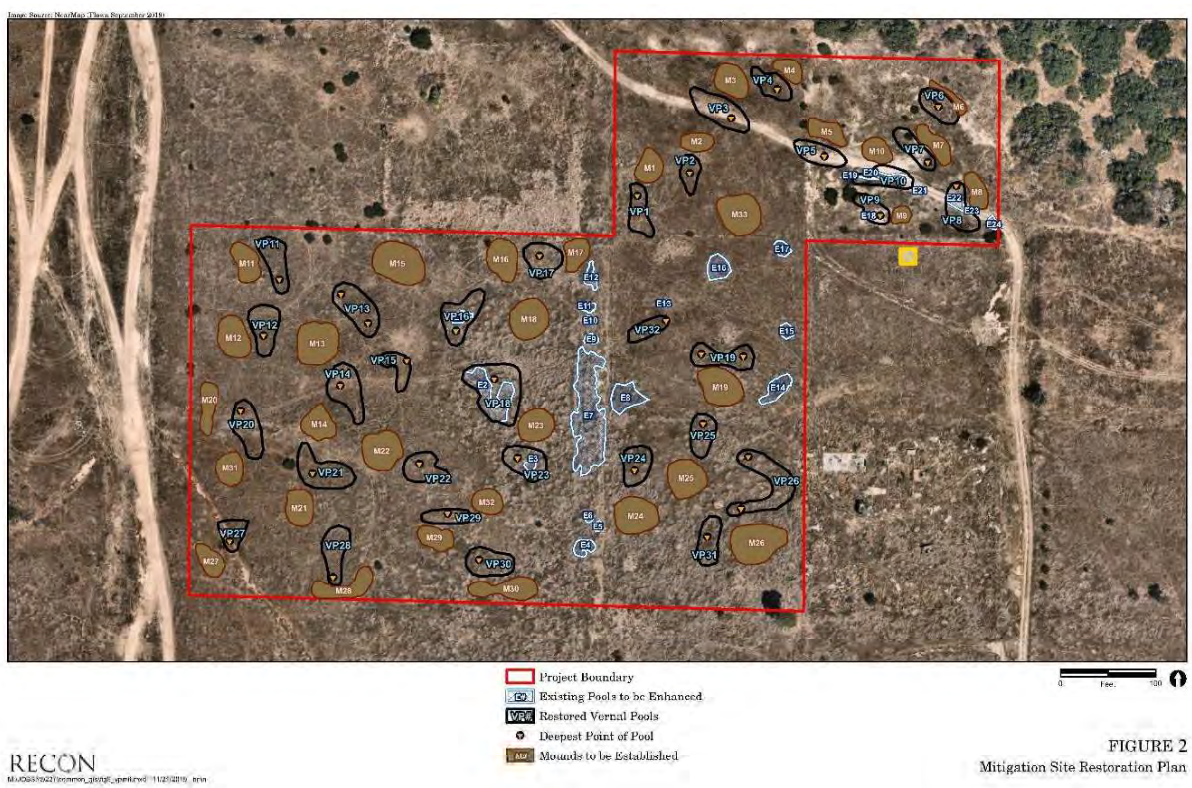


Figure 2. South Otay 1-acre Mitigation Site

Restoration activities (e.g., inoculum collection/placement, soil replacement, removal of nonnative plant species) and monitoring activities may adversely affect San Diego and Riverside fairy shrimp, button celery, navarretia, Orcutt grass and mesa mint. However, the benefits to these species associated with the restoration and monitoring are anticipated to result in an increase in the acreage and/or quality of vernal pool habitat occupied by these species and in designated critical habitat on the South Otay 1-acre parcels. The South Otay 1-acre parcels are already conserved and will be managed by the City consistent with the VPHCP.

The VPHCP was established to minimize and mitigate habitat loss and impacts to seven covered species in association with specific projects and activities covered by the plan. San Diego and Riverside fairy shrimp, button celery, navarretia, Orcutt grass and mesa mint are covered species under the VPHCP. On August 3, 2018, the Service issued an incidental take permit under section 10(a)(1)(B) of the Act to the City for their VPHCP.

The status of San Diego and Riverside fairy shrimp, button celery, navarretia, Orcutt grass, mesa mint and designated critical habitat and the effects of implementing the VPHCP were previously addressed in our 2018 biological opinion for issuance of an incidental take permit to the City. In the 2018 biological opinion, we concluded that the effects of the VPHCP and level of incidental take were not likely to jeopardize the continued existence of these species and were not likely to result in the destruction or adverse modification of their designated critical habitat. The project is consistent with the VPHCP and includes all applicable conservation measures in the VPHCP to avoid and minimize potential adverse effects to these species or their designated critical habitat. Therefore, we do not anticipate any incidental take and/or adverse effects to these species or their designated critical habitat that were not previously evaluated in our 2018 biological opinion, and no further consultation pursuant to the Act is necessary.

By this consultation, we are extending to the FAA the incidental take exemption for the San Diego and Riverside fairy shrimp already provided to the City through their incidental take permit for their VPHCP. Extension of this take exemption to the FAA is limited to the proposed action described in this biological opinion for activities that are consistent with the City's VPHCP and incidental take permit.

This concludes streamlined consultation on the proposed action. As provided in 50 CFR §402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the proposed action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any question regarding this streamlined consultation, please contact Patrick Gower of this office at 760-431-9440, extension 352.

Sincerely,

DAVID ZOUTENDYK

Digitally signed by DAVID ZOUTENDYK
Date: 2020.03.17 10:50:08 -07'00'

David A. Zoutendyk
Acting Assistant Field Supervisor

LITERATURE CITED

[City] City of San Diego. 1997. *Multiple Species Conservation Program: City of San Diego MSCP Subarea Plan.* 109+ pp.

[City] City of San Diego. 2017. *City of San Diego Vernal Pool Habitat Conservation Plan*. City of San Diego Planning Department. 316 pp.

[City] City of San Diego. 2019a. *Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II, San Diego, California Biological Resource Report.* 280 pp.

[City] City of San Diego. 2019b. *Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Hangers and Helicopter Parking Pad Project*, San Diego, California. 71 pp.

[Recon] Recon Environmental. 2019. *Vernal Pool Mitigation Plan for the La Media Road Widening & Fire Rescue Air Operations Phase II Project San Diego, California*. Prepared for City of San Diego Public Works Department. 58pp

[Service] U.S. Fish and Wildlife Service. 1997. *Intra-Service Biological and Conference Opinions on the Issuance of an Incidental Take Permit to the City of San Diego pursuant to the Multiple Species Conservation Program.*125 pp.

[Service] U.S. Fish and Wildlife Service. 2007. Designation of critical habitat for the San Diego Fairy Shrimp *(Branchinecta* sandiegonensis); final rule. Federal Register 72: 70648-70714.

[Service] U.S. Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for *Navarretia fossalis* (Spreading Navarretia); final rule. Federal Register 75: 62192-62255

[Service] U.S. Fish and Wildlife Service. 2018. *Intra-Service Formal Section 7 Consultation for Issuance of an Endangered Species Act Section 10(a)(1)(B) Permit (TE 97791C) for the City of San Diego Vernal Pool Habitat Conservation Plan, San Diego County, California*. 57 pp.

APPENDIX B
Historical Resources Survey

This page intentionally left blank

Historical Resources Survey for Phase II of the San Diego Fire-Rescue Air Operations Hangar Project (WBS #B-15012.02.02)

RECON

Prepared for
City of San Diego and Federal Aviation Administration

Submitted to
Platt/Whitelaw Architects, Inc.
4034 30th Street
San Diego, CA 92104
Contact: Mr. Thomas Brothers

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

RECON Number 9078
October 12, 2022

Carmen Zepeda-Herman

Carmen Zepeda-Herman, M.A., Project Archaeologist

ARCHAEOLOGICAL RESOURCE REPORT FORM

I. PROPOSED UNDERTAKING AND LOCATION

Phase II of the San Diego Fire-Rescue Air Operations (AirOps) Facility Project (project) would construct permanent helicopter hangars and support facilities at Montgomery-Gibbs Executive Airport. The project would support Phase I of the AirOps Facility Project that was completed in November 2019. Phase I consisted of interior remodeling and tenant improvements of the existing AirOps building. AirOps is a 24/7 365-day operating facility with no hangar space at Montgomery Field to support these operations. A feasibility study concluded that 30,000 square feet of hangar space is required to meet future needs of the AirOps fleet. Phase II would add helicopter hangars and support facilities to make the AirOps building improved under Phase I a fully operational fleet center for the Fire Department's helicopters and rapid fire response. The Area of Potential Effect (APE) is located in the northeastern corner of the airport in the Kearny Mesa community of the city of San Diego, California (Figure 1). The APE is within an unsectioned portion of the Mission San Diego landgrant on the U.S. Geological Survey 7.5-minute La Jolla quadrangle (Figure 2). The APE of temporary and permanent disturbance would consist of a 3.72-acre site east of Taxiway Charlie and the Taxiway Safety Area, located adjacent to the Air Traffic Control Tower between the Federal Aviation Administration (FAA) lease area, the Runway Object Free Area, and the Runway Protection Zone (RPZ) for the northwest approach to Runway 5/23 (Figure 3). Construction would be limited to the 3.72-acre project footprint to avoid impacts to additional natural areas and avoid interference with runway operations. Consequently, the project would not have a pre-defined temporary staging area, but would utilize various staging areas during the phased construction process in order to limit construction activities to the 3.72-acre project footprint. Entry to the APE would be via an asphalt road accessed from a security gate located off Ponderosa Avenue.

The project would include the following components:

- Construct approximately 32,000 square feet of prefabricated metal hangar that would contain a hangar support area for maintenance offices, over-haul, avionics, and storage rooms.

- Construct an approximately 65,000-square-foot concrete apron, to accommodate five helicopters.

- Construct parking and shelter for a single Heli-tender and two fueling tender vehicles.

- Relocate existing utility connections (Sewer, Stormwater, Gas, Water, Power, etc.) within the main access roadway from Ponderosa Avenue. Relocations would consist of trenching within the existing main access roadway and repaved. All relocation activities would be confined to the existing main access roadway and would not affect natural soils surrounding the main access roadway.

- Repair and resurface the main access road from Ponderosa Avenue to the FAA Air Traffic Control Tower and the new AirOps facility.

- Install storm water retention features that would capture runoff from the proposed improvements and an existing parking pad adjacent to the southern project boundary. The project would route all runoff from new impervious areas into a proposed permanent modular wetland for water quality and then into a proposed underground storage system for detention

> of the 100-year peak volumes. The modular wetland and underground storage system would be constructed as a part of the project. Captured peak runoff volumes from the six-hour, 100-year storm event would be pumped and hauled off for discharge into an acceptable Municipal Separate Storm Sewer System (MS4) that meets the requirements of the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266.

San Diego Fire-Rescue currently operates three helicopters: two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk. The proposed hangars are intended to accommodate these three existing helicopters, as well as one additional Lockheed Martin/SikorksyS70i Firehawk and one additional Bell 412. The project is anticipated to be awarded as a Design/Build contract, with a 12-month design phase and a 14-month construction phase. Additionally, mitigation for project impacts on vernal pools is anticipated to begin at the City's vernal pool mitigation bank in calendar year 2022 and be completed in calendar year 2023.

In the future condition, the Bell 412 helicopters would take off and land from the existing concrete parking pad, while the Lockheed Martin/SikorskyS70i Firehawks would taxi from the proposed hangars along Taxiway Charlie to take off from Runway 5/23. The Lockheed Martin/SikorskyS70i Firehawks would also land at Runway 5/23 and taxi back to the proposed hangars along Taxiway Charlie.

II. SETTING

Natural Environment (Past and Present)

The project is located within the Montgomery-Gibbs Executive Airport on a portion of Kearny Mesa. The project elevation is approximately 420 feet above mean sea level (AMSL). Murphy Canyon is located east of the airport and Mission Valley is southeast. Residential and commercial development occurs surrounding the airport. The APE is covered in non-native weeds and grasses with some scattered buckwheat bushes.

The soil in the APE consists of Redding gravelly loam (RdC), 2 to 9 percent slopes. The Redding gravelly loam is gently rolling with low hummocks or mima mounds. The Redding series consists of well-drained, undulating to steep gravelly loams that have a gravelly clay subsoil and a hardpan. These soils formed in old mixed cobbly and gravelly alluvium. They are located on dissected terraces (U.S. Department of Agriculture 2022).

Ethnography/History

The prehistoric cultural sequence in San Diego County is generally conceived as comprising three basic periods: the Paleoindian, dated between about 11,500 and 8,500 years ago and manifested by the artifacts of the San Dieguito Complex; the Archaic, lasting from about 8,500 to 1,500 years ago (A.D. 500) and manifested by the cobble and core technology of the La Jollan Complex; and the Late Prehistoric, lasting from about 1,500 years ago to historic contact (i.e., A.D. 500 to 1769) and represented by the Cuyamaca Complex. This latest complex is marked by the appearance of ceramics, small arrow points, and cremation burial practices.

The Paleoindian Period in San Diego County is most closely associated with the San Dieguito Complex, as identified by Rogers (1938, 1939, 1945). The San Dieguito assemblage consists of well-made scraper planes, choppers, scraping tools, crescentics, elongated bifacial knives, and leaf-shaped points. The San Dieguito Complex is thought to represent an early emphasis on hunting (Warren et al. 1993:III-33).

The Archaic Period in coastal San Diego County is represented by the La Jolla Complex, a local manifestation of the widespread Millingstone Horizon. This period brings an apparent shift toward a more generalized economy and an increased emphasis on seed resources, small game, and shellfish. The local cultural manifestations of the Archaic Period are called the La Jolla Complex along the coast and the Pauma Complex inland. Pauma Complex sites lack the shell that dominates many La Jollan sites. Along with an economic focus on gathering plant resources, the settlement system appears to have been more sedentary. The La Jollan assemblage is dominated by rough, cobble-based choppers and scrapers, and slab and basin metates. Elko series projectile points appeared by about 3,500 years ago. Large deposits of marine shell at coastal sites argue for the importance of shellfish gathering to the coastal Archaic economy.

Near the coast and in the Peninsular Mountains beginning approximately 1,500 years ago, patterns began to emerge that suggest the ethnohistoric Kumeyaay. The Late Prehistoric Period is characterized by higher population densities and elaborations in social, political, and technological systems. Economic systems diversify and intensify during this period, with the continued elaboration of trade networks, the use of shell-bead currency, and the appearance of more labor-intensive but effective technological innovations. The late prehistoric archaeology of the San Diego coast and foothills is characterized by the Cuyamaca Complex. It is primarily known from the work of D. L. True at Cuyamaca Rancho State Park (True 1970). The Cuyamaca Complex is characterized by the presence of steatite arrowshaft straighteners, steatite pendants, steatite comales (heating stones), Tizon Brown ware pottery, ceramic figurines reminiscent of Hohokam styles, ceramic "Yuman bow pipes," ceramic rattles, miniature pottery, various cobble-based tools (e.g., scrapers, choppers, hammerstones), bone awls, manos and metates, mortars and pestles, and Desert Side-Notched (more common) and Cottonwood Series projectile points.

Ethnohistory

The Kumeyaay (also known as Kamia, Ipai, Tipai, and Diegueño) occupied the southern two-thirds of San Diego County. The Kumeyaay lived in semi-sedentary, politically autonomous villages or rancherias. Settlement system typically consisted of two or more seasonal villages with temporary camps radiating away from these central places (Cline 1984a and 1984b). Their economic system consisted of hunting and gathering, with a focus on small game, acorns, grass seeds, and other plant resources. The most basic social and economic unit was the patrilocal extended family. A wide range of tools was made of locally available and imported materials. A simple shoulder-height bow was utilized for hunting. Numerous other flaked stone tools were made including scrapers, choppers, flake-based cutting tools, and biface knives. Preferred stone types were locally available metavolcanics, cherts, and quartz. Obsidian was imported from the deserts to the north and east. Ground stone objects include mortars, manos, metates, and pestles typically made of locally available, fine-grained granite. Both portable and bedrock types are known. The Kumeyaay made fine baskets using either coiled or twined construction. The Kumeyaay also made pottery, utilizing the paddle-and-anvil technique. Most were a plain brown utility ware called Tizon Brown ware, but some were decorated (Meighan 1954; May 1976, 1978).

Spanish/Mexican/American Periods

The Spanish Period (1769–1821) represents a time of European exploration and settlement. Military and naval forces along with a religious contingent founded the San Diego Presidio, the pueblo of San Diego, and the San Diego Mission in 1769 (Rolle 1998). The mission system used forced Native American labor and introduced horses, cattle, other agricultural goods, and implements. Native American culture in the coastal strip of California rapidly deteriorated despite repeated attempts to revolt against the Spanish invaders (Cook 1976). One of the hallmarks of the Spanish colonial scheme was the rancho system. In an attempt to encourage settlement and development of the colonies, large land grants were made to meritorious or well-connected individuals.

In 1821, Mexico declared its independence from Spain. During the Mexican Period (1822–1848), the mission system was secularized by the Mexican government and these lands allowed for the dramatic expansion of the rancho system. The southern California economy became increasingly based on cattle ranching.

The Mexican Period came to a close when Mexico signed the Treaty of Guadalupe Hidalgo on February 2, 1848, concluding the Mexican–American War (1846–1848; Rolle 1998). Just prior to the signing of the Treaty of Guadalupe Hidalgo, gold was discovered in the northern California Sierra-Nevada foothills, the news was published on March 15, 1848, and the California Gold Rush began. The great influx of Americans and Europeans eliminated many remaining vestiges of Native American culture. California became a state in 1850.

The American homestead system encouraged settlement beyond the coastal plain into areas where Indians had retreated to avoid the worst of Spanish and Mexican influences (Carrico 1987; Cook 1976). A rural community cultural pattern existed in San Diego County from approximately 1870 to 1930. These communities were composed of an aggregate of people who lived on scattered farmsteads tied together through a common school district, church, post office, and country store (Hector and Van Wormer 1986; Pourade 1963).

The U.S. Army acquired 12,721 acres of what is now Kearny Mesa in 1917 to establish Camp Kearny, to be used as a mobilization and training camp for soldiers going to fight in Europe in World War I. Although not constructed during World War I, an airfield was established at Camp Kearny prior to its closure as an active army camp in 1920 and continued to be used through the 1920s and 1930s. The U.S. Navy began an expansion program at Camp Kearny in 1940, and the base was commissioned as Naval Auxiliary Air Station Camp Kearny in 1943. Concurrently with Navy use, the U.S. Marine Corps began using a portion of the base for maneuvers and gunnery ranges. During World War II, the Marine Corps also used the northern portion of Camp Kearny to process Marine squadrons en route to the South Pacific. In 1946, the Navy departed Camp Kearny, but returned when the Marines moved to Marine Corps Air Station El Toro in 1947. The Marines returned in 1993, when the base was transferred back to the Marines.

Montgomery Airport was established in 1937 by William Gibbs. Initially known as Gibbs Field, Gibbs leased the field to Ryan School of Aeronautics for the training of U.S. Army Air Corps cadets in 1940 (City of San Diego 2016). The City of San Diego purchased the field from Gibbs in 1947, and in 1950 renamed it Montgomery Field, in honor of pioneer aviator John J. Montgomery.

Prior to the 1950s there was little non-military development on Kearny Mesa. This changed significantly in the later 1950s and 1960s. Substantial residential developments were constructed south and west of the project during this time. The area east of Interstate 805 took longer to develop, and when it did was predominately commercial, industrial, and research and development companies.

III. AREA OF POTENTIAL EFFECT (APE)

The APE encompasses approximately 3.72 acres as shown in Figure 3 and was determined based upon the extent of vertical and horizontal ground-disturbing activities. The APE would include a maximum excavation of four feet for the proposed hangars and water retention features and eight feet for the proposed utility lines within the access route from Ponderosa Avenue. The maximum height of the proposed hangars would be 42 feet.

IV. STUDY METHODS

The cultural resources survey included both an archival search and an on-site foot survey of the APE. A records search of the APE with a one-mile radius buffer was requested from the South Coastal Information Center (SCIC) at San Diego State University in order to determine if previously recorded prehistoric or historic cultural resources occur on the APE.

A letter was sent to the Native American Heritage Commission (NAHC) on May 22, 2018, and again on May 30, 2019, requesting them to search their files to identify spiritually significant and/or sacred sites or traditional use areas in the project vicinity. The NAHC was also asked to provide a list of local Native American tribes, bands, or individuals who may have concerns or interests in the cultural resources of the project (Appendix A).

The field survey was conducted on June 13, 2018, by RECON archaeologist Harry Price accompanied by Kaci Brown, a Native American representative from Red Tail Environmental. The access road was not surveyed because of the lack of surface visibility (see Figure 3). The spacing between the field personnel was 6 meters. The survey area was inspected for evidence of archaeological materials such as flaked and ground stone tools, ceramics, milling features, and historic features. Photographs were taken to document the environmental setting and general conditions.

V. RESULTS OF STUDY

The record search of the APE with a one-mile radius buffer indicated that there have been 43 cultural resources investigations and 3 recorded historic-era cultural resources, 1 prehistoric cultural resource, and 1 prehistoric isolated artifact within one mile of the proposed APE (Confidential Appendix). The prehistoric resource consisted of a lithic and shell scatter. The historic resources consist of industrial and commercial buildings. None of these resources are located within the proposed APE. A total of three historic addresses have been recorded within the one-mile search radius, none of which are within the proposed APE.

The results received from the NAHC on June 14, 2019 were positive. The NAHC indicated that the Viejas Band of Kumeyaay Indians should be contacted for further information (see Appendix A).

In accordance with Section 106 of the National Historic Preservation Act, the FAA conducted government-to-government tribal consultation. The FAA sent consultation initiation letters to 11 tribes on various dates (Table 1; Appendix B). Of these tribes, three responded. The Campo Band indicated that the area is rich in history for the Kumeyaay people and requested cultural monitors from Campo be present during future surveys and ground disturbing activities. The Viejas Band indicated that the APE may contain sacred sites to the Kumeyaay people and requested those sites be avoided with adequate buffer zones. Additionally, the Viejas Band stated that the APE has cultural significance to Viejas and requested a Kumeyaay Cultural Monitor be on site for ground disturbing activities. The San Pasqual Band requested extreme care be taken during excavation due to the possibility of disturbing cultural resources and indicated that Kumeyaay monitors would be present during the excavation phase of the project.

Table 1 Section 106 Tribal Consultation Summary		
Tribe	Consultation Initiation letter	Response
Campo Band of Diegueno Mission Indians	October 6, 2018	November 14, 2018
Ewiiaapaayp Band of Kumeyaay Indians	October 6, 2018	
Iipay Nation of Santa Ysabel	October 6, 2018	
Jamul Indian Village	October 6, 2018	
La Posta Band of Mission Indians	October 6, 2018	
Manzanita Band of Kumeyaay Indians	October 6, 2018	
Sycuan Band of Kumeyaay Nation	October 6, 2018	
Viejas Band of Kumeyaay Indians	October 6, 2018	November 18, 2018; July 31, 2019
Kwaaymii Laguna Band of Mission Indians	November 6, 2018	
Kumeyaay Cultural Repatriation Committee	November 6, 2018; June 18, 2019	
San Pasqual Band of Diegueno Mission Indians	July 18, 2019	July 23, 2019

As follow-up to the Viejas Band response, the FAA emailed Mr. Ray Teran on April 30, 2020 asking if there is a sacred site within the APE and for the appropriate contact information for the Viejas monitor. On August 23, 2021, the FAA again emailed Mr. Ray Teran and Mr. Ernest Pingleton asking about location of sacred sites.

The pedestrian survey resulted in finding no cultural material. Survey conditions consisted of clear skies, bright sunlight, and a slight breeze with a temperature of approximately 75 degrees. The APE is mowed on a regular basis for weed control, increasing ground visibility. Ground visibility averaged 70 percent (Photograph 1). Large patches of reddish sandstone and cobble lenses cover the ground surface in much of the survey area (Photograph 2). The APE has been scraped in the past, probably for the initial brushing of the area, exposing subsoils. Numerous broken cobbles were noted on the surface. The cobbles were likely broken as a result of past scraping and mowing and/or from natural fracturing. Surface gravel and small amounts of concrete and asphalt pieces were in the area between the existing control tower and the runway. The large landing pad at the southwest end of the survey area was not surveyed, as well as the taxi lane along the western edge of the survey area because the ground surface is covered by either asphalt or concrete in both these locations.

VI. RECOMMENDATIONS

No cultural resources were identified in the APE. The project will not result in indirect effects, including noise pollution, to any historic properties because the addition of helicopter noise will not significantly increase or change the existing noise levels for the use of nearby runways.

The cultural resource investigations summarized herein satisfy the requirements of the FAA to take into account the effects of an undertaking on historic properties as defined in Section 106 of the National Historic Preservation Act, as implemented (36 Code of Federal Regulations Part 800). As such, the efforts to identify and document historic properties in the project APE reveal that the project will have no impact on prehistoric cultural resources and thus, the undertaking will result in no historic properties affected

The possibility of significant historic properties being present within the project is considered low. The topsoil within the APE has been scraped away in the past, leaving no suitable areas where potentially significant prehistoric or historic cultural resources could be present. However, based on the request from the tribes for monitoring, RECON recommends construction monitoring by a qualified archaeologist and Native American monitor.

VII. SOURCES CONSULTED — DATE

National Register of Historic Places ☑	Month and Year: July 2018
California Register of Historical Resources ☑	Month and Year: July 2018
City of San Diego Historical Resources Register ☑	Month and Year: July 2018
Archaeological/Historical Site Records: South Coastal Information Center ☑	Month and Year: June 2018

Other Sources Consulted:

VIII. CERTIFICATION

Preparer: Carmen Zepeda-Herman, M.A.	Title: Principal Investigator
Signature: Carmen Zepeda-Herman	Date: October 12, 2022

IX. ATTACHMENTS

Bibliography
Attached

National Archaeological Data Base Information
Attached

Maps (include all of the following maps.)

Figure 1: Regional Location
Figure 2: Project Location on USGS Map
Figure 3: Area of Potential Effect on Aerial Photograph

Photographs

Photograph 1: Typical Ground Cover, Looking East from the Runway
Photograph 2: Exposed Subsoil, Looking North-northeast with Runway on the Left and FAA Building on the Right

Personnel Qualifications
Resume for Principal Investigator (Appendix C).

X. APPENDICES

Native American Heritage Commission Correspondence (Appendix A)
Letter dated June 14, 2019

FAA Tribal Consultation Correspondence (Appendix B)

Resume for Principal Investigator (Appendix C)

Record search results (Confidential Appendix)
Records search results from South Coastal Information Center.

New or updated historical resource records
None.

BIBLIOGRAPHY

Carrico, Richard L.
1987 *Strangers in a Stolen Land. American Indians in San Diego 1850-1880.* Sierra Oaks Publishing, Newcastle, California.

Cline, Lora L.
1984a *Just Before Dawn.* L. C. Enterprises, Tombstone, Arizona.

1984b *Just Before Sunset.* J and L Enterprises, Jacumba, California.

Cook, Sherburne F.
1976 *The Population of California Indians, 1769-1970*. Berkeley: University of California Press.

Hector, Susan M., and Stephen R. Van Wormer
1986 Broken Fragments of Past Lifeways: Archaeological Excavations at Los Peñasquitos Ranch House, Volumes I and II. RECON.

May, Ronald V.
1976 An Early Ceramic Date Threshold in Southern California. *Masterkey* 50(3):103-107.

1978 A Southern California Indigenous Ceramic Typology: A Contribution to Malcolm J. Rogers Research. *ASA Journal* 2:2.

Meighan, Clement W.
1954 A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10:215-227.

Pourade, Richard F. (editor)
1963 *The Silver Dons.* The History of San Diego. Union-Tribune Publishing, San Diego, California.

Rogers, Malcolm J.
1938 Archaeological and Geological Investigations of the Culture Levels in an Old Channel of San Dieguito Valley. *Carnegie Institution of Washington Yearbook* 37:344-45.

1939 Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas. *San Diego Museum of Man Papers* 3.

1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1(2):167-198. Albuquerque.

Rolle, Andrew
1998 *California: A History.* Harlan Davidson, Inc. Wheeling, Illinois.

San Diego, City of
2016 Montgomery-Gibbs Executive Airport. Accessed on July 9, 2018. Available at https://www.sandiego.gov/airports/montgomery.

True, Delbert L.
1970 *Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California.* Department of Anthropology Publications, University of California, Los Angeles.

U.S. Department of Agriculture (USDA)
2022 Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed June 21, 2022.

Warren, Claude N., Gretchen Siegler, and Frank Dittmer
1993 Paleoindian and Early Archaic Periods. In Historic Properties Background Study for the City of San Diego Clean Waste Program. On file with Mooney and Associates.

NATIONAL ARCHAEOLOGICAL DATA BASE INFORMATION

Authors:	Carmen Zepeda-Herman, RPA
Consulting Firm:	RECON Environmental 3111 Camino del Rio North. Suite 600 San Diego, CA 92108
Report Date:	October 12, 2022
Report Title:	Historical Resources Survey for the City of San Diego Proposed Fire-Rescue Air Ops Hangar Project, San Diego, California
Prepared for:	City of San Diego and Federal Aviation Administration
Submitted to:	Thomas Brothers Platt/Whitelaw Architects, Inc. 4034 30th Street San Diego, California 92104
Contract Number:	RECON 9078
USGS Quadrangle Map:	La Jolla Quadrangle
Keywords:	Negative survey, Montgomery Field

ABSTRACT

A cultural resources survey was conducted for the San Diego Fire-Rescue Air Ops Hangar project within the Montgomery-Gibbs Executive Airport in the City of San Diego. The survey included a records search at the South Coastal Information Center and a sacred lands search from the Native American Heritage Commission. Three historic-era cultural resources, one prehistoric cultural resource, one prehistoric isolated artifact, and three historic addresses have been recorded within a one-mile radius of the project. None of the previously recorded cultural resources are within the project APE. The Native American Heritage Commission files indicated that no sites have been located within the APE.

A RECON archaeologist and Native American monitor from Red Tail Monitoring and Research completed a field survey on June 13, 2018. No cultural resources were identified. The possibility of significant historical resources being present within the project is considered low. The topsoil within the APE has been scraped away in the past, leaving no suitable areas where potentially significant prehistoric or historic cultural resources could be present. However, based on the request from the tribes for monitoring, RECON recommends construction monitoring by a qualified archaeologist and Native American monitor.

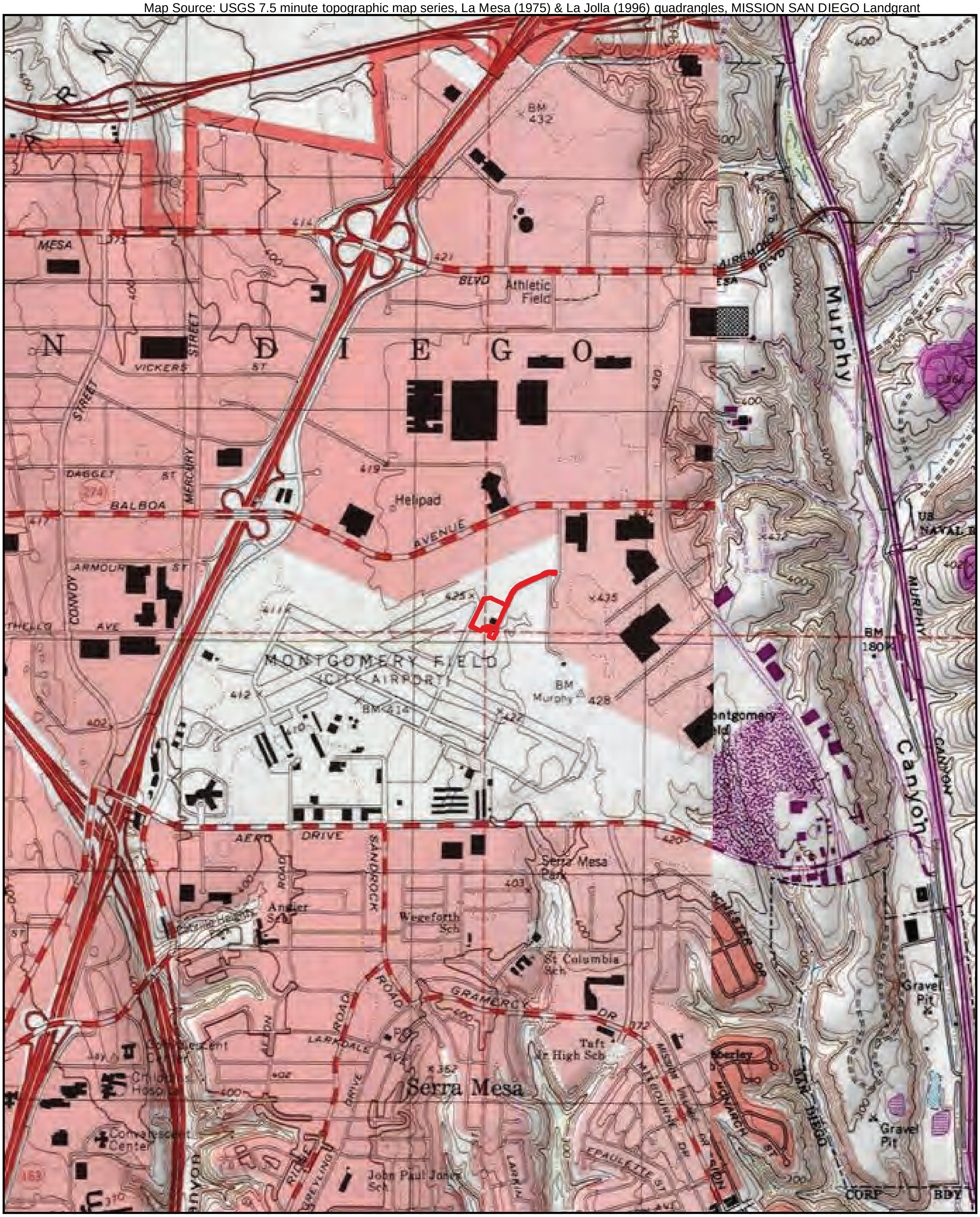
Project Location

FIGURE 1
Regional Location

RECON

M:\JOBS5\9078\common_gis\fig1_FAA.mxd 7/7/2022 fmm

Map Source: USGS 7.5 minute topographic map series, La Mesa (1975) & La Jolla (1996) quadrangles, MISSION SAN DIEGO Landgrant



0 Feet 2,000

Area of Potential Effect

RECON

FIGURE 2
Area of Potential Effect on USGS Map

M:\JOBS5\9078\common_gis\fig2_FAA.mxd 7/7/2022 fmm

Image Source: Nearmap (flown April 2022)

FIGURE 3

Area of Potential Effect on Aerial Photograph

RECON

M:\JOBS5\9078\common_gis\fig3_FAA.mxd 7/7/2022 fmm

PHOTOGRAPH 1
Typical Ground Cover, Looking East from the Runway

PHOTOGRAPH 2
Exposed Subsoil, Looking North-Northeast with Runway on the Left and FAA Building on the Right

APPENDIX A

Native American Heritage Commission Correspondence

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

June 14, 2019

Carmen Zepeda-Herman
RECON Environmental

VIA Email to: czepeda@reconenvironmental.com

RE: San Diego Fire Rescue Air Ops Project, San Diego County

Dear Ms. Zepeda-Herman:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Viejas Band of Kumeyaay Indians on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: steven.quinn@nahc.ca.gov.

Sincerely,

Steven Quinn
Associate Governmental Program Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Diego County
6/14/2019

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribe
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Tribe
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
cjlinton73@aol.com

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Kwaaymii
Pine Valley, CA, 91962 — Diegueno
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed San Diego Fire Rescue Air Ops Project, San Diego County.

Native American Heritage Commission
Native American Contact List
San Diego County
6/14/2019

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

San Pasqual Band of Diegueno Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Sycuan Band of the Kumeyaay Nation
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 312 - 1935
lhaws@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road — Dieguen‍o
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

Viejas Band of Kumeyaay Indians
Ernest Pingleton, Tribal Historic Officer, Resource Management
1 Viejas Grade Road — Diegueno
Alpine, CA, 91901
Phone: (619) 659 - 2314
epingleton@viejas-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed San Diego Fire Rescue Air Ops Project, San Diego County.

APPENDIX B

FAA Tribal Consultation Correspondence

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Cody J. Martinez
Chairperson
Sycuan Band of Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, California 92019

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairman Martinez:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
Lisa Haws, Cultural Resources Manager, Sycuan Band of Kumeyaay Nation

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Ralph Goff
Chairperson
Campo Band of Diegueno Mission Indians
36190 Church Road, Suite 1
Campo, California 91906

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairman Goff:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120' x 120') concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

for Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

Campo Band of Mission Indians

Chairman Ralph Goff
Vice-Chairman Harry P. Cuero Jr.
Secretary Kerm Shipp
Treasurer Marcus Cuero
Committee Brian Connolly Sr.
Committee Steven M. Cuero
Committee Benjamin Dyche

November 14, 2018

Gail Campos

Environmental Protection Specialist

US Department of Transportation, Federal Aviation Administration

Western-Pacific Region Office of Airports

777 South Aviation Boulevard, Suite 150

El Segundo, CA 90245

Dear Ms. Campos

Subject: Proposed Fire Rescue Facility and Parking Pad Expansions, Montgomery Field Airport

After review of Proposed Fire Rescue Facility and Parking Pad Expansions, Montgomery Field Airport project, Campo Band of Mission Indians concludes these areas have a rich history for the Kumeyaay people. There were many villages throughout the Kumeyaay territory. Much of that history was lost when the Kumeyaay people were relocated to other areas. Campo Band of Mission Indians requests to have cultural monitors from Campo be present for all future surveys and ground disturbing activities, to ensure Kumeyaay cultural resource are not overlooked. Please feel free to contact Marcus Cuero at marcuscuero@campo-nsn.gov or by phone (619) 478-9046, if you have questions or concerns.

Sincerely,

Ralph Goff

Chairman

Campo Band of Mission Indians

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Robert Pinto
Chairperson
Ewiiaapaayp Band of Kumeyaay Indians
4054 Willows Road
Alpine, California 91901

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairman Pinto:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
Michael Garcia, Vice Chairperson, Ewiiaapaayp Band of Kumeyaay Indians

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Robert J. Welch
Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Road
Alpine, California 91901

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairman Welch:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

for Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
Julie Hagen, Cultural Resources, Viejas Band of Kumeyaay Indians

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

VIEJAS
TRIBAL GOVERNMENT

P.O. Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

November 19, 2018

Gail M. Campos
Environmental Protection Specialist
Federal Aviation Administration
777 S. Aviation Blvd. Suite 150
El Segundo, CA 90245

RE: Proposed Fire Rescue Facility and Parking Pad Expansions

Dear Ms. Campos,

In reviewing the above referenced project the Viejas Band of Kumeyaay Indians ("Viejas") would like to comment at this time.

The project area may contain many sacred sites to the Kumeyaay people. We request that these sacred sites be avoided with adequate buffer zones.

Additionally, Viejas is requesting, as appropriate, the following:

- All NEPA/CEQA/NAGPRA laws be followed
- Immediately contact Viejas on any changes or inadvertent discoveries.

Thank you for your collaboration and support in preserving our Tribal cultural resources. I look forward to hearing from you. Please call me at 619-659-2312 or Ernest Pingleton at 619-659-2314, or email, rteran@viejas-nsn.gov or epingleton@viejas-nsn.gov, for scheduling. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

VIEJAS
TRIBAL GOVERNMENT

P.O. Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 619.445.3810
Fax: 619.445.5337
viejas.com

July 23, 2019

Gail M. Campos
Environmental Protection Specialist
US DOT, FAA
777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

RE: Parking Pad Expansion, Montgomery Field Airport Project

Dear Ms. Campos,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

Please call me at 619-659-2312 or Ernest Pingleton at 619-659-2314 or email, rteran@viejas-nsn.gov or epingleton@viejas-nsn.gov , for scheduling. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

From: Campos, Gail (FAA)
To: Ray Teran
Cc: epingleton@viejas-nsn.gov
Subject: Montgomery Field Airport Parking Pad Expansion
Date: Thursday, April 30, 2020 7:35:00 PM
Attachments: MYF Fire Extension Nat Am Tribal Govt to Govt JChristman letter 07172019.pdf

Mr. Teran,

I am contacting you regarding the parking pad expansion project at Montgomery Field Airport. We had sent out letters regarding this project on October 6, 2018 and July 23, 2019. You had responded to our letters on November 19, 2018 and July 12, 2019. In the November 19, 2018 letter you stated that the area may contain sacred sites and requested that these sites be avoided. I would like to get more information regarding the sacred sites location so that they be avoided. Are these sites located in the area of potential affect (APE) or project area as depicted on the map enclosed with the letter?

You had also requested to have a Kumeyaay Cultural Monitor be on site during ground disturbing activities. The City of San Diego and the FAA have almost completed our environmental document for this project and I know the City would like to break ground as soon as possible. Therefore, I wanted to let you know that this project could go to construction in the month of May. Are you the contact for the monitor? If not, please send me the contact information for the monitor.

Thank you

Gail Campos
Environmental Protection Specialist
Federal Aviation Administration
Los Angeles Airports District Office
777 Aviation Boulevard, Suite 150
El Segundo, CA 90245
424-405-7269
gail.campos@faa.gov

From:	Campos, Gail (FAA)
To:	Ray Teran; Ernest Pingleton
Subject:	Fire Rescue Facility Expansion at Montgomery Field Airport
Date:	Monday, August 23, 2021 12:43:00 PM

Mr. Teran and Mr. Pingleton,

I am working with the City of San Diego to complete the proposed Fire Rescue Facility Expansion project at Montgomery Field Airport. I received a letter dated November 19, 2018, stating that "The project area may contain many sacred sites to the Kumeyaay people. We request that these sacred sites be avoided with adequate buffer zones." I have notes where we have reached out to discuss how to avoid and buffer these sites, however, I do not have record on us having the discussion. Can you please send me some dates and times that you would be available so that we can discuss this issue.

Thank you

Gail Campos
Environmental Protection Specialist
Federal Aviation Administration
Los Angeles Airports District Office
777 South Aviation Boulevard, Suite 150
El Segundo, CA 90245
424-405-7269
gail.campos@faa.gov

U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Angela Elliott Santos
Chairperson
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, California 91905

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairwoman Santos:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

for Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Erica Pinto
Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, California 91935

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairwoman Pinto:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
Lisa Cumper, Tribal Historic Preservation Officer, Jamul Indian Village

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Gwendolyn Parada
Chairperson
La Posta Band of Mission Indians
8 ½ Crestwood Road
Boulevard, California 91905

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairwoman Parada:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
Javaughn Miller, Tribal Administrator, La Posta Band of Mission Indians

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S Department of Transportation

Federal Aviation Administration

Memorandum

Western-Pacific Region
Office of Airports
777 South Aviation Blvd., Suite # 150
El Segundo, CA 90245

Subject: **Montgomery Field Airport- Proposed Fire Rescue Facility and Parking Pad Expansion Native American Government-to-Government Consultation**

Date: October 5, 2018

From: Gail Campos, LAX-600.2

Reply to Attn. of: Gail Campos, LAX-600.2

To: Grid Signatories

Attached is a draft copy of the proposed Montgomery Field Airport - Proposed Fire Rescue Facility and Parking Pad Expansion Environmental Assessment Native American Government-to-Government Consultation. Please review, make any changes and initial off on the grid. The following tribes will be consulted with for this project:

Campo Band of Diegueno Mission Indians
Ewiiaapaayp Band of Kumeyaay Indians
Iipay Nation of Santa Ysabel
Jamul Indian Village
La Posta Band of Diegueno Mission Indians
Manzanita Band of Kumeyaay Nation
Sycuan Band of the Kumeyaay Nation
Viejas Band of Kumeyaay Indians

In order to save paper, I am only printing one copy until the correspondence is ready for Mark's signature

Gail Campos, LAX-600.2

Attachments

CONCURRENCES

ROUTING SYMBOL	INITIALS/SIG	DATE
LAX-600.2	gmc	10/5/18
LAX-601	MW MW	10/10/18
LAX-600	[illegible]	10/10/18
AWP-610.1	DJK	10/31/2018
AWP-610	R. D	11/1/18
AWP-601	for [illegible]	11/06/18
AWP-600	for [illegible]	11/06/18

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

OCT 0 6 2018

Virgil Perez
Chairperson
Iipay Nation of Santa Ysabel
P.O. Box 130
Santa Ysabel, California 92070

Proposed Fire Rescue Facility and Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairperson Perez:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Fire Rescue Air Operations Center and Parking Pad Expansions Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports
Los Angeles Airports District Office

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

November 6, 2018

Clint Linton
Director of Cultural Resources
Kumeyaay Cultural Repatriation Committee
P.O. Box 507
Santa Ysabel, California 92070

Dear Mr. Linton:

Proposed Fire Rescue Facility and Parking Pad Expansions
San Diego, San Diego County, California
Native American Consultation Initiation

The Federal Aviation Administration (FAA) and the City of San Diego (City) are preparing environmental documents evaluating the potential impacts resulting from the construction and operation of various proposed improvements at Montgomery Field Airport. The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Native American consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed project will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90 foot (ft.) x 90 ft.) concrete parking pad with a crushed rock border would be expanded to a 14,400 sf (120 ft. x 120 ft.) concrete pad, with a 30 ft. border of 2 inch crushed rock on the north and east ends. This will require an existing 5 ft. wide by 5 ft. long by 4 ft. deep fiber line vault to be relocated approximately 25 ft. to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide by 3 ft. deep by 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

If you wish to provide comments related to this proposed project, please contact me, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov.

Sincerely,

Gail Campos

Gail Campos
Environmental Protection Specialist

1 Enclosure

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports
Los Angeles Airports District Office

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

November 6, 2018

Carmen Lucas
Kwaaymil Laguna Band of Mission Indians
P.O. Box 775
Pine Valley, California 91962

Dear Ms. Lucas:

Proposed Fire Rescue Facility and Parking Pad Expansions
San Diego, San Diego County, California
Native American Consultation Initiation

The Federal Aviation Administration (FAA) and the City of San Diego (City) are preparing environmental documents evaluating the potential impacts resulting from the construction and operation of various proposed improvements at Montgomery Field Airport. The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Native American consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The proposed undertaking will expand the current Fire Rescue Air Operations Center by adding 32,000 square foot (sf) of hangar space, 65,000 sf of concrete apron, a 7,500 sf taxilane, two 12,000-gallon capacity above ground fuel storage tanks, parking, and a shelter for a Helitender, and two fueling tender vehicles. The new hangar space includes offices, overhaul and avionics maintenance area, and storage rooms. The existing 8,100 sf (90' x90') concrete parking pad and crushed rock border parking pad would be expanded to 14,400 sf (120' x 120') concrete pad, with a 30ft border of 2" crushed rock on the north and east ends. This will require an existing 5' x 5' x 4' fiber line vault to be relocated approximately 25 feet (ft.) to the east. The trench from the existing vault location to the new location would be approximately 2 ft. wide, 3 ft. deep, and 25 ft. long. Construction related damages to the access road from Ponderosa Avenue to the project site would be repaired with a two-inch overlay of asphalt material on the damaged areas. The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The proposed undertaking would occur on existing airport property. Enclosed is an exhibit that shows the Area of Potential Effect to help illustrate where the proposed undertaking is located.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

If you wish to provide comments related to this proposed project, please contact me, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov.

Sincerely,

Gail Campos

Gail Campos
Environmental Protection Specialist

1 Enclosure

Figure 1: Improvements and APE
Fire Rescue Air Operations Phase II & Parking Pad

U.S. Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

JUL 18 2019

Allen E. Lawson
Chairperson
San Pasqual Band of Diegueno Mission Indians
P.O. Box 365
Valley Center, California 92082

Proposed Parking Pad Expansions
Montgomery Field Airport
San Diego, California,
Government-to-Government Consultation Initiation

Dear Chairman Lawson:

Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) and the City San Diego (City) are preparing environmental documentation evaluating the potential impacts resulting from the proposed Parking Pad Expansion at Montgomery Field Airport (Airport). The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Government-to-Government consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Purpose of Government-to-Government Consultation

The primary purpose of Government-to-Government consultation, as described in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*, is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. I am the FAA Official with the responsibility for coordinating Government-to-Government consultations with Tribes under FAA Order 1210.20 for this proposed project.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The City proposes to expand an existing 8,100 square foot (sf) concrete parking pad with a crushed rock border to 22,500 sf. The proposed project would include installation of solar lighting along the parking pad border and a stormwater runoff treatment and drainage system (drainage system).

An existing electrical vault northeast of the current parking pad will need to be relocated approximately 75 ft. east. Moving the vault would require the excavation of a twelve sf. hole that will be five foot (ft.) deep at the new location and a trench that is two ft. wide, three ft. deep, and 80 ft. long for the wiring.

The drainage system will be installed underneath the crushed rock border on the north and northeastern edge of the parking pad. The maximum depth of excavation required for the drainage system is five ft. deep. A four ft. by eight ft. bio-filtration modular system to collect and treat stormwater runoff, and a 15 ft. x 100 ft. storage vault, and a 150 ft. drain. The drain will be directional drilled from the parking pad buffer underneath Taxiway Charlie to an existing drainage swale. A three ft. by six ft. patch of crushed rock will be placed at the outlet for erosion control.

The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

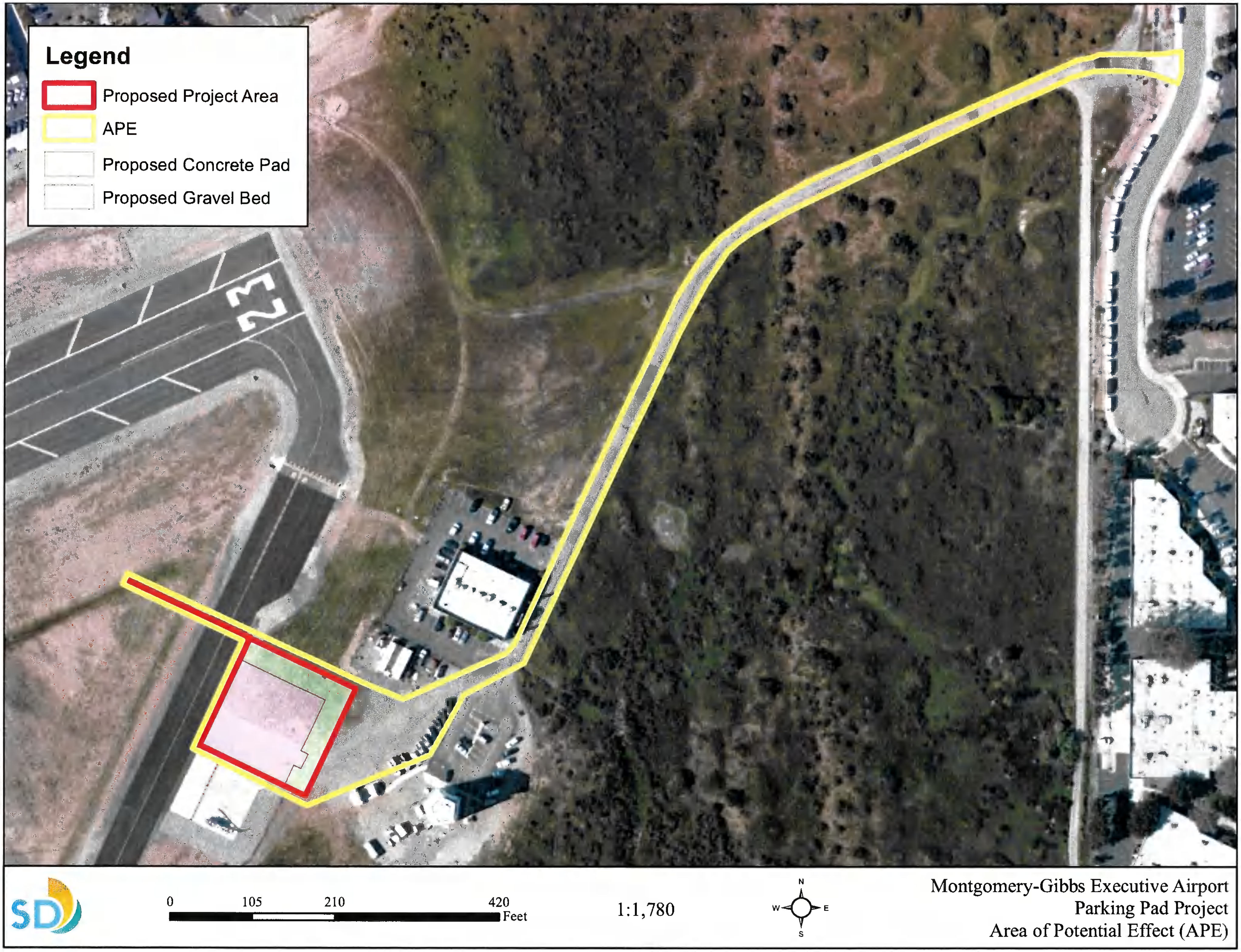
Your timely response within 30-days of receipt of this correspondence will greatly assist us in incorporating your concerns into project planning. If you wish to provide comments related to this proposed project, please contact Gail M. Campos, Environmental Protection Specialist, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov. Please feel free to contact me directly at 424-405-7299 or mark.mcclardy@faa.gov.

Sincerely,

Mark A. McClardy
Director, Office of Airports
Western-Pacific Region

1 Enclosure

cc:
John Flores, Environmental Coordinator, San Pasqual Band of Diegueno Mission Indians


Legend
Proposed Project Area
APE
Proposed Concrete Pad
Proposed Gravel Bed
23
0
105
210
420
Feet
1:1,780
N
W
E
S
Montgomery-Gibbs Executive Airport
Parking Pad Project
Area of Potential Effect (APE)

IPAI

SAN DIEGUENO MISSION INDIANS OF SAN PASQUAL BAND · CALIFORNIA

SAN PASQUAL BAND OF MISSION INDIANS

SAN PASQUAL RESERVATION

July 31, 2019

Federal Aviation Administration
Attn: Gail M. Campos, Environmental Protection Specialist
777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

Dear Ms. Campos,

RE: Proposed Parking Pad Expansions
Montgomery Field Airport
San Diego, California
Government-to-Government Consultation Initiation

After review of proposed project, we recognize the importance of aviation safety and the need for improvements. As the San Diego region grows, this kind of infrastructure is in much need.

As this project will require excavation, we become concerned for the possibility of disturbing the remaining cultural resources at the site. It would be reassuring to us if extreme care is taken at time of excavation. The Kumeyaay monitors will pay much attention as this phase of project moves forward.

Should you need additional information, please contact us at the Tribal Office, (760) 749-3200 ext. 5176.

Sincerely,

David L. Toler

David L. Toler
Councilman

P.O. BOX 365 • 16400 KUMEYAAY WAY, VALLEY CENTER, CA 92082
PHONE 760-749-3200 • FAX 760-749-3876 • WWW.SANPASQUALBANDOFMISSIONINDIANS.ORG

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Office of Airports
Los Angeles Airports District Office

777 S. Aviation Blvd., Suite 150
El Segundo, CA 90245

June 18, 2019

Clint Linton
Director of Cultural Resources
Kumeyaay Cultural Repatriation Committee
P.O. Box 507
Santa Ysabel, California 92070

Dear Mr. Linton:

Proposed Parking Pad Expansion
San Diego, San Diego County, California
Native American Consultation Initiation

The Federal Aviation Administration (FAA) and the City of San Diego (City) are preparing environmental documents evaluating the potential impacts resulting from the construction and operation of the proposed Parking Pad Expansion at Montgomery Field Airport. The City is the sponsor for Montgomery Field Airport. The FAA is the lead Federal Agency for Native American consultation for the proposed project. Tribal sovereignty, culture, traditional values, and customs will be respected at all times during the consultation process.

Consultation Initiation

With this letter, the FAA is seeking input on concerns that uniquely or significantly affect your Tribe related to proposed airport improvements. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources as project planning and alternatives are developed and refined. We are available to discuss the details of the proposed project with you.

Project Information

The City proposes to expand an existing 8,100 square foot (sf) concrete parking pad with a crushed rock border to 22,500 sf. The proposed project would include installation of solar lighting along the parking pad border and a stormwater runoff treatment and drainage system (drainage system).

An existing electrical vault northeast of the current parking pad will need to be relocated approximately 75 ft. east. Moving the vault would require the excavation of a twelve sf. hole that will be five foot (ft.) deep at the new location and a trench that is two ft. wide, three ft. deep, and 80 ft. long for the wiring.

The drainage system will be installed underneath the crushed rock border on the north and northeastern edge of the parking pad. The maximum depth of excavation required for the drainage system is five ft. deep. A four ft. by eight ft. bio-filtration modular system to collect and treat stormwater runoff, and a 15 ft. x 100 ft. storage vault, and a 150 ft. drain. The drain will be directional drilled from the parking pad buffer underneath Taxiway Charlie to an existing drainage swale. A three ft. by six ft. patch of crushed rock will be placed at the outlet for erosion control.

The staging area will be approximately 4,000 sf and placed on an existing paved and/or disturbed area. The enclosed figure shows the Area of Potential Effect for the proposed undertaking.

Confidentiality

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

FAA Contact Information

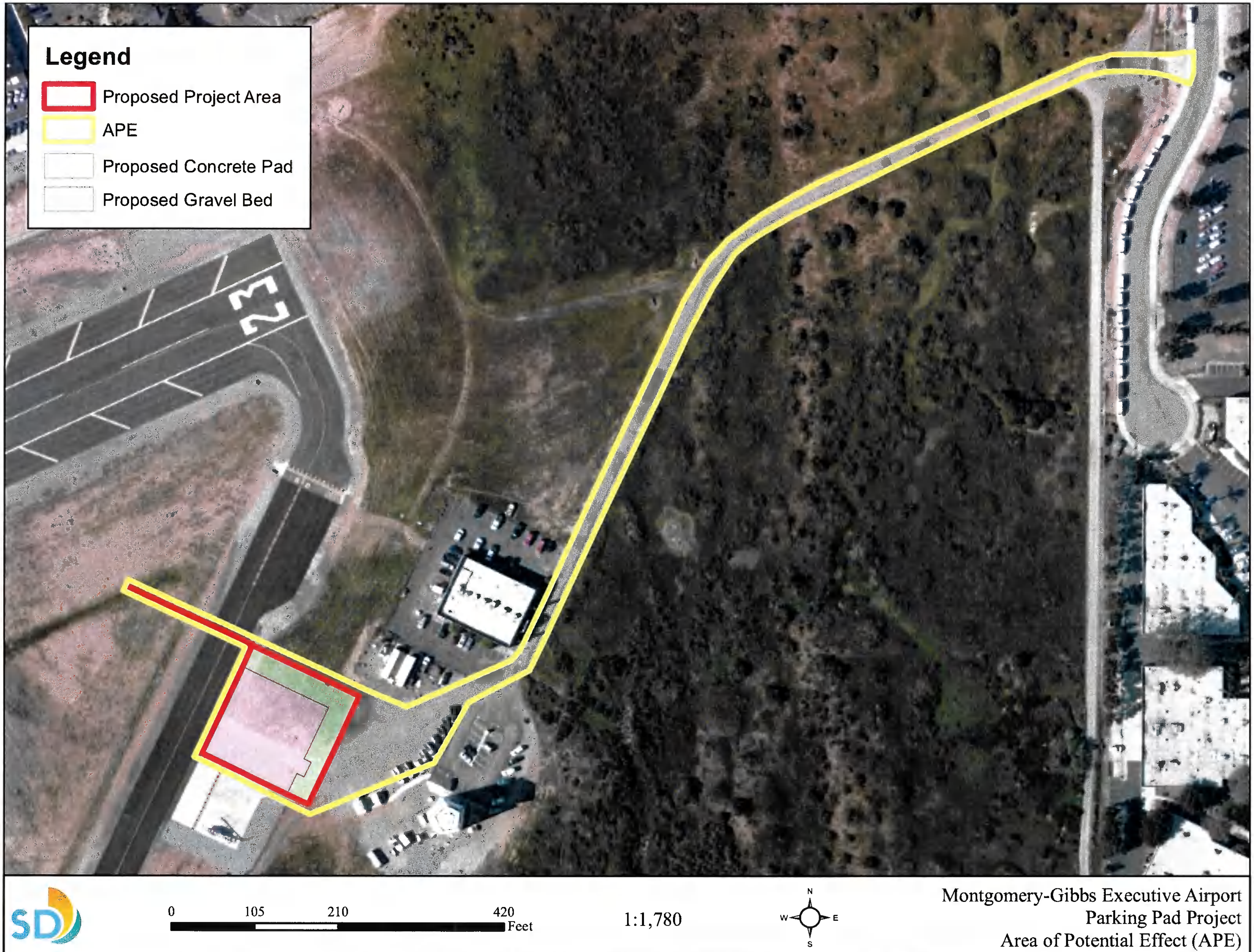
If you wish to provide comments related to this proposed project, please contact me, at the address above or by telephone at 424-405-7269 or by e-mail at gail.campos@faa.gov.

Sincerely,

Gail Campos

Gail Campos
Environmental Protection Specialist

1 Enclosure


Legend
Proposed Project Area
APE
Proposed Concrete Pad
Proposed Gravel Bed
23
0
105
210
420
Feet
1:1,780
N
W
E
S
Montgomery-Gibbs Executive Airport
Parking Pad Project
Area of Potential Effect (APE)

From:	Campos, Gail (FAA)
To:	Cindy Dunn (CDunn@sandiego.gov)
Subject:	MYF Parking Pad Tribal Response
Date:	Thursday, September 05, 2019 3:54:00 PM
Attachments:	MYF Parking Pad San Pasqual Tribal Gov Response 07312019.pdf MYF Parking Pad Viejas Tribal Gov Response.pdf Campo Band Response Fire Rescue Facility and Parking Pad Expansions.pdf MYF Viejas Response 11192018.pdf

Cindy,

Attached are the response to the Tribal coordination. In summary, all three request monitoring during ground disturbance and one tribe request that sacred sites be avoided. The requests are as follows:

- San Pasqual Band of Mission Indians – A Kumeyaay monitor
- Viejas Band of Kumeyaay Indians – A Kumeyaay Cultural monitor
- Campo Band of Mission Indians – request a monitor from Campo

Do you have records of the sacred sites? Or know what areas they want avoided? If not, I will contact the tribes that mentioned it to find out where these maybe and if we can get some sort of record for future development planning. We will need to coordinate with them when there is a construction start date.

Thank you

Gail Campos
Environmental Protection Specialist
Federal Aviation Administration
Los Angeles Airports District Office
777 Aviation Boulevard, Suite 150
El Segundo, CA 90245
424-405-7269
gail.campos@faa.gov

APPENDIX C

Resume for Principal Investigator

Carmen Zepeda-Herman, RPA

Senior Archaeologist

YEARS OF EXPERIENCE

22

EDUCATION

M.A. Anthropology, San Diego State University

B.A. Anthropology, University of California, Berkeley

Registered Professional Archaeologist, 15119

CERTIFICATIONS/PERMITS

Arizona State Museum, Antiquities Act Blanket Permit 2021-098bl

Arizona BLM Cultural Resource Use Permit AZ-000755

California BLM Cultural Resource Use Permit CA-22-28

California Department of Transportation, PQS Equivalent, Principal Investigator in Prehistoric Archaeology

City of San Diego Qualified Archaeological Principal Investigator

Orange County Certified Consultants List Archaeologist

County of Riverside Cultural Resources Consultants List

County of San Diego Approved CEQA Consultants List; Archaeology

AFFILIATIONS

Society for California Archaeology

San Diego County Archaeological Society

As RECON's Senior Archaeologist, Ms. Zepeda-Herman is responsible for leading and conducting field surveys, test excavations, data recovery excavations, and construction monitoring for cultural resource studies. She conducts background research, site records maintenance, and assembles crews for completion of projects with extensive experience in the southern California desert regions. Ms. Zepeda-Herman regularly works with a range of regulatory and assessment frameworks including National Historic Preservation Act, National Register of Historic Places, California Register of Historic Resources, and CEQA. She is certified by the Register of Professional Archaeologists (RPA) and meets the Secretary of the Interior's Professional Qualification Standards for Archaeology (36 CFR Part 61).

PROJECT EXPERIENCE

IDIQ Miscellaneous Environmental Services for Civil Works Projects, USACE Los Angeles District, DACW-09-02-D-0023

RECON conducted miscellaneous environmental services for the U.S. Army Corps of Engineers under a multi-year IDIQ for military and civil works projects throughout the South Pacific Division. As project archaeologist, Ms. Zepeda-Herman provided cultural resources technical services in support of several NEPA compliance documents. These included the East San Pedro Bay Ecosystem Restoration Feasibility Study and the EIS/EIR Support and Prado Basin Master Plan and EA.

County of San Diego Department of Public Works, As-Needed Environmental Services, San Diego, CA

Ms. Zepeda-Herman serves as cultural resources manager to the Department of Public Works under RECON's on-call contract. She completed a cultural resources survey and report for the Los Coches Sanitary Sewer Improvements and the Lakeside Large Diameter Sewer Improvements projects and provided support for a U.S. Army Corps of Engineers 404 permit for the Cole Grade Road Improvement project.

Beyer Park Development Project, San Diego, CA

As principal investigator, Ms. Zepeda-Herman surveyed the project area accompanied by a Native American monitor. Two previously recorded cultural resources (CA-SDI-10602 and CA-SDI-10614), two new prehistoric sites, and four new prehistoric isolated artifacts were located during the field survey. Testing is recommended if avoidance is not feasible.

Airway Road Industrial Development Project, San Diego, CA

Ms. Zepeda-Herman served as the principal investigator for this industrial distribution building construction project. Ms. Zepeda-Herman participated as an archaeological monitor and coordinated City-qualified archaeological and Native American monitors. The goal of monitoring was to prevent adverse effects to significant subsurface features, if any existed. No subsurface features were identified; however, over 100 lithic artifacts from the top 30 centimeters were recovered. The discovery of these artifacts resulted in the expansion on the boundary for CA-SDI-7208. Because this portion of CA-SDI-7208 was recommended not significant under CEQA, the project resulted in no significant impacts to cultural resources.

Spectrum Pedestrian Bridge Project, San Diego, CA

Ms. Zepeda-Herman served as the principal investigator for this project that would provide foot access between buildings of the Spectrum Research and Development campus. A series of foundations were identified during the archaeological survey. These were determined not significant cultural resources under the City of San Diego’s criteria.

Meadowood Specific Plan Project Additional Studies, San Diego, CA

Ms. Zepeda-Herman served as the principal investigator for the updated cultural resources survey for the Meadowood project, a proposed development of 389.5 acres. The project is subject to Section 106 of the National Historic Preservation Act. She authored the cultural resources survey report and attended Section 106 Tribal Consultation meetings with the U.S. Army Corps of Engineers to assist the client in obtaining a 404 permit. As part of this, she completed a Monitoring and Treatment Plan and assisted with writing the Memorandum of Agreement. Ms. Zepeda-Herman also served as the cultural project task lead during construction of the development and ensured that all compliance measures from the San Diego County and the U.S. Army Corps of Engineers were followed. This involved coordination with the grading contractor, applicant, and Tribal monitors.

Little Otay Truck Trail Test Excavation, San Diego, CA

Ms. Zepeda-Herman served as the principal investigator for a test excavation program in support of proposed U.S. Customs and Border Protection Maintenance and Repair of Patrol and Access Roads on Bureau of Land Management lands project. After completing a work plan and obtaining an ARPA permit, RECON excavated 24 shovel test pits and surface collected artifacts within the Area of Potential Effect. Excavation revealed that a portion of the APE had an intact cultural deposit, which was recommended eligible for the National Register of Historic Places. As such, Ms. Zepeda-Herman developed a capping plan to protect and avoid adverse effects to the cultural resource within the APE.

City of San Diego On-Call Cultural Resources, San Diego, CA

Ms. Zepeda-Herman was the project manager for this on-call contract to provide cultural resource services. Ms. Zepeda-Herman coordinated with Native American monitors, the City Mitigation Monitoring Coordinator, and contractors for various San Diego Gas & Electric undergrounding utility projects in order to implement the City of San Diego's mitigation monitoring program. Nine task orders have been issued to date under this contract. Archaeological monitoring has resulted in the discovery of several historic trash deposits from the early to mid-1900s. Coordination with the installation crews was important to ensure adequate documentation and artifact recovery while minimizing any delays imposed on the construction schedule.

Tijuana River Valley Regional Park Campground Construction Monitoring, San Diego, CA

Ms. Zepeda-Herman served as the Principal Investigator for the Tijuana River Valley Park Campground project. She coordinated with the client regarding the construction schedule. RECON provided archaeological monitoring during ground-disturbing activities and will complete a monitoring results report in compliance with County Parks and Recreation guidelines.

Barrett Dam Drainpipe Replacement Project, San Diego County, CA

Ms. Zepeda-Herman surveyed approximately 9 acres of the 45-acre survey area due to steep and densely vegetated slopes that made the area inaccessible. Three new and two previously recorded cultural resources were identified. Two of these resources were recommended eligible for listing on the National Register of Historic Places and the California Register of Historical Resources.

As-Needed Environmental Services, City of San Diego Public Utilities Department, San Diego, CA

Ms. Zepeda-Herman managed RECON's on-call environmental services contract with the City of San Diego Public Utilities Department. In this capacity, she was responsible for managing cultural and biological resource services, including emergency response, compliance monitoring, surveys, and technical reporting, in support of multiple capital improvement projects.

Sheriff Emergency Vehicle Operations Center, San Diego County, CA

Ms. Zepeda-Herman was the lead archaeologist for the cultural resources constraints study in support of the development of the County Sheriff's Emergency Vehicle Operation Center. She created a constraints map that avoided impacts to significant cultural resources to aid in the design of the operation center.

East Vista Way/Gopher Canyon Road and Stage Coach Lane/Reche Road Intersection Improvements Projects, San Diego County, CA

Ms. Zepeda-Herman served as the principal archaeologist and project manager for both of these projects which was to reduce traffic congestion and improve mobility through the addition of turn lanes. Ms. Zepeda-Herman coordinated with a Native American monitor and conducted a survey to identify any cultural resources. No design guidelines or mitigation were recommended in the survey report.

Prospect Estates II, Santee, CA

Ms. Zepeda-Herman surveyed the expanded portion of the project located in Santee and updated the survey report. One prehistoric site and two isolated artifacts were identified during the survey. Because of the degree of disturbance, the site was recommended not significant under CEQA guidelines.

Chapman Photovoltaic Solar Ranch Project, San Diego County, CA

Ms. Zepeda-Herman participated in the archaeological survey of approximately 135 acres. An area of approximately 40 acres is proposed for the construction of a solar generating facility and access roads. Ms. Zepeda-Herman assisted in recording 17 new cultural resources and 6 prehistoric isolated artifacts.

Bonita Road at Acacia Avenue Flood Control Improvements Project, Bonita, CA

Ms. Zepeda-Herman, accompanied by a Native American monitor, conducted a survey within the Chula Vista Municipal Golf Course and along Palm Drive. Prior to the survey, she completed a records search at the California Historical Resources Information Center, South Coastal Information Center to get a list of previously identified cultural resources. No resources were identified during the survey.

Coast Highway (Hill Street) Bridge Replacement Project, Oceanside, CA

Ms. Zepeda-Herman served as the principal investigator for this project. The City of Oceanside is proposing the replacement of the existing Coast Highway Bridge. Ms. Zepeda-Herman completed an archaeological survey of 43 acres and prepared the results per the Caltrans requirements for Archaeological Survey Reports. She will also prepare the Historic Properties Survey Report.

CONFIDENTIAL APPENDIX

Record Search (Not for Public Review)

APPENDIX C
Air Quality Analysis

This page intentionally left blank

Air Quality Analysis for Phase II of the San Diego Fire-Rescue Air Operations Hangar Project, Montgomery-Gibbs Executive Airport, San Diego, California

Prepared for
City of San Diego
Real Estate Assets
Airports Division
3750 John J. Montgomery Drive, MS 14
San Diego, CA 92123

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

RECON Number 9078
February 16, 2023

Jessica Fleming

Jessica Fleming,
Senior Environmental Specialist,
Noise, Air Quality, and GHG

TABLE OF CONTENTS

FIGURES

TABLE OF CONTENTS (cont.)

TABLES

ATTACHMENTS

Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
°F	degrees Fahrenheit
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
AEDT	Aviation Environmental Design Tool
AirOps	air operations
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of San Diego
CO	carbon monoxide
CUP	Conditional Use Permit
DPM	diesel particulate matter
FAA	Federal Aviation Administration
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PM_{10}	particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 microns or less
ppb	parts per billion
ppm	parts per million
project	San Diego Fire-Rescue Air Operations Hangar Project
RAQS	Regional Air Quality Strategy
ROG	reactive organic gas
SANDAG	San Diego Association of Governments
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDFR	San Diego Fire-Rescue
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	oxides of sulfur
TACs	toxic air contaminants
TCM	Transportation Control Measures
U.S. EPA	United States Environmental Protection Agency
USC	United States Code
VOC	volatile organic compounds

Executive Summary

This report evaluates potential local and regional air quality impacts associated with the proposed San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (project) located in the northeastern corner of the Montgomery-Gibbs Executive Airport in the city of San Diego. The project area consists of a 6.5-acre site located adjacent to the Air Traffic Control Tower between the Federal Aviation Administration (FAA) lease area, the Runway Object Free Area, and the Runway Protection Zone for the northwest approach to Runway 5/23. The project would design and construct permanent helicopter hangars and support facilities.

The General Conformity Rule applies to any federal action and requires analysis of emissions of criteria pollutants and their precursors for which an area is designated nonattainment or that is covered by a maintenance plan (FAA 2015). If an action is not exempt or presumed to conform, or is found to cause emissions above applicable *de minimis* levels in any non-attainment or maintenance area, the agency must prepare a General Conformity Determination prior to taking the action. The project site is located within the San Diego Air Basin, which is a federal severe non-attainment area for 8-hour ozone (O_3), as well as a maintenance/attainment area for carbon monoxide (CO). Therefore, the General Conformity Rule is applicable to the project emissions of CO and ozone precursors (volatile organic compounds [VOC] and oxides of nitrogen [NO_X]).

Emissions due to construction and operation of the project were calculated and compared to the General Conformity *de minimis* levels. As calculated in this analysis, total annual construction emissions and total annual operational emissions would be well less than the applicable General Conformity *de minimis* levels. Therefore, air quality impacts due to the project would not result in adverse air quality impacts and a General Conformity determination is neither applicable nor required.

1.0 Introduction

The purpose of this report is to assess potential short-term and long-term local and regional air quality impacts resulting from development of the proposed San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (project).

Air pollution affects all southern Californians. Effects can include increased respiratory infections, increased discomfort, missed days from work and school, and increased mortality. Polluted air also damages agriculture and our natural environment.

The state of California is divided geographically into 15 air basins for managing the air resources of the state on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. The project site is located within the San Diego Air Basin (SDAB). The SDAB is currently classified as a federal non-attainment area for ozone, and a state non-attainment area for particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and ozone.

Air quality impacts can result from the construction and operation of the project. Construction impacts are short term and result from fugitive dust, equipment exhaust, and indirect effects associated with construction workers and deliveries. Operational impacts can occur on two levels: regional impacts resulting from growth-inducing development, or local hot-spot effects stemming from sensitive receivers being placed close to highly congested roadways. In the case of this project, operational impacts would be primarily due to emissions to the basin from mobile sources associated with vehicular travel along the roadways within the project area.

The analysis of impacts is based on federal and state Ambient Air Quality Standards (AAQS) and is assessed in accordance with the guidelines, policies, and standards established by the City of San Diego (City) and the San Diego Air Pollution Control District (SDAPCD). Project compatibility with the adopted air quality plan for the area is also assessed. Measures are recommended, as required, to reduce potentially significant impacts.

2.0 Project Description

Phase II of the San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (project) would construct permanent helicopter hangars and support facilities at Montgomery-Gibbs Executive Airport. The project would support Phase I of the AirOps Facility Project that was completed in November 2019. Phase I consisted of interior remodeling and tenant improvements of the existing AirOps building. AirOps is a 24 hours a day, 365 days a year operating facility with no current hangar space at Montgomery-Gibbs Executive Airport to support these operations. A feasibility study concluded that 30,000 square feet of hangar space are required to meet future needs of the AirOps fleet. Phase II would add helicopter hangars and support facilities to make the AirOps building improved under Phase I a fully operational fleet center for SDFR's helicopters and rapid fire response. The proposed construction would occur in the northeastern corner of the Montgomery-Gibbs Executive Airport in the city of San Diego, California. The area of temporary and permanent disturbance would consist of a 3.72-acre site east of Taxiway Charlie and the Taxiway Safety Area, located adjacent to the Air Traffic Control Tower between the Federal Aviation Administration (FAA) lease area, the Runway Object Free Area, and the Runway Protection Zone for the northwest approach to Runway 5/23. Project construction would be limited to the 3.72-acre project footprint to avoid impacts to additional natural areas and avoid interference with runway operations. Consequently, the Proposed Action would not have a pre-defined temporary staging area, but would utilize various staging areas during the phased construction process in order to limit construction activities to the 3.72-acre project footprint. Entry to the project area would be provided via an asphalt road accessed from a security gate located off Ponderosa Avenue. Regional and Airport Boundary maps are provided in Figures 1 and 2, respectively. Figure 3 shows the project footprint.

RECON

M:\JOBS5\9078\common_gis\fig1_nos.mxd 2/16/2023 fmm

FIGURE 1

Regional Location

Image Source: Nearmap (flown January 2022)

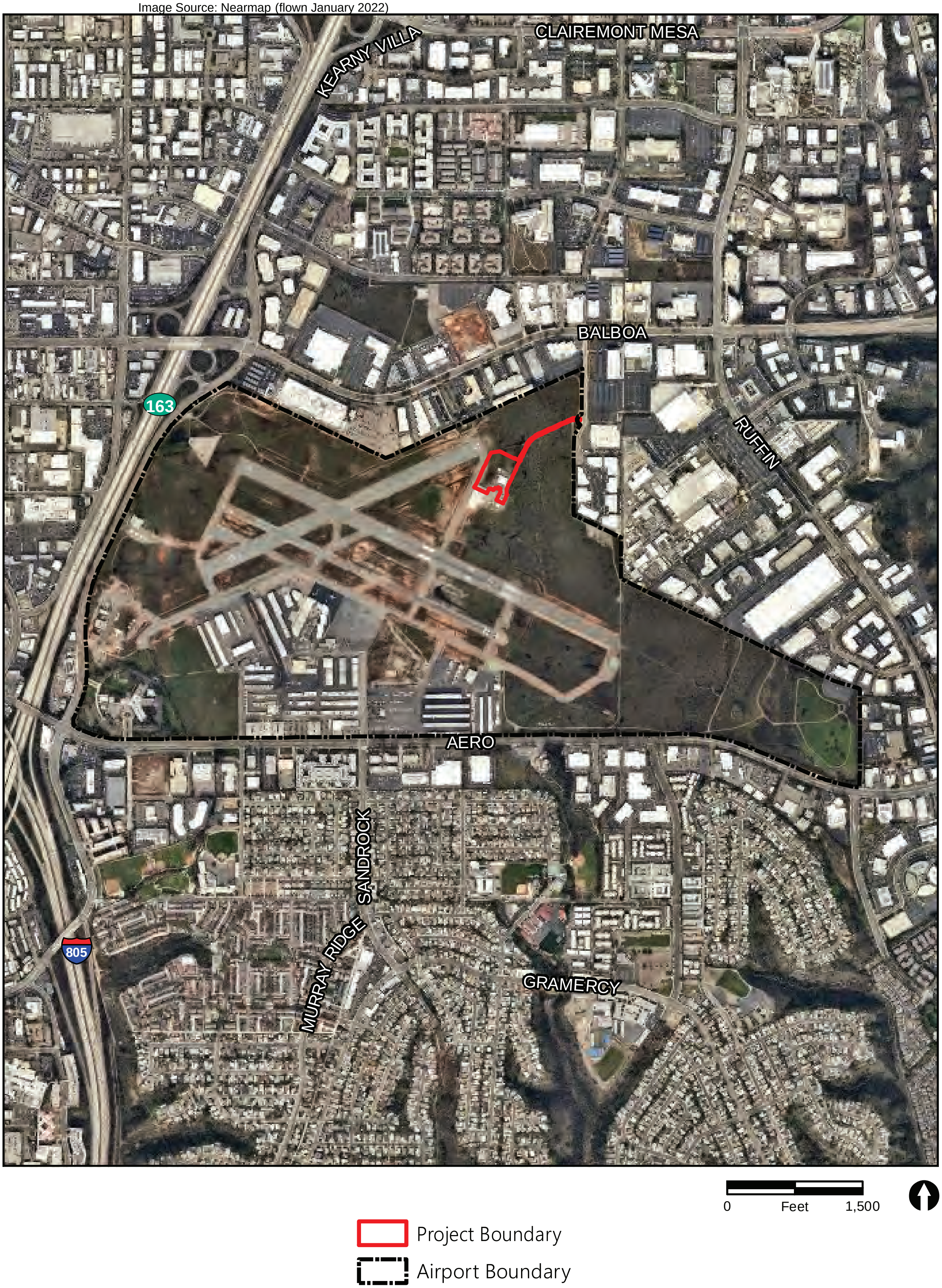


FIGURE 2
Airport Boundary

RECON

M:\JOBS5\9078\common_gis\fig2_nos.mxd 2/16/2023 fmm

Image Source: Nearmap (flown January 2023)

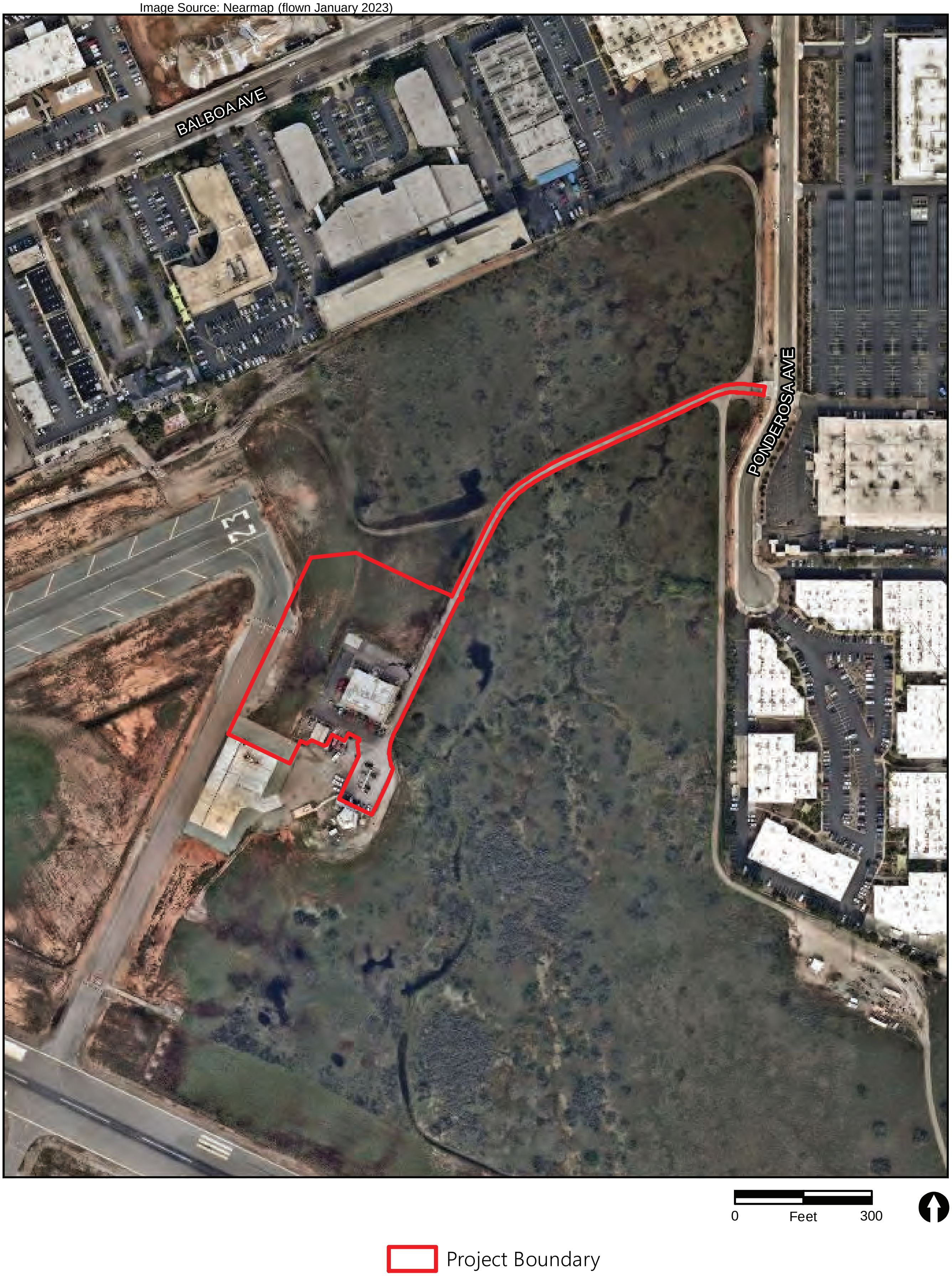


FIGURE 3
Project Location on Aerial Photograph

RECON

M:\JOBS5\9078\common_gis\fig3_nos.mxd 2/16/2023 fmm

The project would include the following components:

- Construct approximately 32,000 square feet of prefabricated metal hangar that would contain a hangar support area for maintenance offices, over-haul, avionics, and storage rooms.
- Construct an approximately 65,000-square-foot concrete apron, to accommodate five helicopters.
- Construct parking and shelter for a single Heli-tender and two fueling tender vehicles.
- Relocate existing utility connections (sewer, stormwater, gas, water, power, etc.) within the main access roadway from Ponderosa Avenue. Relocations would consist of trenching within the existing main access roadway and repaved. All relocation activities would be confined to the existing main access roadway and would not affect natural soils surrounding the main access roadway.
- Repair and resurface the main access road from Ponderosa Avenue to the FAA Air Traffic Control Tower and new AirOps facility.
- Install storm water retention features that would capture runoff from the proposed improvements and an existing parking pad adjacent to the southern project boundary. The project would route all runoff from new impervious areas into a proposed permanent modular wetland for water quality and then into a proposed underground storage system for detention of the 100-year peak volumes. The modular wetland and underground storage system would be constructed as a part of the project. Captured peak runoff volumes from the six-hour, 100-year storm event would be pumped and hauled off for discharge into an acceptable Municipal Separate Storm Sewer System that meets the requirements of the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266.

SDFR currently operates three helicopters: two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk. The proposed hangars are intended to accommodate these three existing helicopters, as well as one additional Lockheed Martin/SikorskyS70i Firehawk and one additional Bell 412. The project is anticipated to be awarded as a design/build contract, with a 12-month design phase and a 14-month construction phase. Additionally, mitigation for project impacts on vernal pools is anticipated to begin at the City of San Diego's (City's) vernal pool mitigation bank in calendar year 2022 and be completed in calendar year 2023.

In the future condition, the Bell 412 helicopters would take off and land from the existing concrete parking pad, while the Lockheed Martin/SikorskyS70i Firehawks would taxi from the proposed hangars along Taxiway Charlie to take off from Runway 5/23. The Lockheed Martin/SikorskyS70i Firehawks would also land at Runway 5/23 and taxi back to the proposed hangars along Taxiway Charlie.

3.0 Regulatory Framework

3.1 Federal Regulations

3.1.1 Ambient Air Quality Standards

AAQS represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 [42 United States Code (USC) 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, in order to achieve the purposes of Section 109 of the CAA [42 USC 7409], the U.S. Environmental Protection Agency (U.S. EPA) developed primary and secondary National Ambient Air Quality Standards (NAAQS).

Six criteria pollutants of primary concern have been designated: ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb), and respirable particulate matter (PM_{10} and $PM_{2.5}$). The primary NAAQS ". . . in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health . . . " and the secondary standards ". . . protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 USC 7409(b)(2)]. The primary NAAQS were established, with a margin of safety, considering long-term exposure for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties). The NAAQS are presented in Table 1 (California Air Resources Board [CARB] 2016).

An air basin is designated as either attainment or non-attainment for a particular pollutant. Once a non-attainment area has achieved the AAQS for a particular pollutant, it is re-designated as an attainment area for that pollutant. To be redesignated, the area must meet air quality standards for three consecutive years. After re-designation to attainment, the area is known as a maintenance area and must develop a 10-year plan for continuing to meet and maintain air quality standards, as well as satisfy other requirements of the federal CAA. The SDAB is a severe non-attainment area for the federal ozone standard.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone[8]	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 $\mu g/m^3$)		0.070 ppm (137 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})[9]	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		–		
Fine Particulate Matter ($PM_{2.5}$)[9]	24 Hour	No Separate State Standard		35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	12 $\mu g/m^3$	15 $\mu g/m^3$	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-dispersive Infrared Photometry	35 ppm (40 mg/m^3)	–	Non-dispersive Infrared Photometry
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	–	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemi-luminescence	100 ppb (188 $\mu g/m^3$)	–	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^3$)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3 Hour	–		–	0.5 ppm (1,300 $\mu g/m^3$)	
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (for certain areas)[11]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[11]	–	
Lead[12,13]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 $\mu g/m^3$ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 $\mu g/m^3$		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chroma-tography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chroma-tography			

See footnotes on next page.

Table 1 Ambient Air Quality Standards
ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; – = not applicable. [1] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. [2] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies. [3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. [4] Any equivalent measurement method which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used. [5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. [6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. [7] Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA. [8] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. [9] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standards of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years. [10] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of ppb. California standards are in units of ppm. To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm. [11] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated non-attainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm. [12] The Air Resources Board has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants. [13] The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. [14] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively. SOURCE: CARB 2016.

3.1.2 General Conformity Rule

The General Conformity Rule requires that federal agencies demonstrate that actions would conform to the applicable State Implementation Plan (SIP), by either determining that the action is exempt from the General Conformity Rule requirements or subject to a formal conformity determination. This requires analysis of the total direct and indirect emissions of criteria pollutants and their precursors for which an area is designated non-attainment or covered by a maintenance plan. The total direct and indirect emissions are the net emission increases in the non-attainment or maintenance area caused by the action. The emissions must be reasonably foreseeable at the time the conformity determination is made. For indirect emissions, the federal agency also must be able to practicably control the emissions based upon the agency's continuing program responsibility. If the findings from the applicability analysis show that emissions resulting from an action would not exceed applicable General Conformity *de minimis* levels, then the action would conform to the applicable SIP and no further analysis would be required. If emissions resulting from an action would exceed applicable General Conformity *de minimis* levels, then a formal Air Quality Conformity Analysis and General Conformity Determination would be required.

3.1.3 Federal Aviation Administration

The FAA provides guidance for assessing air quality impacts and determining conformity under the General Conformity regulations in the *Aviation Emissions and Air Quality Handbook Version 3 Update 1*. According to the *Aviation Emissions and Air Quality Handbook*, there is a multi-stage process to determining the need for an air quality study, which includes four steps: (1) determine the need for the assessment; (2) select the assessment methodology; (3) conduct the assessment; and (4) coordinate/review and document the results. The *Aviation Emissions and Air Quality Handbook* also defines what criteria the FAA use to assess in Chapter 8, Conformity, which states "[t]he General Conformity process begins with an "applicability analysis" whereby the federal agency (or agencies) with jurisdiction over the action determines how and to what degree General Conformity applies." This process has "three elements – (i) Applicability Analysis, (ii) Preparing a General Conformity Determination, and (iii) Interagency and Public Review Process…" (FAA 2015). The FAA's guidance for General Conformity analysis is discussed in detail in Section 3.0, Thresholds for Determining Air Quality Impacts.

3.2 State Regulations

3.2.1 Criteria Pollutants

The CARB has developed the California Ambient Air Quality Standards (CAAQS) and generally has set more stringent limits on the criteria pollutants than the NAAQS (see Table 1). In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride (see Table 1).

Similar to the federal CAA, the state classifies as either "attainment" or "non-attainment" areas for each pollutant based on the comparison of measured data with the CAAQS. The SDAB is a non-attainment area for the state ozone standards, the state PM_{10} standard, and the state $PM_{2.5}$ standard.

3.2.2 Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant public health issue in California. Diesel-exhaust particulate matter emissions have been established as TACs. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air.

The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

The Children's Environmental Health Protection Act, California Senate Bill 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air monitoring network, and develop any additional air toxic control measures needed to protect children's health. Locally, toxic air pollutants are regulated through the SDAPCD's Regulation XII. Of particular concern statewide are diesel-exhaust particulate matter emissions. Diesel-exhaust particulate matter was established as a TAC in 1998, and is estimated to represent a majority of the cancer risk from TACs statewide (based on the statewide average). Diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants program.

Following the identification of diesel particulate matter (DPM) as a TAC in 1998, CARB has worked on developing strategies and regulations aimed at reducing the risk from DPM. The overall strategy for achieving these reductions is found in the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB 2000a). A stated goal of the plan is to reduce the statewide cancer risk arising from exposure to DPM by 85 percent by 2020.

In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB Handbook, CARB 2005). The CARB Handbook makes recommendations directed at protecting sensitive land uses from air pollutant emissions while balancing a myriad of other land use issues (e.g., housing, transportation needs, economics, etc.). It notes that the CARB Handbook is not regulatory or binding on local agencies and recognizes that application takes a qualitative approach. As reflected in the CARB Handbook, there is currently no adopted standard for the significance of health effects from mobile sources. Therefore, the CARB has provided guidelines for the siting of land uses near heavily traveled roadways. Of pertinence to this study, the CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible.

As an ongoing process, CARB will continue to establish new programs and regulations for the control of diesel particulate and other air-toxics emissions as appropriate. The continued development and implementation of these programs and policies will ensure that the public's exposure to DPM will continue to decline.

3.2.3 State Implementation Plan

The SIP is a collection of documents that set forth the state's strategies for achieving the NAAQS. In California, the SIP is a compilation of new and previously submitted plans, programs (such as air quality management plans, monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. The CARB is the lead agency for all purposes related to the SIP under state law. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. The CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

The SDAPCD is responsible for preparing and implementing the portion of the SIP applicable to the SDAB. The SIP plans for San Diego County specifically include the Redesignation Request and Maintenance Plan for the 1997 National Ozone Standard for San Diego County (2012), and the 2004 Revision to the California State Implementation Plan for Carbon Monoxide – Updated Maintenance Plan for Ten Federal Planning Areas.

3.2.4 The California Environmental Quality Act

Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines requires discussion of any inconsistencies between the project and applicable general plans and regional plans, including the applicable air quality attainment or maintenance plan (or SIP).

3.3 San Diego Air Pollution Control District

The SDAPCD is the agency that regulates air quality in the SDAB. The SDAPCD prepared the Regional Air Quality Strategy (RAQS) in response to the requirements set forth in the California CAA AB 2595 (SDAPCD 1992) and the federal CAA. Motor vehicles are San Diego County's leading source of air pollution. In addition to these sources, other mobile sources include construction equipment, trains, and airplanes. Reducing mobile source emissions requires the technological improvement of existing mobile sources and the examination of future mobile sources, such as those associated with new or modification projects (e.g., retrofitting older vehicles with cleaner emission technologies). In addition to mobile sources, stationary sources also contribute to air pollution in the SDAB. Stationary sources include gasoline stations, power plants, dry cleaners, and other commercial and industrial uses. Stationary sources of air pollution are regulated by the local air pollution control or management district, in this case the SDAPCD.

The SDAPCD is responsible for preparing and implementing the RAQS. As part of the RAQS, the SDAPCD developed Transportation Control Measures (TCMs) for the air quality plan prepared by the San Diego Association of Governments (SANDAG) in accordance with AB 2595 and adopted by SANDAG on March 27, 1992, as Resolution Number 92-49 and Addendum. The RAQS and TCM set forth the steps needed to accomplish attainment of NAAQS and CAAQS. The required periodic updates of the RAQS and corresponding TCM were adopted in 1995, 1998, 2001, 2004, 2009, and 2016, and the draft 2022 RAQS will be considered for adoption in March 2023.

The SDAPCD has also established a set of rules and regulations initially adopted on January 1, 1969 and periodically reviewed and updated. These rules and regulations are available for review on the agency's website.

4.0 Environmental Setting

4.1 Geographic Setting

The project is located at Montgomery-Gibbs Executive Airport in the city of San Diego, about seven miles east of the Pacific Ocean. The eastern portion of the SDAB is surrounded by mountains to the north, east, and south. These mountains tend to restrict airflow and concentrate pollutants in the valleys and low-lying areas below.

4.2 Climate

The project area, like the rest of San Diego County, has a Mediterranean climate characterized by warm, dry summers and mild winters. The average annual precipitation is 10 inches, falling primarily from November to April. The mean annual temperature for the project area is 63 degrees Fahrenheit (°F). Winter low temperatures in the project area average about 49°F, and summer high temperatures average about 74°F. The average relative humidity is 69 percent and is based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center 2019).

The dominant meteorological feature affecting the region is the Pacific High Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas. Consequently, air quality near the coast is generally better than that which occurs at the base of the coastal mountain range.

Fluctuations in the strength and pattern of winds from the Pacific High Pressure Zone interacting with the daily local cycle produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the SDAB. Beneath the inversion layer pollutants become "trapped" as their ability to disperse diminishes. The mixing depth is the area under the inversion layer. Generally, the morning inversion layer is lower than the afternoon inversion layer. The greater the change between the morning and afternoon mixing depths, the greater the ability of the atmosphere to disperse pollutants.

Throughout the year, the height of the temperature inversion in the afternoon varies between approximately 1,500 and 2,500 feet above mean sea level. In winter, the morning inversion layer is about 800 feet above mean sea level. In summer, the morning inversion layer is about 1,100 feet above mean sea level. Therefore, air quality generally tends to be better in the winter than in the summer.

The prevailing westerly wind pattern is sometimes interrupted by regional “Santa Ana” conditions. A Santa Ana occurs when a strong high pressure develops over the Nevada-Utah area and overcomes the prevailing westerly coastal winds, sending strong, steady, hot, dry northeasterly winds over the mountains and out to sea.

Strong Santa Anas tend to blow pollutants out over the ocean, producing clear days. However, at the onset or during breakdown of these conditions, or if the Santa Ana is weak, local air quality may be adversely affected. In these cases, emissions from the South Coast Air Basin to the north are blown out over the ocean, and low pressure over Baja California, Mexico draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterly winds reassert themselves and send this cloud of contamination ashore in the SDAB. When this event does occur, the combination of transported and locally produced contaminants produce the worst air quality measurements recorded in the basin.

4.3 Existing Air Quality

Air quality at a particular location is a function of the kinds, amounts, and dispersal rates of pollutants being emitted into the air locally and throughout the basin. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards set by the CARB or federal standards set by the U.S. EPA. The SDAPCD maintains 10 air quality monitoring stations located throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used by scientists to help forecast daily air pollution levels.

The San Diego–Kearny Villa monitoring station located at 6125A Kearny Villa Road, approximately two miles north of the project site, is the nearest station to the project site. The Kearney Villa monitoring station measures ozone, NO_2, PM_{10}, and $PM_{2.5}$. Table 2 provides a summary of measurements collected at the Kearny Villa monitoring station for the years 2017 through 2021.

Table 2 Summary of Air Quality Measurements Recorded at the San Diego – Kearny Villa Air Quality Monitoring Station					
Pollutant/Standard	2017	2018	2019	2020	2021
Ozone					
Max. 1-hr (ppm)	0.097	0.102	0.083	0.123	0.095
Days State 1-hour Standard Exceeded (0.09 ppm)	2	1	0	2	1
Federal Max 8-hr (ppm)	0.083	0.077	0.075	0.102	0.071
Days 2008 Federal 8-hour Standard Exceeded (0.075 ppm)	4	1	0	6	0
Days 2015 Federal 8-hour Standard Exceeded (0.070 ppm)	6	5	1	10	1
State Max 8-hr (ppm)	0.084	0.077	0.076	0.102	0.072
Days State 8-hour Standard Exceeded (0.07 ppm)	6	5	1	12	2
Nitrogen Dioxide					
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Days Federal 1-hour Standard Exceeded (0.100 ppm)	0	0	0	0	0
Max 1-hr (ppm)	0.054	0.045	0.046	0.052	0.060
Annual Average (ppm)	0.009	0.008	0.008	0.007	0.007
PM_{10}*					
State Max. Daily (μg/m^3)	47.0	38.0	--	--	--
Measured Days State 24-hour Standard Exceeded (50 μg/m^3)	0	0	0	0	--
Calculated Days State 24-hour Standard Exceeded (50 μg/m^3)	0.0	0.0	--	--	--
State Annual Average (μg/m^3)	17.6	18.4	--	--	--
Federal Max. Daily (μg/m^3)	46.0	38.0	--	--	--
Measured Days Federal 24-hour Standard Exceeded (150 μg/m^3)	0	0	0	0	--
Calculated Days Federal 24-hour Standard Exceeded (150 μg/m^3)	0.0	0.0	--	--	--
Federal Annual Average (μg/m^3)	17.6	18.4	--	--	--
$PM_{2.5}$*					
State Max. Daily (μg/m^3)	27.5	32.2	15.0	--	--
State Annual Average (μg/m^3)	8.0	8.3	--	--	--
Federal Max. Daily (μg/m^3)	27.5	32.2	16.2	47.5	20.9
Measured Days Federal 24-hour Standard Exceeded (35 μg/m^3)	0	0	0	2	0
Calculated Days Federal 24-hour Standard Exceeded (35 μg/m^3)	0.0	0.0	0.0	5.8	0.0
Federal Annual Average (μg/m^3)	7.9	8.3	7.0	8.7	7.6

SOURCE: CARB 2023.
ppm = parts per million; μg/m^3 = micrograms per cubic meter; -- = Not available.
* Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

4.3.1 Ozone

Nitrogen oxides and hydrocarbons (reactive organic gases [ROG], or volatile organic compounds [VOC]) are known as the chief "precursors" of ozone. These compounds react in the presence of sunlight to produce ozone, which is the primary air pollution problem in the SDAB. Because sunlight plays such an important role in its formation, ozone pollution—or smog—is mainly a concern during the daytime in summer months. The SDAB is currently designated a federal and state non-attainment area for ozone.

About half of smog-forming emissions come from automobiles. Population growth in San Diego has resulted in a large increase in the number of automobiles expelling ozone-forming pollutants while operating on area roadways. In addition, the occasional transport of smog-filled air from the South Coast Air Basin only adds to the SDAB's ozone problem. Stricter automobile emission controls, including more efficient automobile engines, have played a large role in why ozone levels have steadily decreased.

In order to address adverse health effects due to prolonged exposure, the U.S. EPA phased out the national 1-hour ozone standard and replaced it with the more protective 8-hour ozone standard. The SDAB is currently a non-attainment area for the previous (1997) national 8-hour standard, and is recommended as a non-attainment area for the revised (2008) national 8-hour standard of 0.075 parts per million (ppm).

Not all of the ozone within the SDAB is derived from local sources. Under certain meteorological conditions, such as during Santa Ana wind events, ozone and other pollutants are transported from the Los Angeles Basin and combine with ozone formed from local emission sources to produce elevated ozone levels in the SDAB.

Local agencies can control neither the source nor the transportation of pollutants from outside the air basin. The SDAPCD's policy, therefore, has been to control local sources effectively enough to reduce locally produced contamination to clean air standards. Through the use of air pollution control measures outlined in the RAQS, the SDAPCD has effectively reduced ozone levels in the SDAB.

Actions that have been taken in the SDAB to reduce ozone concentrations include:

- **TCMs if vehicle travel and emissions exceed attainment demonstration levels.** TCMs are strategies that will reduce transportation-related emissions by reducing vehicle use or improving traffic flow.

- **Enhanced motor vehicle inspection and maintenance program.** The smog check program is overseen by the Bureau of Automotive Repair. The program requires most vehicles to pass a smog test once every two years before registering in the state of California. The smog check program monitors the amount of pollutants automobiles produce. One focus of the program is identifying "gross polluters," or vehicles that exceed two times the allowable emissions for a particular model. Regular maintenance and tune-ups, changing the oil, and checking tire inflation can improve gas mileage and lower air pollutant emissions. It can also reduce traffic congestion due to preventable breakdowns, further lowering emissions.

- **Air Quality Improvement Program.** This program, established by AB 118, is a voluntary incentive program administered by the CARB to fund clean vehicle and equipment projects, research on biofuels production and the air quality impacts of alternative fuels, and workforce training.

4.3.2 Carbon Monoxide

The SDAB is classified as a state attainment area and as a federal maintenance area for CO. Until 2003, no violations of the state standard for CO had been recorded in the SDAB since 1991, and no violations of the national standard had been recorded in the SDAB since 1989. The violations that took place in 2003 were likely the result of massive wildfires that occurred throughout the county. No violations of the state or federal CO standards have occurred since 2003.

Small-scale, localized concentrations of CO above the state and national standards have the potential to occur at intersections with stagnation points such as those that occur on major highways and heavily traveled and congested roadways. Localized high concentrations of CO are referred to as "CO hot spots" and are a concern at congested intersections, where automobile engines burn fuel less efficiently and their exhaust contains more CO.

4.3.3 Particulate Matter

Particulate matter is a complex mixture of microscopic solid or liquid particles including chemicals, soot, and dust. Anthropogenic sources of direct particulate emissions include crushing or grinding operations, dust stirred up by vehicle traffic, and combustion sources such as motor vehicles, power plants, wood burning, forest fires, agricultural burning and industrial processes. Additionally, indirect emissions may be formed when aerosols react with compounds found in the atmosphere.

Health studies have shown a significant association between exposure to particulate matter and premature death in people with heart or lung diseases. Other important effects include aggravation of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heartbeat (U.S. EPA 2016).

As its properties vary based on the size of suspended particles, particulate matter is generally categorized as PM_{10} or $PM_{2.5}$.

4.3.3.1 PM_{10}

PM_{10}, occasionally referred to as "inhalable coarse particles" has an aerodynamic diameter of about one-seventh of the diameter of a human hair. High concentrations of PM_{10} are often found near roadways, construction, mining, or agricultural operations.

4.3.3.2 $PM_{2.5}$

$PM_{2.5}$, occasionally referred to as "inhalable fine particles" has an aerodynamic diameter of about one-thirtieth of the diameter of a human hair. $PM_{2.5}$ is the main cause of haze in many parts of the U.S. Federal standards applicable to $PM_{2.5}$ were first adopted in 1997.

4.3.4 Other Criteria Pollutants

The national and state standards for NO_2, oxides of sulfur (SO_X), and the previous standard for lead are being met in the SDAB, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future. As discussed above, new standards for these pollutants have been adopted, and new designations for the SDAB will be determined in the future. The SDAB is also in attainment of the state standards for vinyl chloride, hydrogen sulfides, sulfates, and visibility-reducing particulates.

5.0 Thresholds of Significance

5.1 Federal General Conformity Rule

The General Conformity Rule applies to any federal action and requires analysis of emissions of criteria pollutants and their precursors for which an area is designated nonattainment or that is covered by a maintenance plan (FAA 2015). The General Conformity applicability analysis outlined in the *Aviation Emissions and Air Quality Handbook* provides a range of factors to consider in determining whether the rule applies to the project/action. These factors include the following:

1. Will the action occur in a nonattainment or maintenance area(s);
2. Does a specific exemption allowed in the General Conformity Rule apply to the action;
3. Is the action, or portions of the project, included on the federal agency's list of "presumed to conform activities";
4. Do the total direct and indirect air emissions associated with the action exceed the General Conformity *de minimis* levels; and
5. Does the EPA-approved SIP have an emissions budget against which the emissions associated with the action could be compared and is the budget inclusive of the action?

If an action is not exempt or presumed to conform, or found to cause emissions above applicable *de minimis* levels in any nonattainment or maintenance area, the agency must prepare a General Conformity Determination prior to taking the action (FAA 2015).

The project site is located within the SDAB, which is a federal severe non-attainment area for 8-hour ozone, as well as a maintenance/attainment area for CO. Therefore, the General Conformity Rule is applicable to the project emissions of CO and ozone precursors (VOC and oxides of nitrogen [NO_X]). The General Conformity *de minimis* levels applicable to the SDAB are shown in Table 3.

Table 3
General Conformity De Minimis Limits

Pollutant	Designation Category	Emissions (Tons/Year)
Ozone Precursors (VOC or NO_X)	Non-attainment (Severe)	25
Carbon Monoxide (CO)	Attainment (Maintenance)	100

Sources: 40 CFR 93.53(b)(1) and 40 CFR 93.53(b)(2)
VOC = volatile organic compounds
Note: The U.S. EPA uses the term VOC and CARB's Emission Inventory Branch (EIB) uses the term ROG. ROG is similar, but not identical to VOC, which is based on U.S. EPA's exempt VOC list. There are minor deviations between compounds that define each term; however, the emissions of VOC and ROG are essentially the same for the emission sources considered in this analysis (CARB 2000b, 2004).

5.2 City of San Diego

The SDAPCD specifies Air Quality Impact Analysis trigger levels for new or modified stationary sources (SDAPCD Rules 20.1, 20.2, and 20.3). The SDAPCD does not consider these trigger levels to represent adverse air quality impacts, rather, if these trigger levels are exceeded by a project, the SDAPCD requires an air quality analysis to determine if a significant air quality impact would occur. While, these trigger levels do not generally apply to mobile sources or general land development projects, for comparative purposes these levels are used to evaluate the increased emissions that would be discharged to the SDAB if the project were approved.

The SDAPCD trigger levels are also utilized by the City in their Significance Determination Thresholds (City of San Diego 2016) as one of the considerations when determining the potential significance of air quality impacts for projects within the city. The air quality impact screening levels used in this analysis are shown in Table 4.

Table 4
Air Quality Impact Screening Levels

Pollutant	Emission Rate		
	Pounds/Hour	Pounds/Day	Tons/Year
NO_X	25	250	40
SO_X	25	250	40
CO	100	550	100
PM_{10}	--	100	15
Lead	--	3.2	0.6
VOC, ROG	--	137	15
$PM_{2.5}$[a]	--	67	10

SOURCE: SDAPCD, Rules 20.1, 20.2, 20.3; City of San Diego 2016.
[a]The City does not specify a threshold for $PM_{2.5}$. Threshold here is based on SDAPCD, Rules 20.1, 20.2, 20.3.
Note: The U.S. EPA uses the term VOC and CARB's Emission Inventory Branch (EIB) uses the term ROG. ROG is similar, but not identical to VOC, which is based on U.S. EPA's exempt VOC list. There are minor deviations between compounds that define each term; however, the emissions of VOC and ROG are essentially the same for the emission sources considered in this analysis (CARB 2000b, 2004).

6.0 Air Quality Assessment

Emissions would result from construction and operation of the project. Construction impacts are short term and result from fugitive dust, equipment exhaust, and indirect effects associated with construction workers and deliveries. Operational emissions include aviation sources, on-road mobile sources, and area source.

6.1 Construction Emissions

The project site is located in San Diego, California. According to the *Aviation Emissions and Air Quality Handbook*, projects located in California should use the most recent version of the CARB Emissions Factor Model for on-road mobile sources and CARB's Off-road Model for off-road emissions sources, such as construction equipment (FAA 2015). In California, CARB and local air districts have incorporated these models into several tools for estimating air emissions, such as the California Emissions Estimator Model (CalEEMod) and the Road Construction Emissions Model. CalEEMod is used for land use development projects, such as the development of a commercial building or residential subdivision. The Road Construction Emission Model is used for estimating emissions from construction only and roadway projects.

For this analysis, construction emissions were calculated using CalEEMod version 2022.1 (California Air Pollution Control Officers Association 2022) which incorporates the most currently approved Emissions Factor Model and Off-Road emissions factors models. The CalEEMod program is a tool used to estimate air emissions resulting from land development projects based on California-specific emission factors.

Construction-related activities are temporary, short-term sources of air emissions. Sources of construction-related air emissions include:

- Fugitive dust from grading activities;
- Construction equipment exhaust;
- Construction-related trips by workers, delivery trucks, and material-hauling trucks; and
- Construction-related power consumption.

Construction-related pollutants result from dust raised during demolition and grading, emissions from construction vehicles, and chemicals used during construction. Fugitive dust emissions vary greatly during construction and are dependent on the amount and type of activity, silt content of the soil, and the weather. Vehicles moving over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces are all sources of fugitive dust. Construction operations are subject to the requirements established in Regulation 4, Rules 52, 54, and 55, of the SDAPCD's rules and regulations.

Heavy-duty construction equipment is usually diesel powered. In general, emissions from diesel-powered equipment contain more NO_X, SO_X, and particulate matter than gasoline-powered engines. However, diesel-powered engines generally produce less CO and less ROG than do gasoline-powered engines. Standard construction equipment includes tractors/loaders/backhoes, rubber-tired dozers, excavators, graders, cranes, forklifts, rollers, paving equipment, generator sets, welders, cement and mortar mixers, and air compressors. Construction was modeled beginning in June 2023 and lasting for approximately 10 months.

Table 5 shows the total projected construction maximum daily emission levels for each criteria pollutant and compares the emissions (in pounds per day) to the City's screening levels. Table 6 summarizes the total annual emissions (in tons per year) and compares them to the General

Conformity *de minimis* levels. The CalEEMod output files for construction emissions are contained in Attachment 1.

Table 5
Summary of Maximum Daily Construction Emissions
(pounds per day)

Construction	Emissions					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Site Preparation	4	40	36	<1	22	12
Building Construction	1	12	14	<1	1	1
Paving	2	8	11	<1	1	<1
Maximum Daily Emissions	**4**	**40**	**36**	**<1**	**22**	**12**
City of San Diego Significance Threshold	*137*	*250*	*550*	*250*	*100*	*67*

Table 6
Summary of Total Annual Construction Emissions
(tons per year)

Construction	Emissions					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2023	0.11	1.06	1.17	<0.005	0.16	0.10
2024	0.03	0.21	0.26	<0.005	0.01	0.01
Total	0.14	1.27	1.43	<0.005	0.17	0.11
General Conformity de minimis level	25	25	100	--	--	--

Standard dust control measures would be implemented as a part of project construction in accordance with SDAPCD rules and regulations (Rules 50, 51, 52, 54, and 55) for controlling emissions from fugitive dust and fumes:

- Water the grading areas a minimum of twice daily to minimize fugitive dust.
- Provide sufficient erosion control to prevent washout of silty material onto public roads.
- Cover haul trucks or maintain at least 12 inches of freeboard to reduce blow-off during hauling.
- Periodically sweep up dirt and debris spilled onto paved surfaces to reduce re-suspension of particulate matter caused by vehicle movement. Clean approach routes to construction sites of construction-related dirt.

Fugitive dust emissions were calculated using CalEEMod default values and did not take into account the required dust control measures. Thus, the emissions shown in Table 5 are conservative. It should also be noted that all construction equipment is subject to the CARB In-Use Off-Road Diesel-Fueled Fleets Regulation. This regulation, which applies to all off-road diesel vehicles 25 horsepower or greater, limits unnecessary idling to 5 minutes, requires all construction fleets to be labeled and reported to CARB, bans Tier 0 equipment and phases out Tier 1 and 2 equipment (thereby replacing fleets with cleaner equipment), and requires that fleets comply with Best Available Control Technology requirements.

As shown in Table 5, maximum daily construction emissions associated with the project are projected to be less than the applicable City screening levels for all criteria pollutants.

Additionally, as shown in Table 6, total annual construction emissions would be well less than the applicable General Conformity *de minimis* levels. Therefore, air quality impacts during construction activities would not result in adverse air quality impacts and a General Conformity determination is neither applicable nor required.

6.2 Operation Emissions

Operational emissions occur from ground sources within the immediate vicinity of the project, such as ground support equipment, aircraft on the ground and in flight, and vehicles traveling to and from Montgomery-Gibbs Executive Airport. For operating emissions, the affected environment includes Montgomery Field as well as surrounding areas where aircraft arriving and departing from Montgomery-Gibbs Executive Airport are below the mixing height, generally assumed to be 3,000 feet above field elevation. According to the FAA, aircraft emissions above the mixing height do not affect air pollution concentrations at ground level and are thus presumed to conform to the SIP.

The FAA's Aviation Environmental Design Tool (AEDT) version 3b was used to model the change in operational aviation air quality emissions at Montgomery-Gibbs Executive Airport that would result from project operation. AEDT 3b is a modeling tool that calculates noise, fuel burn, and emissions associated with aviation operations. Aircraft emissions are a function of the number of aircraft operations expressed as landing and takeoff cycles, the aircraft fleet mix, and the length of time aircraft spend in each of the modes of operation defined in AEDT. AEDT also calculates emissions from auxiliary power units and ground support equipment; however, there is no auxiliary power units usage at Montgomery-Gibbs Executive Airport.

Existing AEDT modeling data for Montgomery-Gibbs Executive Airport in the baseline year of 2017 were obtained, and SDFR operations were added to the model. Baseline 2017 emissions were then projected to existing year 2023 through future year 2050 using current annual operations and future projection data for Montgomery-Gibbs Executive Airport obtained from the City (City of San Diego 2022). As discussed in Section 2.0, SDFR currently operates three helicopters consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk. By the first operational year, an additional Lockheed Martin/SikorskyS70i Firehawk helicopter would be included in the fleet. The final Bell 412 helicopter would be added to the fleet five years after opening year.

Table 7 summarizes Montgomery-Gibbs Executive Airport baseline year 2017 and existing year 2023 through future year 2050 daily emissions without the project. Table 8 summarizes the project-only daily AirOps emissions. Table 9 summarizes the existing year 2023 through future year 2050 daily emissions without the project. Note that these emission projections are conservative since they assume no improvement in aircraft emission rates.

Table 10 summarizes the maximum annual project-only AirOps emissions and compares them to the General Conformity *de minimis* levels.

Table 7 Montgomery-Gibbs Executive Airport Emissions without Project (pounds per day)						
Year	Emissions					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2017	1,400	124	53,708	66	41	41
2023	2,090	185	80,186	98	61	61
2024	2,094	185	80,347	98	61	61
2025	2,098	185	80,506	98	61	61
2026	2,102	186	80,665	98	61	61
2027	2,106	186	80,825	99	61	61
2028	2,110	186	80,985	99	61	61
2029	2,115	187	81,145	99	62	62
2030	2,119	187	81,307	99	62	62
2031	2,123	188	81,468	99	62	62
2032	2,127	188	81,630	100	62	62
2033	2,132	188	81,793	100	62	62
2034	2,136	189	81,956	100	62	62
2035	2,140	189	82,119	100	62	62
2036	2,144	189	82,283	100	62	62
2037	2,149	190	82,447	101	63	63
2038	2,153	190	82,612	101	63	63
2039	2,157	191	82,778	101	63	63
2040	2,161	191	82,943	101	63	63
2041	2,166	191	83,110	101	63	63
2042	2,170	192	83,276	102	63	63
2043	2,175	192	83,444	102	63	63
2044	2,179	192	83,611	102	63	63
2045	2,183	193	83,780	102	64	64
2046	2,188	193	83,948	102	64	64
2047	2,192	194	84,117	103	64	64
2048	2,197	194	84,287	103	64	64
2049	2,201	194	84,457	103	64	64
2050	2,205	195	84,628	103	64	64

Table 8 Maximum Daily Project-Only AirOps Emissions (pounds per day)						
	Emissions					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
AirOps Emissions	1	16	12	3	<1	<1
City of San Diego Significance Threshold	*137*	*250*	*550*	*250*	*100*	*67*

Table 9 Montgomery-Gibbs Executive Airport Emissions with Project (pounds per day)						
	Emissions					
Year	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2023	2,091	200	200	101	61	61
2024	2,095	201	201	101	61	61
2025	2,099	201	201	102	61	61
2026	2,103	201	201	102	61	61
2027	2,107	202	202	102	61	61
2028	2,111	202	202	102	61	61
2029	2,116	203	203	102	62	62
2030	2,120	203	203	102	62	62
2031	2,124	203	203	103	62	62
2032	2,128	204	204	103	62	62
2033	2,132	204	204	103	62	62
2034	2,137	204	204	103	62	62
2035	2,141	205	205	103	62	62
2036	2,145	205	205	104	62	62
2037	2,150	206	206	104	63	63
2038	2,154	206	206	104	63	63
2039	2,158	206	206	104	63	63
2040	2,162	207	207	104	63	63
2041	2,167	207	207	105	63	63
2042	2,171	207	207	105	63	63
2043	2,175	208	208	105	63	63
2044	2,180	208	208	105	63	63
2045	2,184	209	209	106	64	64
2046	2,189	209	209	106	64	64
2047	2,193	209	209	106	64	64
2048	2,197	210	210	106	64	64
2049	2,202	210	210	106	64	64
2050	2,206	211	211	107	64	64

Table 10 Maximum Annual Project-Only AirOps Emissions (tons per year)						
	Emissions					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
AirOps Emissions	0.17	2.87	2.21	0.60	<0.01	<0.01
General Conformity de minimis level	*25*	*25*	*100*	--	--	--

As shown in Table 8, maximum daily AirOps emissions are projected to be less than the applicable City's screening levels for all criteria pollutants.

As shown in Table 10, total annual AirOps emissions would be well less than the applicable General Conformity *de minimis* levels. Therefore, air quality impacts during operation would not result in adverse air quality impacts and a General Conformity determination is neither applicable nor required.

AEDT modeling data and postprocessing calculations are provided in Attachment 2.

6.3 General Conformity Applicability Analysis

General Conformity covers most aspects of airport activities funded by federal agencies. In summary, the purpose of the General Conformity Rule is to (FAA 2015):

- Ensure that federal activities do not cause or contribute to new violations of the NAAQS;
- Ensure that actions do not increase the frequency or severity of any existing violation of the NAAQS; and
- Ensure that attainment of the NAAQS is no delayed.

The following applicability analysis determines how and to what degree General Conformity applies to the project.

1. *Will the action occur in a nonattainment or maintenance area(s);*

An airport action is subject to General Conformity regulations only if it would occur in a non-attainment or maintenance area. The project is located within the SDAB. The SDAB is a federal severe non-attainment area for 8-hour ozone, as well as a maintenance/attainment area for CO. Therefore, the General Conformity Rule is applicable to the project emissions of CO and ozone precursors (VOC and NO_X).

2. *Does a specific exemption allowed in the General Conformity Rule apply to the action;*

The General Conformity regulations make allowances by exemption for instances where emissions associated with an action are not "reasonably foreseeable," are not expected to increase emissions, will affect an increase that is of de minimis impact, or are to be implemented as part of a conforming land management plan (FAA 2015).

The U.S. EPA identified the following federal actions (included here if they relate to airport actions) as exempt under the General Conformity Rule. The U.S. EPA also provided illustrative examples of exempt actions in the preamble to the General Conformity Rule, noting that the exemptions were too numerous to list in the Rule. The actions are not subject to General Conformity requirements under 40 CFR Sections 93.153(c), (d), (e), and (f) because the U.S. EPA determined that they have minimal (i.e., *de minimis*) emission levels. The actions are:

1) Actions covered by the Transportation Conformity regulations (40 CFR Section 93.153(a));
2) Actions having net total direct and indirect emissions below the *de minimis* levels specified for each criteria pollutant (40 CFR Section 93.153(c)(1));

3) Air traffic control activities and adopting approach, departure, and enroute procedures for air operations. 58 FR 63214, 63229.
4) Routine installation and operation of aviation navigational aids. 58 FR 63214, 63229.
5) Actions included on an agency "presumed to conform" list (40 CFR Section 93.153(f));
6) Actions specifically listed in the rule as exempt, including:
    a) routine maintenance and repair activities (40 CFR Section 93.153(c)(2));
    b) transfers of ownership of interests, land facilities, and real property (40 CFR Section 93.153(c)(2)(xiv));
    c) emissions from remedial or removal actions authorized under the Comprehensive Environmental Resource Compensation and Liability Act (CERCLA) (40 CFR Section 93.153(d)(5));
    d) actions responding to natural disasters or emergencies (40 CFR Section 93.153(d)(2));
    e) demonstrations improving air quality research or having no harmful environmental effects (40 CFR Section 93.153(d)(3); or:
    f) administrative, planning, enforcement, and inspection activities (40 CFR Sections 93.153(c)(6), 93.153(c)(xii), and inspection under 93.153(c)(v), respectively.

As shown in Tables 6 and 10, construction and operational emissions associated with the project are anticipated to be well less than the General Conformity *de minimis* levels for VOC, NO_X, and CO. Because emissions of non-attainment and maintenance pollutants would be less than the General Conformity *de minimis* levels, the project would be exempt from the General Conformity Rule per 40 CFR Section 93.153(c)(1) (as noted in (2) above).

3. *Is the action, or portions of the project, included on the federal agency's list of "presumed to conform activities";*

For General Conformity purposes, the U.S. EPA regulations allow federal agencies to develop a list of actions whose emissions are typically below the *de minimis* thresholds for the various criteria pollutants. The FAA has published a list of actions presumed to conform (Federal Presumed to Conform Actions Under General Conformity, 72 Federal Register 41565, July 30, 2007). As discussed above, project emissions would be less than the General Conformity *de minimis* levels.

4. *Do the total direct and indirect air emissions associated with the action exceed the General Conformity de minimis levels;*

As discussed above, project emissions would be less than the General Conformity *de minimis* levels.

5. *Does the EPA-approved SIP have an emissions budget against which the emissions associated with the action could be compared and is the budget inclusive of the action;*

Provisions of the General Conformity Rule also allow airports to prepare and submit a facility-wide emissions budget for inclusion in the U.S. EPA approved SIP for a non-attainment or maintenance area. The budget is established for a set time period and specifies either annual or seasonal quantities of emissions that must not be exceeded. The project is not a part of a facility-wide emissions budget;

however, as discussed above, project emissions would be less than the General Conformity *de minimis* levels and is therefore not subject to General Conformity requirements.

7.0 Conclusions

Montgomery-Gibbs Executive Airport has been operating as public-use airport since the City purchased Gibbs Field in 1947. The project would construct hangar buildings and concrete apron space to accommodate the current and future needs of the AirOps fleet. The project would allow for the addition of two helicopters to the existing SDFR fleet. Emissions would result from construction and operation of the project. An airport action is subject to General Conformity regulations only if it would occur in a non-attainment or maintenance area. The project is located within the SDAB. The SDAB is a federal severe non-attainment area for 8-hour ozone, as well as a maintenance/attainment area for CO. Therefore, the General Conformity Rule is applicable to the project emissions of CO and ozone precursors (VOC and NO_X). As shown in Tables 6 and 10, construction and operational emissions associated with the project are anticipated to be well less than the General Conformity *de minimis* levels for VOC, NO_X, and CO. Because emissions of non-attainment and maintenance pollutants would be less than the General Conformity *de minimis* levels, the project would be exempt from the General Conformity Rule per 40 CFR Section 93.153(c)(1).

8.0 References Cited

California Air Pollution Control Officers Association (CAPCOA)

2017 California Emissions Estimator model (CalEEMod). User's Guide Version 2016.3.2. October, 2017.

California Air Resources Board (CARB)

2000a Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. California Air Resources Board. Stationary Source Division, Mobile Source Control Division. October.

2000b FACT SHEET #1: Development of Organic Emission Estimates For California's Emission Inventory and Air Quality Models. Prepared by the California Air Resources Board, Planning and Technical Support Division, Modeling and Meteorology Branch and Emission Inventory Branch. Accessed at https://www.arb.ca.gov/ei/speciate/factsheets_model_ei_speciation_tog_8_00.pdf. August 2000.

2004 Definitions of VOC and ROG. Accessed at extension://elhekieabhbkpmcefcoobjddigjcaa dp/https://www.arb.ca.gov/ei/speciate/voc_rog_dfn_11_04.pdf. Updated November 2004.

2005 Air Quality and Land Use Handbook: A Community Health Perspective. California Air Resources Board. April.

2016 Ambient Air Quality Standards. California Air Resources Board. May 4

2023 California Air Quality Data Statistics. Top 4 Summary and Hourly Listing. Available at http://www.arb.ca.gov/adam/welcome.html. Accessed on February 14, 2023.

Federal Aviation Administration (FAA)
2015 Aviation Emissions and Air Quality Handbook Version 3 Update 1, January. Available at: https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/media/Air_Quality_Handbook_Appendices.pdf.

Office of Environmental Health Hazard Assessment (OEHHA)
2015 Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments (Guidance Manual), February.

San Diego, City of
2016 California Environmental Quality Act Significance Determination Thresholds. July.

San Diego Air Pollution Control District (SDAPCD)
1992 1991/1992 Regional Air Quality Strategies. Air Pollution Control District. June.

U.S. Environmental Protection Agency (U.S. EPA)
2016 Criteria Air Pollutants, Particulate Matter. Available at: https://www3.epa.gov/airquality/particlepollution/index.html. Last updated February 23.

Western Regional Climate Center
2019 Western U.S. Climate Historical Summaries. Available at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7740 and http://www.wrcc.dri.edu/cgi-bin/clilcd.pl?ca23188. Accessed on August 15, 2019.

ATTACHMENTS

ATTACHMENT 1

California Emissions Estimator Model Output – Project Emissions

San Diego Fire-Rescue AirOps Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	San Diego Fire-Rescue AirOps
Lead Agency	City of San Diego
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	19.8
Location	32.81842766506628, -117.13573244476846
County	San Diego
City	San Diego
Air District	San Diego County APCD
Air Basin	San Diego
TAZ	6901
EDFZ	12
Electric Utility	San Diego Gas & Electric
Gas Utility	San Diego Gas & Electric

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
Unrefrigerated Warehouse-No Rail	32.0	1000sqft	6.50	32,000	0.00	0.00	—	—

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.	4.79	4.02	39.8	36.4	0.05	1.81	19.8	21.6	1.66	10.1	11.8	—	5,468	5,468	0.22	0.05	0.91	5,489
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.58	1.76	12.1	13.9	0.02	0.55	0.15	0.70	0.51	0.04	0.55	—	2,658	2,658	0.11	0.04	0.02	2,674
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.75	0.63	5.81	6.43	0.01	0.27	0.60	0.87	0.25	0.29	0.54	—	1,190	1,190	0.05	0.02	0.16	1,197
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.14	0.11	1.06	1.17	< 0.005	0.05	0.11	0.16	0.04	0.05	0.10	—	197	197	0.01	< 0.005	0.03	198

2.2. 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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2023	4.79	4.02	39.8	36.4	0.05	1.81	19.8	21.6	1.66	10.1	11.8	—	5,468	5,468	0.22	0.05	0.91	5,489
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	1.58	1.32	12.1	13.9	0.02	0.55	0.15	0.70	0.51	0.04	0.55	—	2,658	2,658	0.11	0.04	0.02	2,674
2024	1.51	1.76	11.5	13.8	0.02	0.50	0.15	0.65	0.46	0.04	0.50	—	2,654	2,654	0.11	0.04	0.02	2,670
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.75	0.63	5.81	6.43	0.01	0.27	0.60	0.87	0.25	0.29	0.54	—	1,190	1,190	0.05	0.02	0.16	1,197
2024	0.15	0.17	1.13	1.42	< 0.005	0.05	0.02	0.07	0.05	< 0.005	0.05	—	251	251	0.01	< 0.005	0.04	253
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.14	0.11	1.06	1.17	< 0.005	0.05	0.11	0.16	0.04	0.05	0.10	—	197	197	0.01	< 0.005	0.03	198
2024	0.03	0.03	0.21	0.26	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	41.6	41.6	< 0.005	< 0.005	0.01	41.9

3. Construction Emissions Details

3.1. Site Preparation (2023) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.70	3.95	39.7	35.5	0.05	1.81	—	1.81	1.66	—	1.66	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.09	0.97	< 0.005	0.05	—	0.05	0.05	—	0.05	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.20	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	0.92	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	173	173	0.01	0.01	0.73	175
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.50	4.50	< 0.005	< 0.005	0.01	4.57
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.75	0.75	< 0.005	< 0.005	< 0.005	0.76
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Building Construction (2023) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.50	1.26	11.8	13.2	0.02	0.55	—	0.55	0.51	—	0.51	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.50	1.26	11.8	13.2	0.02	0.55	—	0.55	0.51	—	0.51	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.59	0.49	4.62	5.16	0.01	0.22	—	0.22	0.20	—	0.20	—	938	938	0.04	0.01	—	942

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.84	0.94	< 0.005	0.04	—	0.04	0.04	—	0.04	—	155	155	0.01	< 0.005	—	156
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.71	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	133	133	0.01	< 0.005	0.56	135
Vendor	0.01	0.01	0.19	0.09	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	136	136	0.01	0.02	0.34	142
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.05	0.62	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	125	125	0.01	< 0.005	0.01	127
Vendor	0.01	0.01	0.20	0.09	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	136	136	0.01	0.02	0.01	142
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.02	0.25	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	49.4	49.4	< 0.005	< 0.005	0.10	50.1
Vendor	< 0.005	< 0.005	0.08	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.1	53.1	< 0.005	0.01	0.06	55.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.18	8.18	< 0.005	< 0.005	0.02	8.30
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.78	8.78	< 0.005	< 0.005	0.01	9.18
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2024) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.07	0.68	0.80	< 0.005	0.03	—	0.03	0.03	—	0.03	—	145	145	0.01	< 0.005	—	146
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.12	0.15	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.1	24.1	< 0.005	< 0.005	—	24.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.06	0.06	0.05	0.58	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	123	123	0.01	< 0.005	0.01	124
Vendor	0.01	0.01	0.19	0.09	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	134	134	0.01	0.02	0.01	139
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.51	7.51	< 0.005	< 0.005	0.01	7.62
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.11	8.11	< 0.005	< 0.005	0.01	8.46
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.24	1.24	< 0.005	< 0.005	< 0.005	1.26
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.34	1.34	< 0.005	< 0.005	< 0.005	1.40
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Paving (2024) - 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
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.06	0.05	0.43	0.55	< 0.005	0.02	—	0.02	0.02	—	0.02	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	—	0.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.65	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	137	137	0.01	0.01	0.02	139
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.58	7.58	< 0.005	< 0.005	0.01	7.69
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.25	1.25	< 0.005	< 0.005	< 0.005	1.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequest ered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Remove d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequest ered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Remove d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Site Preparation	Site Preparation	6/1/2023	6/14/2023	5.00	10.0	—
Building Construction	Building Construction	6/15/2023	1/31/2024	5.00	165	—
Paving	Paving	2/1/2024	2/28/2024	5.00	20.0	—

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
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20

Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	12.0	LDA,LDT1,LDT2
Site Preparation	Vendor	—	7.63	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	13.4	12.0	LDA,LDT1,LDT2
Building Construction	Vendor	5.24	7.63	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	12.0	LDA,LDT1,LDT2
Paving	Vendor	—	7.63	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

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)

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 (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	15.0	0.00	—
Paving	0.00	0.00	0.00	0.00	6.50

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Unrefrigerated Warehouse-No Rail	6.50	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	589	0.03	< 0.005
2024	0.00	589	0.03	< 0.005

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	8.91	annual days of extreme heat
Extreme Precipitation	2.80	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	8.11	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 (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth 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 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
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	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	0	0	0	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	1	1	1	2
Wildfire	1	1	1	2
Flooding	1	1	1	2
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	42.6
AQ-PM	33.5
AQ-DPM	90.0
Drinking Water	29.0
Lead Risk Housing	8.29
Pesticides	32.4
Toxic Releases	33.2
Traffic	78.7
Effect Indicators	—

CleanUp Sites	95.4
Groundwater	90.7
Haz Waste Facilities/Generators	98.9
Impaired Water Bodies	0.00
Solid Waste	99.3
Sensitive Population	—
Asthma	48.3
Cardio-vascular	20.6
Low Birth Weights	61.7
Socioeconomic Factor Indicators	—
Education	26.9
Housing	67.7
Linguistic	48.7
Poverty	18.9
Unemployment	13.2

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	65.78981137
Employed	68.92082638
Median HI	67.35531888
Education	—
Bachelor's or higher	77.67226999
High school enrollment	19.96663673
Preschool enrollment	67.90709611

Transportation	—
Auto Access	82.44578468
Active commuting	41.78108559
Social	—
2-parent households	53.53522392
Voting	63.04375722
Neighborhood	—
Alcohol availability	73.3478763
Park access	60.25920698
Retail density	96.62517644
Supermarket access	29.34684974
Tree canopy	11.66431413
Housing	—
Homeownership	46.58026434
Housing habitability	49.36481458
Low-inc homeowner severe housing cost burden	24.90696779
Low-inc renter severe housing cost burden	76.10676248
Uncrowded housing	56.30694213
Health Outcomes	—
Insured adults	63.35172591
Arthritis	81.7
Asthma ER Admissions	51.4
High Blood Pressure	90.0
Cancer (excluding skin)	49.7
Asthma	76.7
Coronary Heart Disease	83.6
Chronic Obstructive Pulmonary Disease	76.7

Diagnosed Diabetes	87.3
Life Expectancy at Birth	18.5
Cognitively Disabled	82.5
Physically Disabled	57.4
Heart Attack ER Admissions	87.0
Mental Health Not Good	67.2
Chronic Kidney Disease	85.5
Obesity	80.7
Pedestrian Injuries	99.6
Physical Health Not Good	84.3
Stroke	84.7
Health Risk Behaviors	—
Binge Drinking	10.6
Current Smoker	62.2
No Leisure Time for Physical Activity	71.9
Climate Change Exposures	—
Wildfire Risk	1.3
SLR Inundation Area	0.0
Children	7.3
Elderly	70.8
English Speaking	36.9
Foreign-born	50.7
Outdoor Workers	88.6
Climate Change Adaptive Capacity	—
Impervious Surface Cover	13.4
Traffic Density	86.9
Traffic Access	72.8

Other Indices	—
Hardship	26.3
Other Decision Support	—
2016 Voting	65.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	53.0
Healthy Places Index Score for Project Location (b)	70.0
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

Screen	Justification
Land Use	32,000 square foot hangar 6.5 acres
Construction: Construction Phases	10 month construction schedule

Construction: Paving	Paved site

ATTACHMENT 2

Aviation Environmental Design Tool
Modeling and Postprocessing Data

San Diego Fire-Rescue Operations Hangar Project - Annual Operations

	Firehawks	Bells
Existing	1	2
Opening Year	2	2
5 Years	2	3

Daily Operations	5	flights
Annual Operations	1825	flights

Year	Without Project Annual Operations	% Increase Over 2017	With Project Annual Operations
2017	201,631	0.0%	203,456
2018	224,237	11.2%	226,062
2019	246,851	22.4%	248,676
2020	264,527	31.2%	266,352
2021	298,946	48.3%	300,771
2022	300,435	49.0%	302,260
2023	301,036	49.3%	302,861
2024	301,638	49.6%	303,463
2025	302,234	49.9%	304,059
2026	302,832	50.2%	304,657
2027	303,432	50.5%	305,257
2028	304,033	50.8%	305,858
2029	304,636	51.1%	306,461
2030	305,241	51.4%	307,066
2031	305,848	51.7%	307,673
2032	306,456	52.0%	308,281
2033	307,066	52.3%	308,891
2034	307,678	52.6%	309,503
2035	308,292	52.9%	310,117
2036	308,907	53.2%	310,732
2037	309,524	53.5%	311,349
2038	310,143	53.8%	311,968
2039	310,764	54.1%	312,589
2040	311,386	54.4%	313,211
2041	312,010	54.7%	313,835
2042	312,636	55.1%	314,461
2043	313,264	55.4%	315,089
2044	313,894	55.7%	315,719
2045	314,525	56.0%	316,350
2046	315,158	56.3%	316,983
2047	315,793	56.6%	317,618
2048	316,430	56.9%	318,255
2049	317,069	57.3%	318,894
2050	317,709	57.6%	319,534

Baseline 2017

Operation Group	Mode	Fuel (lb)	Distance (mi)	Duration	CO (lb)	HC (lb)	TOG (lb)	VOC (lb)	NMHC (lb)	NOx (lb)	nvPM Mass (lb)	PMSO (lb)	PMFO (lb)	CO2 (lb)	H2O (lb)	SOx (lb)	PM 2.5 (lb)	PM 10 (lb)
C_2017_Basecase_OPS	Taxi Out	2,712.78	0.00	61.68	2,421.71	143.35	145.96	129.52	133.94	2.74	0.05	0.12	0.86	8,558.81	3,355.70	3.18	1.02	1.02
C_2017_Basecase_OPS	Climb Ground	3,044.76	75.70	62.90	2,693.34	147.01	149.56	132.59	137.14	4.09	0.06	0.13	1.17	9,606.23	3,766.37	3.57	1.35	1.35
C_2017_Basecase_OPS	Climb Below 1000	4,192.64	959.64	65.85	3,725.25	161.15	163.41	144.41	149.49	8.61	0.07	0.17	2.29	13,227.79	5,186.30	4.91	2.53	2.53
C_2017_Basecase_OPS	Climb Below Mixing Height	5,124.79	1,553.93	72.49	4,602.54	172.01	174.07	153.50	158.99	11.63	0.10	0.21	3.07	16,168.71	6,339.36	6.00	3.38	3.38
C_2017_Basecase_OPS	Climb Below 10000	8,297.72	3,876.23	96.04	8,101.20	214.17	215.40	188.74	195.82	20.48	0.73	0.43	5.61	26,179.31	10,264.28	9.72	6.76	6.76
C_2017_Basecase_OPS	Above 10000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_2017_Basecase_OPS	Descend Below 10000	7,101.18	4,467.65	49.29	7,275.33	131.54	131.92	115.25	119.66	15.83	0.53	0.35	5.05	22,404.23	8,784.16	8.32	5.93	5.93
C_2017_Basecase_OPS	Descend Below Mixing Height	5,153.11	2,996.42	37.25	5,054.03	102.20	102.81	90.09	93.47	12.61	0.14	0.21	3.49	16,258.06	6,374.40	6.04	3.85	3.85
C_2017_Basecase_OPS	Descend Below 1000	3,430.16	2,015.60	25.92	3,250.32	77.10	77.77	68.35	70.86	9.39	0.06	0.13	2.39	10,822.15	4,243.10	4.02	2.58	2.58
C_2017_Basecase_OPS	Descend Ground	801.57	25.37	19.17	657.93	40.14	41.39	37.19	38.33	1.16	0.02	0.03	0.29	2,528.96	991.54	0.94	0.34	0.34
C_2017_Basecase_OPS	Taxi In	680.52	0.00	18.59	549.93	38.77	40.02	36.00	37.09	0.80	0.02	0.03	0.23	2,147.04	841.80	0.80	0.28	0.28
C_2017_Basecase_OPS	Full Flight	15,398.90	8,343.88	145.33	15,376.54	345.70	347.32	303.99	315.48	36.31	1.26	0.78	10.66	48,583.54	19,048.44	18.04	12.70	12.70
TOTAL		55,938.13	24,314.42	654.52	53,708.12	1,573.14	1,589.63	1,399.63	1,450.27	123.65	3.04	2.59	35.11	176,484.83	69,195.45	65.54	40.72	40.72

Emission Projections - No Prj

Year	Operations % Increase	Fuel (lb)	Distance (mi)	Duration	CO (lb)	HC (lb)	TOG (lb)	VOC (lb)	NMHC (lb)	NOx (lb)	nvPM Mass (lb)	PMSO (lb)	PMFO (lb)	CO2 (lb)	H2O (lb)	SOx (lb)	PM 2.5 (lb)	PM 10 (lb)
Baseline 2017		55,938.13	24,314.42	654.52	53,708.12	1,573.14	1,589.63	1,399.63	1,450.27	123.65	3.04	2.59	35.11	176,484.83	69,195.45	65.54	40.72	40.72
2023	49.3%	83,515.88	36,301.54	977.20	80,186.47	2,348.71	2,373.32	2,089.65	2,165.26	184.61	4.54	3.87	52.42	263,492.65	103,309.12	97.85	60.80	60.80
2024	49.6%	83,682.89	36,374.13	979.15	80,346.82	2,353.40	2,378.07	2,093.83	2,169.59	184.98	4.55	3.87	52.52	264,019.58	103,515.72	98.05	60.92	60.92
2025	49.9%	83,848.24	36,446.00	981.09	80,505.58	2,358.05	2,382.77	2,097.97	2,173.88	185.34	4.56	3.88	52.63	264,541.25	103,720.25	98.24	61.04	61.04
2026	50.2%	84,014.14	36,518.12	983.03	80,664.87	2,362.72	2,387.48	2,102.12	2,178.18	185.71	4.57	3.89	52.73	265,064.67	103,925.47	98.44	61.16	61.16
2027	50.5%	84,180.60	36,590.47	984.98	80,824.69	2,367.40	2,392.21	2,106.29	2,182.49	186.08	4.57	3.90	52.84	265,589.84	104,131.38	98.63	61.28	61.28
2028	50.8%	84,347.33	36,662.94	986.93	80,984.77	2,372.09	2,396.95	2,110.46	2,186.82	186.45	4.58	3.91	52.94	266,115.89	104,337.63	98.83	61.40	61.40
2029	51.1%	84,514.62	36,735.66	988.89	81,145.39	2,376.79	2,401.71	2,114.64	2,191.15	186.82	4.59	3.91	53.05	266,643.68	104,544.56	99.02	61.52	61.52
2030	51.4%	84,682.47	36,808.62	990.85	81,306.55	2,381.51	2,406.48	2,118.84	2,195.50	187.19	4.60	3.92	53.15	267,173.23	104,752.19	99.22	61.64	61.64
2031	51.7%	84,850.87	36,881.81	992.82	81,468.23	2,386.25	2,411.26	2,123.06	2,199.87	187.56	4.61	3.93	53.26	267,704.53	104,960.50	99.42	61.77	61.77
2032	52.0%	85,019.54	36,955.13	994.79	81,630.18	2,390.99	2,416.06	2,127.28	2,204.24	187.93	4.62	3.94	53.36	268,236.70	105,169.15	99.61	61.89	61.89
2033	52.3%	85,188.77	37,028.69	996.77	81,792.67	2,395.75	2,420.86	2,131.51	2,208.63	188.31	4.63	3.94	53.47	268,770.63	105,378.49	99.81	62.01	62.01
2034	52.6%	85,358.56	37,102.49	998.76	81,955.69	2,400.53	2,425.69	2,135.76	2,213.03	188.68	4.64	3.95	53.58	269,306.30	105,588.51	100.01	62.14	62.14
2035	52.9%	85,528.90	37,176.53	1,000.75	82,119.24	2,405.32	2,430.53	2,140.02	2,217.45	189.06	4.65	3.96	53.68	269,843.73	105,799.23	100.21	62.26	62.26
2036	53.2%	85,699.52	37,250.69	1,002.75	82,283.05	2,410.12	2,435.38	2,144.29	2,221.87	189.44	4.66	3.97	53.79	270,382.03	106,010.28	100.41	62.38	62.38
2037	53.5%	85,870.69	37,325.10	1,004.75	82,447.40	2,414.93	2,440.24	2,148.57	2,226.31	189.82	4.67	3.98	53.90	270,922.08	106,222.02	100.61	62.51	62.51
2038	53.8%	86,042.42	37,399.74	1,006.76	82,612.28	2,419.76	2,445.12	2,152.87	2,230.76	190.19	4.68	3.98	54.01	271,463.89	106,434.45	100.81	62.63	62.63
2039	54.1%	86,214.70	37,474.63	1,008.78	82,777.70	2,424.60	2,450.02	2,157.18	2,235.23	190.58	4.69	3.99	54.11	272,007.44	106,647.56	101.01	62.76	62.76
2040	54.4%	86,387.26	37,549.63	1,010.80	82,943.38	2,429.46	2,454.92	2,161.50	2,239.70	190.96	4.69	4.00	54.22	272,551.87	106,861.02	101.22	62.89	62.89
2041	54.7%	86,560.38	37,624.88	1,012.82	83,109.59	2,434.33	2,459.84	2,165.83	2,244.19	191.34	4.70	4.01	54.33	273,098.04	107,075.16	101.42	63.01	63.01
2042	55.1%	86,734.05	37,700.37	1,014.86	83,276.34	2,439.21	2,464.78	2,170.18	2,248.69	191.72	4.71	4.02	54.44	273,645.97	107,289.99	101.62	63.14	63.14
2043	55.4%	86,908.27	37,776.10	1,016.89	83,443.62	2,444.11	2,469.73	2,174.54	2,253.21	192.11	4.72	4.02	54.55	274,195.65	107,505.51	101.83	63.26	63.26
2044	55.7%	87,083.05	37,852.07	1,018.94	83,611.43	2,449.02	2,474.70	2,178.91	2,257.74	192.50	4.73	4.03	54.66	274,747.08	107,721.71	102.03	63.39	63.39
2045	56.0%	87,258.11	37,928.16	1,020.99	83,779.51	2,453.95	2,479.67	2,183.29	2,262.28	192.88	4.74	4.04	54.77	275,299.39	107,938.26	102.24	63.52	63.52
2046	56.3%	87,433.72	38,004.49	1,023.04	83,948.12	2,458.89	2,484.66	2,187.68	2,266.83	193.27	4.75	4.05	54.88	275,853.45	108,155.49	102.44	63.65	63.65
2047	56.6%	87,609.89	38,081.07	1,025.10	84,117.27	2,463.84	2,489.67	2,192.09	2,271.40	193.66	4.76	4.06	54.99	276,409.25	108,373.41	102.65	63.78	63.78
2048	56.9%	87,786.61	38,157.88	1,027.17	84,286.94	2,468.81	2,494.69	2,196.51	2,275.98	194.05	4.77	4.06	55.10	276,966.81	108,592.01	102.86	63.90	63.90
2049	57.3%	87,963.89	38,234.94	1,029.25	84,457.15	2,473.80	2,499.73	2,200.95	2,280.58	194.44	4.78	4.07	55.21	277,526.12	108,811.30	103.06	64.03	64.03
2050	57.6%	88,141.44	38,312.12	1,031.32	84,627.63	2,478.79	2,504.77	2,205.39	2,285.18	194.83	4.79	4.08	55.32	278,086.30	109,030.94	103.27	64.16	64.16

Year	Operations % Increase	Fuel (lb)	Distance (mi)	Duration	CO (lb)	HC (lb)	TOG (lb)	VOC (lb)	NMHC (lb)	NOx (lb)	nvPM Mass (lb)	PMSO (lb)	PMFO (lb)	CO2 (lb)	H2O (lb)	SOx (lb)	PM 2.5 (lb)	PM 10 (lb)
Baseline 2017		58,732.71	25,072.47	654.83	53,720.21	1,573.96	1,590.57	1,400.57	1,451.21	139.38	3.04	2.59	35.11	185,301.74	72,652.33	68.82	40.72	40.72
2023	49.3%	86,310.46	37,059.59	977.51	80,198.56	2,349.53	2,374.26	2,090.59	2,166.20	200.34	4.54	3.87	52.42	272,309.56	106,766.00	101.13	60.80	60.80
2024	49.6%	86,477.47	37,132.18	979.46	80,358.91	2,354.22	2,379.01	2,094.77	2,170.53	200.71	4.55	3.87	52.52	272,836.49	106,972.60	101.33	60.92	60.92
2025	49.9%	86,642.82	37,204.05	981.40	80,517.67	2,358.87	2,383.71	2,098.91	2,174.82	201.07	4.56	3.88	52.63	273,358.16	107,177.13	101.52	61.04	61.04
2026	50.2%	86,808.72	37,276.17	983.34	80,676.96	2,363.54	2,388.42	2,103.06	2,179.12	201.44	4.57	3.89	52.73	273,881.58	107,382.35	101.72	61.16	61.16
2027	50.5%	86,975.18	37,348.52	985.29	80,836.78	2,368.22	2,393.15	2,107.23	2,183.43	201.81	4.57	3.90	52.84	274,406.75	107,588.26	101.91	61.28	61.28
2028	50.8%	87,141.91	37,420.99	987.24	80,996.86	2,372.91	2,397.89	2,111.40	2,187.76	202.18	4.58	3.91	52.94	274,932.80	107,794.51	102.11	61.40	61.40
2029	51.1%	87,309.20	37,493.71	989.19	81,157.48	2,377.61	2,402.65	2,115.58	2,192.09	202.55	4.59	3.91	53.05	275,460.59	108,001.44	102.30	61.52	61.52
2030	51.4%	87,477.05	37,566.67	991.16	81,318.64	2,382.33	2,407.42	2,119.78	2,196.44	202.92	4.60	3.92	53.15	275,990.14	108,209.07	102.50	61.64	61.64
2031	51.7%	87,645.45	37,639.86	993.13	81,480.32	2,387.07	2,412.20	2,124.00	2,200.81	203.29	4.61	3.93	53.26	276,521.44	108,417.38	102.70	61.77	61.77
2032	52.0%	87,814.12	37,713.18	995.10	81,642.27	2,391.81	2,417.00	2,128.22	2,205.18	203.66	4.62	3.94	53.36	277,053.61	108,626.03	102.89	61.89	61.89
2033	52.3%	87,983.35	37,786.74	997.08	81,804.76	2,396.57	2,421.80	2,132.45	2,209.57	204.04	4.63	3.94	53.47	277,587.54	108,835.37	103.09	62.01	62.01
2034	52.6%	88,153.14	37,860.54	999.07	81,967.78	2,401.35	2,426.63	2,136.70	2,213.97	204.41	4.64	3.95	53.58	278,123.21	109,045.39	103.29	62.14	62.14
2035	52.9%	88,323.48	37,934.58	1,001.06	82,131.33	2,406.14	2,431.47	2,140.96	2,218.39	204.79	4.65	3.96	53.68	278,660.64	109,256.11	103.49	62.26	62.26
2036	53.2%	88,494.10	38,008.74	1,003.06	82,295.14	2,410.94	2,436.32	2,145.23	2,222.81	205.17	4.66	3.97	53.79	279,198.94	109,467.16	103.69	62.38	62.38
2037	53.5%	88,665.27	38,083.15	1,005.06	82,459.49	2,415.75	2,441.18	2,149.51	2,227.25	205.55	4.67	3.98	53.90	279,738.99	109,678.90	103.89	62.51	62.51
2038	53.8%	88,837.00	38,157.79	1,007.07	82,624.37	2,420.58	2,446.06	2,153.81	2,231.70	205.92	4.68	3.98	54.01	280,280.80	109,891.33	104.09	62.63	62.63
2039	54.1%	89,009.28	38,232.68	1,009.09	82,789.79	2,425.42	2,450.96	2,158.12	2,236.17	206.31	4.69	3.99	54.11	280,824.35	110,104.44	104.29	62.76	62.76
2040	54.4%	89,181.84	38,307.68	1,011.11	82,955.47	2,430.28	2,455.86	2,162.44	2,240.64	206.69	4.69	4.00	54.22	281,368.78	110,317.90	104.50	62.89	62.89
2041	54.7%	89,354.96	38,382.93	1,013.13	83,121.68	2,435.15	2,460.78	2,166.77	2,245.13	207.07	4.70	4.01	54.33	281,914.95	110,532.04	104.70	63.01	63.01
2042	55.1%	89,528.63	38,458.42	1,015.16	83,288.43	2,440.03	2,465.72	2,171.12	2,249.63	207.45	4.71	4.02	54.44	282,462.88	110,746.87	104.90	63.14	63.14
2043	55.4%	89,702.85	38,534.15	1,017.20	83,455.71	2,444.93	2,470.67	2,175.48	2,254.15	207.84	4.72	4.02	54.55	283,012.56	110,962.39	105.11	63.26	63.26
2044	55.7%	89,877.63	38,610.12	1,019.25	83,623.52	2,449.84	2,475.64	2,179.85	2,258.68	208.23	4.73	4.03	54.66	283,563.99	111,178.59	105.31	63.39	63.39
2045	56.0%	90,052.69	38,686.21	1,021.29	83,791.60	2,454.77	2,480.61	2,184.23	2,263.22	208.61	4.74	4.04	54.77	284,116.30	111,395.14	105.52	63.52	63.52
2046	56.3%	90,228.30	38,762.54	1,023.35	83,960.21	2,459.71	2,485.60	2,188.62	2,267.77	209.00	4.75	4.05	54.88	284,670.36	111,612.37	105.72	63.65	63.65
2047	56.6%	90,404.47	38,839.12	1,025.41	84,129.36	2,464.66	2,490.61	2,193.03	2,272.34	209.39	4.76	4.06	54.99	285,226.16	111,830.29	105.93	63.78	63.78
2048	56.9%	90,581.19	38,915.93	1,027.48	84,299.03	2,469.63	2,495.63	2,197.45	2,276.92	209.78	4.77	4.06	55.10	285,783.72	112,048.89	106.14	63.90	63.90
2049	57.3%	90,758.47	38,992.99	1,029.55	84,469.24	2,474.62	2,500.67	2,201.89	2,281.52	210.17	4.78	4.07	55.21	286,343.03	112,268.18	106.34	64.03	64.03
2050	57.6%	90,936.02	39,070.17	1,031.63	84,639.72	2,479.61	2,505.71	2,206.33	2,286.12	210.56	4.79	4.08	55.32	286,903.21	112,487.82	106.55	64.16	64.16

SDFR Existing

Operation Group	Mode	Fuel (lb)	Distance (mi)	Duration	CO (lb)	HC (lb)	TOG (lb)	VOC (lb)	NMHC (lb)	NOx (lb)	nvPM Mass (lb)	PMSO (lb)	PMFO (lb)	CO2 (lb)	H2O (lb)	SOx (lb)	PM 2.5 (lb)	PM 10 (lb)
SDFR Existing	Taxi Out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Existing	Climb Ground	19.41	0.00	0.00	0.09	0.01	0.01	0.01	0.01	0.11	0.00	0.00	0.00	61.23	24.01	0.02	0.00	0.00
SDFR Existing	Climb Below 1000	200.34	56.90	0.02	0.74	0.05	0.06	0.06	0.06	1.13	0.00	0.00	0.00	632.06	247.82	0.23	0.00	0.00
SDFR Existing	Climb Below Mixing Height	200.34	56.90	0.02	0.74	0.05	0.06	0.06	0.06	1.13	0.00	0.00	0.00	632.06	247.82	0.23	0.00	0.00
SDFR Existing	Climb Below 10000	200.34	56.90	0.02	0.74	0.05	0.06	0.06	0.06	1.13	0.00	0.00	0.00	632.06	247.82	0.23	0.00	0.00
SDFR Existing	Above 10000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Existing	Descend Below 10000	214.65	56.81	0.02	0.80	0.06	0.07	0.07	0.07	1.21	0.00	0.00	0.00	677.22	265.52	0.25	0.00	0.00
SDFR Existing	Descend Below Mixing Height	214.65	56.81	0.02	0.80	0.06	0.07	0.07	0.07	1.21	0.00	0.00	0.00	677.22	265.52	0.25	0.00	0.00
SDFR Existing	Descend Below 1000	214.65	56.81	0.02	0.80	0.06	0.07	0.07	0.07	1.21	0.00	0.00	0.00	677.22	265.52	0.25	0.00	0.00
SDFR Existing	Descend Ground	19.73	0.00	0.00	0.09	0.01	0.01	0.01	0.01	0.11	0.00	0.00	0.00	62.25	24.41	0.02	0.00	0.00
SDFR Existing	Taxi In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Existing	Full Flight	414.99	113.71	0.05	1.54	0.11	0.13	0.13	0.13	2.35	0.00	0.00	0.00	1,309.28	513.34	0.49	0.00	0.00
TOTAL		1,699.10	454.84	0.19	6.34	0.46	0.54	0.54	0.54	9.59	0.00	0.00	0.00	5,360.60	2,101.78	1.97	0.00	0.00

Operation Group	Mode	Fuel (lb)	Distance (mi)	Duration	CO (lb)	HC (lb)	TOG (lb)	VOC (lb)	NMHC (lb)	NOx (lb)	nvPM Mass (lb)	PMSO (lb)	PMFO (lb)	CO2 (lb)	H2O (lb)	SOx (lb)	PM 2.5 (lb)	PM 10 (lb)
SDFR Buildout	Taxi Out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Climb Ground	32.76	0.00	0.00	0.17	0.01	0.01	0.01	0.01	0.18	0.00	0.00	0.00	103.35	40.52	0.04	0.00	0.00
SDFR Buildout	Climb Below 1000	329.02	94.83	0.04	1.41	0.10	0.11	0.11	0.11	1.85	0.00	0.00	0.00	1,038.07	407.00	0.39	0.00	0.00
SDFR Buildout	Climb Below Mixing Height	329.02	94.83	0.04	1.41	0.10	0.11	0.11	0.11	1.85	0.00	0.00	0.00	1,038.07	407.00	0.39	0.00	0.00
SDFR Buildout	Climb Below 10000	329.02	94.83	0.04	1.41	0.10	0.11	0.11	0.11	1.85	0.00	0.00	0.00	1,038.07	407.00	0.39	0.00	0.00
SDFR Buildout	Above 10000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Descend Below 10000	353.11	94.68	0.04	1.53	0.10	0.12	0.12	0.12	1.99	0.00	0.00	0.00	1,114.05	436.79	0.41	0.00	0.00
SDFR Buildout	Descend Below Mixing Height	353.11	94.68	0.04	1.53	0.10	0.12	0.12	0.12	1.99	0.00	0.00	0.00	1,114.05	436.79	0.41	0.00	0.00
SDFR Buildout	Descend Below 1000	353.11	94.68	0.04	1.53	0.10	0.12	0.12	0.12	1.99	0.00	0.00	0.00	1,114.05	436.79	0.41	0.00	0.00
SDFR Buildout	Descend Ground	33.30	0.00	0.00	0.17	0.01	0.01	0.01	0.01	0.19	0.00	0.00	0.00	105.08	41.20	0.04	0.00	0.00
SDFR Buildout	Taxi In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Full Flight	682.13	189.52	0.08	2.93	0.20	0.23	0.23	0.23	3.84	0.00	0.00	0.00	2,152.12	843.79	0.80	0.00	0.00
TOTAL		2,794.58	758.05	0.31	12.09	0.82	0.94	0.94	0.94	15.73	0.00	0.00	0.00	8,816.91	3,456.88	3.28	0.00	0.00
	Tons/Year				2.21	0.15	0.17	0.17	0.17	2.87	0.00	0.00	0.00	1,609.09	630.88	0.60	0.00	0.00

Operation Group	Mode	Fuel (lb)	CO2 (lb)	Fuel (gal)	N2O	CH4	lbs CO2E	MT CO2E	Annual MT CO2E
C_2017_Basecase_OPS	Taxi Out	2,712.78	8,558.81	396.61	0.27	0.00	8,639.53	3.92	1,430.37
C_2017_Basecase_OPS	Climb Ground	3,044.76	9,606.23	445.14	0.30	0.00	9,696.83	4.40	1,605.42
C_2017_Basecase_OPS	Climb Below 1000	4,192.64	13,227.79	612.96	0.42	0.00	13,352.55	6.06	2,210.67
C_2017_Basecase_OPS	Climb Below Mixing Height	5,124.79	16,168.71	749.24	0.51	0.00	16,321.21	7.40	2,702.16
C_2017_Basecase_OPS	Climb Below 10000	8,297.72	26,179.31	1,213.12	0.83	0.00	26,426.22	11.99	4,375.16
C_2017_Basecase_OPS	Above 10000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_2017_Basecase_OPS	Descend Below 10000	7,101.18	22,404.23	1,038.18	0.71	0.00	22,615.54	10.26	3,744.26
C_2017_Basecase_OPS	Descend Below Mixing Height	5,153.11	16,258.06	753.38	0.51	0.00	16,411.40	7.44	2,717.09
C_2017_Basecase_OPS	Descend Below 1000	3,430.16	10,822.15	501.49	0.34	0.00	10,924.22	4.96	1,808.63
C_2017_Basecase_OPS	Descend Ground	801.57	2,528.96	117.19	0.08	0.00	2,552.81	1.16	422.65
C_2017_Basecase_OPS	Taxi In	680.52	2,147.04	99.49	0.07	0.00	2,167.29	0.98	358.82
C_2017_Basecase_OPS	Full Flight	15,398.90	48,583.54	2,251.30	1.54	0.00	49,041.76	22.24	8,119.42
TOTAL		**55,938.13**	**176,484.83**	**8,178.09**	**5.59**	**0.00**	**178,149.35**	**80.81**	**29,494.66**

SDFR Buildout	Taxi Out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Climb Ground	32.76	103.35	4.79	0.00	0.00	104.32	0.05	17.27
SDFR Buildout	Climb Below 1000	329.02	1,038.07	48.10	0.03	0.00	1,047.86	0.48	173.49
SDFR Buildout	Climb Below Mixing Height	329.02	1,038.07	48.10	0.03	0.00	1,047.86	0.48	173.49
SDFR Buildout	Climb Below 10000	329.02	1,038.07	48.10	0.03	0.00	1,047.86	0.48	173.49
SDFR Buildout	Above 10000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Descend Below 10000	353.11	1,114.05	51.62	0.04	0.00	1,124.56	0.51	186.18
SDFR Buildout	Descend Below Mixing Height	353.11	1,114.05	51.62	0.04	0.00	1,124.56	0.51	186.18
SDFR Buildout	Descend Below 1000	353.11	1,114.05	51.62	0.04	0.00	1,124.56	0.51	186.18
SDFR Buildout	Descend Ground	33.30	105.08	4.87	0.00	0.00	106.07	0.05	17.56
SDFR Buildout	Taxi In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDFR Buildout	Full Flight	682.13	2,152.12	99.73	0.07	0.00	2,172.42	0.99	359.67
TOTAL		**2,794.58**	**8,816.91**	**408.56**	**0.28**	**0.00**	**8,900.07**	**4.04**	**1,473.51**

		Annual MT CO2E	
Year	**Operations % Increase**	**Without Project**	**With Project**
2017	0.0%	29,494.66	30,968.17
2018	11.2%	32,801.47	34,274.98
2019	22.4%	36,109.46	37,582.96
2020	31.2%	38,695.11	40,168.62
2021	48.3%	43,729.93	45,203.44
2022	49.0%	43,947.74	45,421.25
2023	49.3%	44,035.66	45,509.17
2024	49.6%	44,123.72	45,597.23
2025	49.9%	44,210.90	45,684.41
2026	50.2%	44,298.38	45,771.89
2027	50.5%	44,386.15	45,859.65
2028	50.8%	44,474.06	45,947.57
2029	51.1%	44,562.27	46,035.78
2030	51.4%	44,650.77	46,124.27
2031	51.7%	44,739.56	46,213.07
2032	52.0%	44,828.50	46,302.01
2033	52.3%	44,917.73	46,391.24
2034	52.6%	45,007.25	46,480.76
2035	52.9%	45,097.07	46,570.58
2036	53.2%	45,187.03	46,660.54
2037	53.5%	45,277.29	46,750.79
2038	53.8%	45,367.83	46,841.34
2039	54.1%	45,458.67	46,932.18
2040	54.4%	45,549.66	47,023.17
2041	54.7%	45,640.94	47,114.45
2042	55.1%	45,732.51	47,206.02
2043	55.4%	45,824.37	47,297.88
2044	55.7%	45,916.53	47,390.04
2045	56.0%	46,008.83	47,482.34
2046	56.3%	46,101.43	47,574.94
2047	56.6%	46,194.32	47,667.83
2048	56.9%	46,287.50	47,761.01
2049	57.3%	46,380.97	47,854.48
2050	57.6%	46,474.59	47,948.10

APPENDIX D

Biological Resource Report

This page intentionally left blank

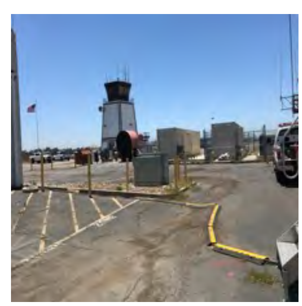
Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II, San Diego, California

Biological Resource Report

WBS # S-18007.02.06

PTS # 625280

July 29, 2020



Prepared for:

City of San Diego

Development Services Department

Prepared by:

City of San Diego - Public Works Department

Environmental and Permitting Support

525 B Street

San Diego, Ca 92101

619.533.3629

Prepared By: ________________________________

Sean Paver, Senior Planner - Biologist

TABLE OF CONTENTS

Tables and Figures

Appendices

1 SUMMARY

The City of San Diego Public Works Department proposes to construct a new, permanent Fire Rescue Air Operations Facility (Project) at Montgomery-Gibbs Executive Airport (MYF). The facility will accommodate the emergency helicopters for the crews that will provide 24 hour on-call services during 365 days per year. The project area would be approximately 3.719 acres, and the project would result in 1.957 acres of new impervious surfaces, including the hangars, fueling stations, heli-tender storage buildings, concrete aprons, ramps, and vehicle parking. The proposed project is located completely within the existing MYF and is primarily outside of the City's Multi-Habitat Planning Area (MHPA) boundary. The access road to the site is the only portion of the project located within the MHPA. Project activities associated with the road is limited to construction access, installation of BMP's, and patching of asphalt that is damaged by construction access.

Jurisdictional delineation of aquatic resources, identified six vernal pools within the Project footprint. The vernal pools are located within disturbed habitat and contained at least one vernal pool indicator species. Fairy shrimp protocol surveys were conducted by a permitted biologist. San Diego fairy shrimp (*Branchinecta sandiegonensis*) were observed in vernal pools within and adjacent to the Project footprint during surveys. Permanent impacts to 0.089 acre of the San Diego Mesa Hardpan Vernal Pools would occur from implementation of the proposed project. Approximately 0.087 acre of those impacts would occur to San Diego Mesa Hardpan Vernal Pools occupied by San Diego Fairy Shrimp.

Biological surveys for sensitive flora and fauna were conducted. Orcutt's brodiaea (*Brodiaea orcuttii*), a MSCP-covered species, was observed within the Project footprint and approximately 132 individuals will be impacted by this project. In addition, Graceful tarplant (*Holocarpha virgata* ssp. *elongata*), a CRPR 4.2 species, and Ashy spike-moss (*Selaginella cinerascens*), a CRPR 4.1 species, was observed within the Project footprint; neither species is a MSCP covered species. Both California gnatcatcher (*Polioptila californica*) and burrowing owl (*Athene cunicularia*), both MSCP covered species, were observed on the airport, outside of the Project footprint; significant impacts to these species are not expected.

2 INTRODUCTION

The City of San Diego Public Works Department proposes to construct a new, permanent Fire-Rescue Air Operations Facility (Project) at Montgomery-Gibbs Executive Airport. The facility will accommodate the emergency helicopters for the crews that will provide 24 hour on-call services during 365 days per year. The crews would provide fire suppression, emergency rescues from remote areas, advanced life support, and medical transport. Currently there is no available hangar space to store the Bell 212HP and 412EP helicopters.

This report summarizes the biological resources present within and adjacent to the proposed project area, analyzes potential impacts to sensitive resources, and proposes mitigation or minimization measures to compensate for potential impacts associated with this project. This analysis satisfies reporting requirements for the California Environmental Quality Act (CEQA), the Multiple Species Conservation Program (MSCP), the Vernal Pool Habitat Conservation Plan (VPHCP), and the City of San Diego's Environmentally Sensitive Lands (ESL) Regulations.

2.1 LOCATION

The project is located at Montgomery-Gibbs Executive Airport (MYF), east of Taxiway C, north of the air traffic control tower (Figure 1 and 2) and encompasses approximately 3.7 acres. The project is located adjacent to the MHPA, in the Kearny Mesa Community Planning Area (Council District 6).

2.2 Project Description

This project encompasses approximately 3.7 acres and will provide new hangar space and a concrete apron to accommodate five helicopters, parking and shelter for a single Heli tender and two fueling tender vehicles. The total area of new hangar space will be approximately 32,000 SF, of which approx. 16,500 SF is existing disturbed and/or impervious area. The new hangar space includes a hangar support area for maintenance offices, overhaul, avionics and storage rooms. The new apron area will be approximately 65,000 SF of 5000 PSI concrete, of which approx. 9,300 SF is existing disturbed and/or impervious area. The project includes two above-ground fuel storage tanks, each with 12,000 gallon capacity (24,000 gallons total). This facility will support and accommodate 24 hour staffing that includes one battalion chief, two captains, two pilots, and four firefighters. Additionally, the proposed project will design and relocate existing utility connections (Sewer, Stormwater, Gas, Water, Power, etc.) within the main access roadway from Ponderosa Avenue and project site. The project will also introduce underground storm water retention features that will capture runoff from the proposed improvements and a parking pad that will be constructed as a separate project adjacent to the southern project boundary. The staging area for the project will be placed on existing paved and/or disturbed area, and is designed to be approximately 4,000 SF.

Construction access to the site will be via the airport perimeter gate at 4302 Ponderosa Avenue, and an unnamed road which leads directly to the site. The project will address any damages to the access road sustained from construction activities and utility relocation. The rehabilitation of the existing access road will include a two-inch overlay of asphalt material in any areas deemed necessary and will not impact any undisturbed areas.

3 Regulatory Context

The following federal, state, and/or local regulations or policies apply to biological resources within the biological study area.

3.1 Applicable Federal Regulations

Applicable federal regulations that apply to the proposed project are discussed in this section.

3.1.1 Federal Endangered Species Act

The federal Endangered Species Act (ESA) provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered ‘take’ under the ESA. Section 9(a) of the ESA defines ‘take’ as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” The ESA is administered by the U.S. Fish and Wildlife Service (USFWS).

3.1.2 Rivers and Harbors Act & Clean Water Act

The Rivers and Harbors Act of 1899 and the Clean Water Act (CWA) regulate project activities within non-marine navigable waters and/or waters of the U.S. The discharge of any pollutant from a point source into navigable waters is illegal unless a permit under the CWA’s provisions is acquired. Permitting for projects that include both permanent and temporary dredging and filling in Wetland and Non-Wetland Waters of the U.S. is overseen by the USACE under Section 404 of the CWA. Projects can be permitted on an individual basis or be covered by one of several approved nationwide permits or regional general permits. In addition, RWQCB issues Water Quality Certifications under Section 401 of the CWA for project activities that fill or dredge within Wetland and Non-Wetland Waters of the U.S. and State, including isolated waters such as vernal pools and other waters showing lack of connectivity to a Traditional Navigable Waters (TNW).

3.1.3 Migratory Bird Treaty Act

All migratory bird species that are native to the U.S. or its territories are protected under the federal MBTA, as amended under the Migratory Bird Treaty Reform Act of 2004. The MBTA prohibits the kill or transport of native migratory birds or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. No permit is issued under the MBTA, and the MBTA does not mandate specific protection. However, typical acceptable requirements include nesting bird surveys during the avian breeding season and avoidance measures if nesting birds are discovered within or adjacent to a project. In addition, the USFWS commonly places restrictions on disturbances allowed near active raptor nests.

3.2 APPLICABLE STATE REGULATIONS

Applicable state regulations that apply to the proposed project are discussed in this section.

3.2.1 California Environmental Quality Act

CEQA requires an environmental review for projects with potentially adverse impacts on the environment. Adverse environmental impacts are typically mitigated in accordance with state laws and regulations.

3.2.2 California Endangered Species Act

The California ESA is similar to the federal ESA in that it provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction.

3.2.3 California Fish and Game Code

The California Fish and Game Code (CFGC, Sections 1600 through 1603) regulates project activities within rivers, streams, lakes, and riparian habitat. CFGC Section 1602 requires an entity to notify CDFW prior to commencing any activity that may do one or more of the following:

- Substantially divert or obstruct the natural flow of any river, stream, or lake;
- Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- Deposit debris, waste, or other materials that could pass into any river, stream, or lake.

CDFW can issue a LSA Agreement for projects that substantially adversely affect CDFW jurisdictional resources. If the activity will not substantially adversely affect any CDFW jurisdictional resources, the entity may commence the activity without a LSA Agreement.

3.2.4 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act regulates water quality for project activities in California. Pursuant to the Porter-Cologne Act, under Section 13000 et seq. of the California Water Code (CWC), the RWQCB issues Water Quality Certifications for project activities that fill or dredge within Wetland and Non-Wetland Waters of the U.S. and State, including isolated waters – such as vernal pools – and other waters showing lack of connectivity to a TNW.

3.3 APPLICABLE CITY OF SAN DIEGO PROGRAMS AND REGULATIONS

Applicable City programs and regulations are discussed in this section.

3.3.1 **City of San Diego MSCP Subarea Plan**

The Subarea Plan (1997) encompasses 206,124 acres within the MSCP Subregional Plan area. The Project study area is located within the Urban areas of the Subarea Plan. The Subarea Plan is characterized by urban land uses with approximately three-quarters either built out or retained as open space/park system. The City Multi-

Habitat Planning Area (MHPA) is a "hard line" preserve developed by the City in cooperation with the wildlife agencies, property owners, developers, and environmental groups. The MHPA identifies biological core resource areas and corridors targeted for conservation, in which only limited development may occur (City of San Diego 1997). The MHPA is considered an urban preserve that is constrained by existing or approved development and is comprised of habitat linkages connecting several large core areas of habitat. The Project is located primarily outside of the MHPA, the access road to the project is within the MHPA.

3.3.2 City of San Diego Biology Guidelines

The City of San Diego Development Services Department established the Biology Guidelines (revised 2018) presented in the Land Development Manual "to aid in the implementation and interpretation of the Environmentally Sensitive Lands Regulations (ESL), San Diego Land Development Code (LDC), Chapter 14, Division 1, Section 143.0101 et seq., and the Open Space Residential (OR-1-2) Zone, Chapter 13, Division 2, Section 131.0201 et seq." (City of San Diego 2018). The guidelines also provide standards for the determination of impact and mitigation under the California Environmental Quality Act and the California Coastal Act. Sensitive biological resources, as defined by the Environmentally Sensitive Lands Regulations, include lands within the MHPA, as well as other lands outside of the MHPA that contain wetlands; vegetation communities classifiable as Tier I, II, IIIA, or IIIB; habitat for rare, endangered, or threatened species; or narrow endemic species.

The City's definition of wetlands is broader than the definition applied by the U.S. Army Corps of Engineers (ACOE). The City uses the criteria listed in Section 320.4(b)(2) of the ACOE General Regulatory Policies (33 CFR 320–330) to apply an appropriate buffer around wetlands that serves to protect the function and value of the wetland. Guidelines that supplement the development regulation requirements described in this section are provided in the San Diego Municipal Code, Land Development Code—Biology Guidelines (City of San Diego 2017).

The Project would be considered an Essential Public Project in that it would service the community at large and not just a single development project or property. Examples of Essential Public Projects include identified circulation element roads, major water and sewer lines, publicly owned schools, parks, libraries, and police and fire facilities.

3.3.3 City of San Diego Vernal Pool Habitat Conservation Plan

The City's Habitat Conservation Plan was developed to provide a framework for protection, restoration and management of vernal pool resources within the City's MSCP subarea, while streamlining the permitting process for threatened and endangered species associated with vernal pools. The VPHCP also expanded the area of the MHPA to conserve additional lands that include vernal pool resources.

Specifically, the City, in collaboration with the Wildlife Agencies, developed a conservation strategy to ensure compliance with Federal Endangered Species Act, the City's existing NCCP authorizations, and other applicable environmental regulations. This strategy requires higher levels of management and monitoring for vernal pool resources identified as having long-term value while lower levels of management and monitoring were to be provided for vernal pool resources with relatively low long-term value.

The purpose of the Final City of San Diego VPHCP is to: (1) preserve a network of vernal pool habitat in a matrix of open space; (2) protect the biodiversity of these unique wetlands; and (3) define a formal strategy for their long-term conservation, management, and monitoring (City of San Diego 2017). The Final VPHCP considers a seasonally flooded depression to be a vernal pool if it includes one or more indicator species (City of San Diego 2017) listed in Appendix A of the Final VPHCP (City of San Diego 2017). The Final VPHCP encompasses 206,124 acres within the MSCP Subregional Plan area in the southwestern portion of San Diego County (City of San Diego 2017).

During the implementation of the VPHCP, changes may arise due to new information, requests from private or public development seeking entitlements, or other modifications that are unforeseen. Changes that relate to mapping corrections, boundary line adjustments, or airport actions under the circumstances identified in Section 8.4.1 (mapping corrections), Section 8.4.2 (boundary line adjustments), or 8.4.3 (minor amendments) do not require a major amendment.

The Minor Amendment Process has been identified for two airports: Montgomery-Gibbs Executive Airport and Brown Field Airport. The Minor Amendment Process would allow impacts to vernal pool habitat and VPHCP covered species located within the legal boundaries of the airport properties while meeting health and safety requirements of the airports.

Approval of a Minor Amendment requires a project submittal by the Permittee (Real Estate Assets, Airports Division) to Wildlife Agencies (USFWS Field Office Supervisor and CDFW's NCCP Program Manager) for a consistency determination with the VPHCP. The consistency determination would be based on the VPHCP; the VPMMP; funding for the required management, monitoring, and reporting activities; and the City's ESL and Biology Guidelines. If a project is consistent with the VPHCP, the Wildlife Agencies will provide a Letter of Concurrence and the project will proceed in accordance with the VPHCP.Five plant and two crustacean species covered by the Final VPHCP include:

- Otay Mesa mint (Pogogyne nudiuscula)
- San Diego mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- San Diego fairy shrimp

4 METHODS AND SURVEY LIMITATIONS

Surveys for the Project were performed by qualified City biologists including Douglas Allen, Rebecca Alvidrez, Cindy Dunn, Maya Mazon, and Sean Paver and by consultants including Busby Biological and Recon Environmental. Surveys for the project encompassed a 11.7 acre survey area, which included the 3.7 acre project area and a 100-foot survey limit around the project footprint, referred to hereafter as the "survey area" A number of surveys were performed and included a biological reconnaissance survey, a general habitat assessment with vegetation mapping, a focused plant survey, protocol fairy shrimp surveys, vernal pool assessment, hydrology assessment, a focused burrowing owl habitat assessment, protocol California gnatcatcher surveys, and a jurisdictional delineation (Table 1). Surveys were completed during the day; therefore, nocturnal species may not have been observed. Biologist conducted biological surveys within the proposed project footprint and in order to assess the surrounding areas a 100-foot and 500 foot-survey limit around the project footprint were also surveyed for botanical, and burrowing owl habitat, respectively. The methods for each of these field surveys are described below.

Table 1: Survey Dates, Times, Weather Data, and Biologists Present

Survey Type	Date of Survey	Weather Conditions	Biologists Present
Focused Burrowing Owl Habitat Assessment	May 13, 2016	61°F, wind speed 5-10mph, 40% cloud cover, no precipitation	Busby Biological (Darin Busby and Erik LaCoste)
	April 14, 2020	57°F, wind speed 0-10mph, 40% cloud cover, no precipitation	Sean Paver
Vernal Pool Assessment	January 10, 2018	62°F, wind speed 4-10mph, 40% cloud cover, no precipitation	Cindy Dunn and Sean Paver
Biological Reconnaissance Survey	January 17, 2018	72°F, wind speed 1-4 mph, 10% cloud cover, no precipitation	Cindy Dunn, Sean Paver and Rebecca Alvidrez
Hydrology Assessment	February 8, 2018	75°F, wind speed 4-12mph, 0% cloud cover, no precipitation	Cindy Dunn and Sean Paver
Focused Plant Survey	April 11, 2018	66°F, wind speed 5-9 mph, 5% cloud cover, no precipitation	Cindy Dunn, Rebecca Alvidrez, and Sean Paver
Focused Plant Survey	May 21, 2018	63°F, wind speed 6-10 mph, 80% cloud cover, no precipitation	Cindy Dunn, Rebecca Alvidrez and Maya Mazon
Jurisdictional Delineation and CRAM	June 25, 2018	70°F, wind speed 7-12mph, 0% cloud cover, no precipitation	Cindy Dunn, Maya Mazon, and Sean Paver
Jurisdictional Delineation	November, 1 2019	67°F, wind speed 0-10mph, 0% cloud cover	Andrew Smisek (RECON)
Focused Fairy Shrimp Survey*	January 10, 2018	62°F, wind speed 4-10mph, 40% cloud cover, no precipitation	Douglas Allen (TE-837448-7), Cindy Dunn and Sean Paver
	January 17, 2018	72°F, wind speed 1-4 mph, 10% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	January 24, 2018	73°F, wind speed 1-4mph, 10% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	February 28, 2018	60°F, wind speed 8-10 mph, 10% cloud cover, no precipitation	Douglas Allen and Cindy Dunn
	March 7, 2018	73°F, wind speed 6-9 mph, 40% cloud cover, no precipitation	Douglas Allen and Cindy Dunn
	March 12, 2018	64°F, wind speed 11-15mph, 15% cloud cover, no precipitation	Douglas Allen and Cindy Dunn
	March 19, 2018	69°F, wind speed 11-15mph, 15% cloud cover, no precipitation	Douglas Allen and Cindy Dunn
	March 26, 2018	64°F, wind speed 13-15mph, 10% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	July 11, 2018	75°F, wind speed 5-10mph, 5% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	November 30, 2018	63°F, wind speed 5-10mph, 60% cloud cover, 0.01-inch of precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	December 7, 2018	67°F, wind speed 5-10mph, 5% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	December 11, 2018	61°F, wind speed 0-5mph, 5% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	December 14, 2018	68°F, wind speed 0-5mph, 85% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	January 14, 2019	59°F , wind speed 11-15mph ,100% cloud cover, light rain	Douglas Allen, and Sean Paver
	January 18, 2019	62°F, wind speed 5-10mph, 50% cloud cover, no precipitation	Sean Paver
	January 20, 2019	60°F, wind speed 5-10mph, 40% cloud cover, no precipitation	Douglas Allen, Cindy Dunn, and Sean Paver
	January 21, 2019	57°F, wind speed 11-15mph, 25% cloud cover, no precipitation	Douglas Allen, and Sean Paver
	February 5, 2019	57°F, wind speed 11-15mph, 100% cloud cover, no precipitation	Sean Paver
	February 12, 2019	59°F, wind speed 0-5mph, 40% cloud cover, no precipitation	Sean Paver
	February 19, 2019	59°F, wind speed 5-10mph, 0% cloud cover, no precipitation	Sean Paver
	February 26, 2019	46°F, wind speed 5-10mph, 40% cloud cover, no precipitation	Sean Paver
	March 5, 2019	61°F, wind speed 5-10mph, 0% cloud cover, no precipitation	Sean Paver

	March 12, 2019	50°F, wind speed 5-10mph, 50% cloud cover, no precipitation	Sean Paver
	March 20, 2019	64°F, wind speed 10-20mph, 75% cloud cover	Sean Paver
	March 29, 2019	67°F, wind speed 0-10mph, 0% cloud cover	Sean Paver
Protocol California Gnatcatcher Survey	April 1, 2020	55°F, wind speed 0-5mph, 100% cloud cover, no precipitation	Cindy Dunn and Sean Paver
	April 14, 2020	57°F, wind speed 0-10mph, 40% cloud cover, no precipitation	Cindy Dunn and Sean Paver
	April 21, 2020	57°F, wind speed 0-10mph, 60% cloud cover, no precipitation	Cindy Dunn and Sean Paver

*Multiple visits were made to perform protocol fairy shrimp surveys, please refer to the fairy shrimp survey report for additional details.

4.1 Biological Reconnaissance Survey, Vegetation Mapping, and General Habitat Assessment

A desktop survey was completed to determine potential for sensitive plant and wildlife by using the following databases: online aerial satellite imagery (SANDAG 2017; Google 2016), City Multiple Species Conservation Program (MSCP) Subarea Plan (City 1997), U.S. Fish and Wildlife (USFWS) species occurrence data (USFWS 2016a) and critical habitat portal (USFWS 2016b), SanBIOS database (County of San Diego 2016), California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CNDDB; CDFW 2016a), *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2016b), California Native Plant Society (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2016), the Jepson *On-Line Interchange for California Floristics* (UC Berkeley 2016) and *Special Animals List* (CDFW 2016c).

City biologists conducted a biological reconnaissance survey and vegetation mapping to document the existing biological resources within the project footprint. In addition, 100-foot survey limit was surveyed for potential to support sensitive plant species and a 500-foot survey limit for its potential to support sensitive wildlife species. City biologists recorded all plant and wildlife species observed directly and/or detected indirectly through sign (e.g., scat, tracks, burrows, vocalization) within the survey areas. City biologists conducted the biological reconnaissance survey on foot, mapping vegetation communities and land cover types by hand onto aerial imagery with a 1 inch equals 80 feet scale and noting dominant plant species within these vegetation communities. Digital photographs of representative areas were taken during the reconnaissance survey. The hand-drawn vegetation community and land cover type boundaries were digitized in the office using GIS software (Figure 3). Vegetation community classifications follow Holland (1986) as modified by Oberbauer et al. (2008). Wildlife and plant species lists were created using the nomenclature of Laudenslayer (1991) and Simpson and Rebman (2015), respectively.

4.2 FOCUSED PLANT SURVEY

A desktop survey was completed to determine potential for sensitive plant species to occur within the project footprint and associated 100-foot survey limit by using the City's Multiple Species Conservation Program (MSCP) Subarea Plan (City 1997), U.S. Fish and Wildlife (USFWS) species occurrence data (USFWS 2016a) and critical habitat portal (USFWS 2016b), SanBIOS database(County of San Diego 2016) and California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CNDDB; CDFW 2016a). Focused plant surveys were conducted following the California Native Plant Society's Botanical survey Guidelines (2018) with plant names following Simpson and Rebman (2015). The California Native Plant Society (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2016), and the Jepson *On-Line Interchange for California Floristics* (UC Berkeley 2016) were used in order to determine appropriate survey dates along with local precipitation data and regional botanical knowledge. Location information was recorded using Collector for ArcGIS on an EOS Arrow Lite GPS receiver.

4.3 FOCUSED BURROWING OWL HABITAT ASSESSMENT

A focused burrowing owl habitat assessment was performed by Busby Biological Services in 2016 (Busby 2016) and can be found in Appendix G. An updated assessment was performed by Biologist Sean Paver April 2020 and confirmed the conditions documented by Busby in 2016 remained the same. The Burrowing Owl Habitat Assessment included the Proposed Project impact area and a 500-foot survey limit, to identify locations of suitable habitat for the species. The habitat assessment consisted of an analysis of species occurrence data, desktop evaluation of available site data and aerial imagery, and a field evaluation to further investigate and map suitable burrowing owl habitat. Busby obtained prior burrowing owl occurrence data for the Burrowing Owl Habitat Assessment Area and an approximately 3-mile buffer from the CDFW *California Natural Diversity Database* (CDFW 2016a). Other special-status species resources were reviewed, including the Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007); San Diego County Breeding Bird Atlas (Unitt 2004); North American Breeding Bird Survey, Results Analysis 1966-2012 (Sauer et al. 2014); the San Diego Natural History Museum Bird Atlas Project (SDNHM 2016); and other regional and site-specific relevant information, data, and literature. Busby evaluated aerial imagery of the Burrowing Owl Habitat Assessment Area to determine presence of suitable habitat such as patches of open or other potentially suitable burrowing owl breeding and/or foraging habitat. Potentially suitable habitat was later evaluated during the focused field evaluation and unsuitable habitat was excluded. Busby used the results of the background research and desktop evaluation as guidance during the field evaluation conducted within the Burrowing Owl Habitat Assessment Area. All habitat within the Burrowing Owl Habitat Assessment Area was visited to determine the potential to support breeding and/or foraging burrowing owl. Representative photographs were taken of the Burrowing Owl Habitat Assessment Area. The following criteria categories were used to evaluate the suitability of the Burrowing Owl Habitat Assessment Area:

- Dominant vegetation and land use
- Presence of adjacent foraging habitat
- Vegetation height and shrub density
- Presence or absence of friable soils
- Presence and quantity of burrows and burrow complexes
- Other evidence of fossorial animal use and burrow features
- Topography and hydrological features

This data was used to assess the overall potential for the Burrowing Owl Habitat Assessment Area to support burrowing owl, taking into consideration the species occurrence data and the evaluation criteria. Habitat within the Burrowing Owl Habitat Assessment Area was either classified as not expected to support burrowing owl or as having a low, moderate, or high potential to support burrowing owl.

4.4 PROTOCOL-LEVEL SURVEY FOR SAN DIEGO FAIRY SHRIMP

Vernal pools have been previously identified on MYF and areas adjacent to the project footprint. Historical occurrences of San Diego Fairy Shrimp have been recorded in these pools. Protocol fairy shrimp surveys were conducted to determine the presence/absence of this species within and adjacent to the project footprint. Precipitation events were monitored from January 2017 until the vernal pools dried out in late March 2018 and again in November 2018 through March 2019, so that the status of the vernal pools and fairy shrimp could be recorded. Protocol-level focused surveys for the federal-listed San Diego Fairy Shrimp were conducted once appropriate conditions were established. Previous biological survey results from Recon Environmental, Inc. (2016, Recon), who surveyed the majority of the impact area have been incorporated herein where applicable, i.e., where resources occurred within 100-feet of the project impact area.

4.5 JURISDICTIONAL DELINEATION OF WETLANDS AND WATERS

A desktop survey for jurisdictional wetlands and waters was conducted using the following databases: online aerial satellite imagery (Google 2016), SanBIOS database (County of San Diego 2016), USGS topographic maps (USGS 1996) and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps (USDA

2016), and USFWS National Wetlands Inventory (USFWS 2018).

A focused jurisdictional delineation and mapping was conducted on foot within the biological survey area (BSA) on June 25, 2018 and again in November 2019, to determine if there are resources found to be potentially jurisdictional by USACE pursuant to Section 404 of the CWA, RWQCB pursuant to Section 401 of the CWA and State Porter-Cologne Water Quality Control Act, CDFW pursuant to CFGC Section 1600, and/or the City pursuant to the City Biology Guidelines and the San Diego Municipal Code. The assessment was conducted by walking meandering transects throughout the BSA and evaluating the existing topography and vegetation for potentially jurisdictional resources.

Potentially jurisdictional USACE and RWQCB resources were assessed by identifying the hydrologic, vegetative, and soil characteristics following the technical guidelines provided in the following manuals: USACE *Wetlands Delineation Manual* (USACE 1987), USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0; USACE 2008), and USACE *Updated Datasheet for the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2010). Potentially jurisdictional CDFW resources were assessed for the presence of a defined bed and bank and any associated riparian habitat pursuant to criteria outlined in CFGC Section 1600 *et. seq.* Finally, potentially jurisdictional City wetland resources were assessed for the dominance of hydrophytic plant species pursuant to the definition of wetlands as outlined in the City Biology Guidelines. A hand-held GPS device and an aerial imagery map with a 1 inch equals 175 feet scale were used to record the locations of photograph points, sample points, and potentially jurisdictional resources.

4.5.1 Vernal Pools

According to historical records and the City of San Diego's Vernal Pool Habitat Conservation Plan (VPHCP, 2017) the presence of vernal pools have been recorded adjacent to the project footprint. During the determination of jurisdictional resources within the project footprint and a 100-foot survey limit, surveys for vernal pool indicator species were conducted using the methods established in the City of San Diego's VPHCP 2017. The City requires the presence of at least one vernal pool indicator species to be considered a vernal pool. Precipitation events were closely followed at the documented adjacent vernal pools as a reference for appropriate survey periods for vernal pool species. Previously undocumented vernal pools were mapped using an EOS Aero Lite sub-meter GPS receiver and digitized using ESRI ArcGIS software (Figure 4).

5 SURVEY RESULTS

5.1 GENERAL PHYSICAL CHARACTERISTICS

MYF is located on Kearny Mesa and is relatively flat, with elevations ranging between 400 to 420-feet above mean sea level. MYF is developed with an airfield, associated buildings, and parking areas. Areas of undeveloped land occur between runways, in clearance zones and on the periphery of the airfield. The areas adjacent to the runways are routinely mowed in accordance with FAA requirements. Undeveloped areas within MYF are well known to support vernal pools, and pools have been well-documented on MYF (VCHCP, 2017). Within the Project footprint, undeveloped land located northeast and northwest of the existing facilities building are routinely mowed and were historically used for overflow parking and storage. Elevations within the Project footprint range from approximately 414 to 416-feet above mean sea level. Soils within MYF and the Project footprint are Redding gravelly loam (USDA 2020).

5.2 BOTANICAL RESOURCES

This section describes vegetation observed within the survey area. The vegetation within the Project footprint is primarily disturbed and developed but supports some areas of San Diego mesa hardpan vernal pools. Table 2 breaks down the vegetation community within the Project footprint and the survey area by acreage. The survey area adjacent to the Project footprint is composed of non-native grassland, developed, disturbed habitat, Diegan coastal sage scrub and San Diego mesa hardpan vernal pools (Figure 3). A breakdown of species observed within each vegetation community can be found in Appendix B. Six vernal pools are located within the Project footprint.

5.2.1 Non-Native Grassland (Tier IIIB)

Non-native grassland is an herbaceous vegetation type that is typically dominated by *Bromus*, *Fescue*, *Avena* and *Lolium* species with other non-native herbs being co-dominant to subdominant. Soils are often clay based but occupy areas with drier site conditions and poorer soils. Trees and shrubs may be present in trace amounts. Within the survey area non-native grassland is located within the 100-foot survey limit north of the project footprint and east of the airport road. The dominant grasses in the Project footprint were red brome (*Bromus madritensis* ssp. *rubens*) with wild oat (*Avena barbata)* occurring to a lesser extent.

5.2.2 Disturbed Habitat (Tier IV)

Disturbed Habitat areas typically have heavily compacted soils following intense levels of disturbance such as grading or agriculture. These areas may contain sparse remnants of native vegetation but are dominated by at least 50% cover of invasive broad-leaved non-native plant species. The disturbed habitat onsite is located within the project footprint and extends into the 100-foot survey limit. The area within the Project footprint is regularly mowed and was historically used for overflow parking. The disturbed habitat is dominated by red-stemmed filaree (*Erodium cicutarium*), cheeseweed (*Malva parviflora*), and red brome.

5.2.3 Developed (Tier IV)

Developed areas have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is characterized by permanent or semi-permanent structures, pavement or hardscape, and landscaped areas that often require irrigation. Areas where no natural land is evident due to a large amount of debris or other materials being placed upon it may also be considered Urban/Developed (e.g., car recycling plant, quarry). The developed areas are within the Project footprint and extend outward into the 100-foot survey limit. Developed areas within the project footprint include a facilities building, access road, and parking lot.

5.2.4 San Diego Mesa Hardpan Vernal Pools (Wetland)

San Diego Mesa Hardpan Vernal Pools areas are shallow, ovoid clay hardpan lenses interspersed within flat areas or Mima mounds. Vernal pools have seasonally hydrologic conditions and retain water for about two weeks. During these times of inundation a plethora of existing, dormant flora and fauna reanimates. Locally, vernal pools range from three to 20 meters in diameter in length and 0.4 to 1.2 meters in height (Zedler et al, 1979). Hardpan vernal pools are typically surrounded by grassland on marine terraces with fine textured, grey soil. Vernal pools can also be identified by 'indicator' plant species that are restricted to the habitat. Six vernal pools are located within the Project footprint.. The vernal pools within the project footprint are located in disturbed habitat and contained the following vernal pool indicator species: wooly marble (*Psilocarphus brevissimus*) and/or prairie plantain (*Plantago elongata*) and San Diego fairy shrimp. Additional vernal pools were also observed within the survey area, outside the project footprint, east of the airport road; these vernal pools were documented by the City of San Diego in 2003. These vernal pools are located in a non-native grassland and contained the following vernal pool indicator species: San Diego mesa mint (*Popogyne abramsii*), cupidate downingia (*Downingia cuspidata*), and San Diego fairy shrimp.

5.2.5 Diegan Coastal Sage Scrub (Tier II)

Diegan Coastal Sage Scrub are found in areas with low moisture and low growing, soft-woody subshrub no taller than 1 meter in height. The area may have steep xeric slopes or contain clay-rich soils that slowly release water. Flora is most active during the winter and early spring as they are typically facultative drought-deciduous. Diegan coastal sage scrub located within the survey area exists outside of the project footprint east of the airport tower road, and contains the following indicator species: California buckwheat (*Eriogonum fasciculatum*), coyote bush

(*Baccharis pilularis*), laurel sumac (*Malosma laurina*).

Table 2: Vegetation Communities Observed within the Survey Area		
Vegetation Type	**Tier**	**Area (acres)**
Diegan Coastal Sage Scrub	Tier II	2.999
Non-Native Grasslands	Tier IIIB	0.762
Developed	Tier IV	3.704
Disturbed	Tier IV	3.910
San Diego Mesa Hardpan Vernal Pool	Wetland	0.553
Total		**11.694**

5.3 Wildlife Resources

Animal observance on-site was low due to the developed nature of the area, and airport activity. Bird species noted in the Survey area included Mourning Dove (*Zenaida macroura*), Northern Mockingbird (*Mimus polyglottos*), California Towhee (*Melozone crissalis*), house finch (*Haemorhous mexicanus*), Red-tailed Hawk (*Buteo jamaicensis*), Common Raven (*Corvus corax*), and California gnatcatcher. A list of all species observed can be found in Appendix B.

5.4 Rare, Threatened, Endangered, Endemic and/or Sensitive Species or MSCP-Covered Species

Three sensitive plant species were observed within the Project footprint, Ashy spike-moss, Orcutt's brodiaea, and graceful tarplant. In addition to the three plant species, San Diego fairy shrimp were also detected within the Project footprint. A California gnatcatcher was observed foraging in habitat adjacent to the project footprint and San Diego mesa mint was observed within the 100-foot survey limit. A burrowing owl was incidentally observed on the edge of the airport, well outside the project footprint.

5.4.1 Ashy spike-moss

This is a California Rare Plant Rank 4.1 plant, meaning that it is defined as 'seriously threatened in California' (California Native Plant Society, 2001). This spike-moss occurs in chaparral and coastal scrub in sunny spots or under shrubs. It is commonly found at elevations less than 550 meters. This species was observed within the Project footprint within disturbed habitat at the northern half of the site. A map showing the distribution and quantities of the species within the survey area can be found in Figure 5.

5.4.2 Orcutt's brodiaea

This is a California Rare Plant Rank 1B.1 plant, meaning that it is defined as 'rare or endangered in California and elsewhere' and 'seriously endangered in California' (California Native Plant Society, 2001) and is also a MSCP-covered species. This Brodiaea family species occurs within mesic, clay soils in a variety of vegetation communities including closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grasslands and vernal pools below 1600 meters (California Native Plant Society, 2001 and Keck, 2012a). This species was observed within the Project footprint and 100-foot survey limit in disturbed habitat and San Diego Mesa Hardpan Vernal Pools. A map showing the distribution and quantities of the species within the survey area can be found in Figure 5.

5.4.3 Graceful tarplant

This is a California Rare Plant Rank 4.2 plant, meaning that it is defined by CNPS as 'limited distribution in California' and 'fairly endangered in California' (California Native Plant Society, 2001). This Sunflower family species occurs within chaparral, cismontane woodland, coastal scrub and valley and foothill grasslands below 900 meters (California Native Plant Society, 2001 and Keck, 2018b). This species was observed within the Project footprint and 100-foot survey limit in disturbed habitat and San Diego Mesa Hardpan Vernal Pools. A map showing the distribution and quantities of the species within the survey area can be found in Figure 5.

5.4.4 San Diego mesa mint

This is a Federally- and State-endangered, California Rare Plant Rank 1B.1 (California Native Plant Society, 2001), VPHCP-covered and narrow endemic species. This Mint family species occurs in vernal pools that occur at elevations between 100-200 meters. This species was observed within the 100-foot survey limit in San Diego Mesa Hardpan Vernal Pools. A map showing the distribution and quantities of this species within the 100-foot survey limit can be found in Figure 5.

5.4.5 San Diego fairy shrimp

This species was listed as endangered by the USFWS on February 3, 1997 and is a Vernal Pool Habitat Conservation Plan- covered species. A member of the family Brachinectidae and order Anostraca, immature fairy shrimp exist in the soil of vernal pools and other non-vegetated ephemeral pools (2-12 inches in depth) in a dormant state known as a cyst until the pool is inundated with seasonal precipitation. The juvenile fairy shrimp reach maturity within 7-14 days of rainfall filling the pool and measure approximately 16mm in length with 11 pairs of legs. After mating, the eggs are laid and remain as a cyst in the soil until the next inundation (Eriksen and Belk, 1999). Development of the species is closely tied to water temperature and chemistry along with a host of other environmental cues. Seasonal rainfall between January and March typically trigger fairy shrimp (Simovich and Hathaway 1996). This species has been previously documented on MYF in vernal pools and road ruts near the project area *(*Recon Environmental Inc*,* 2008*).* This species was observed within the 100-foot survey limit and within five vernal pools within the Project footprint (VP 4, VP 6, VP 7, VP 9, VP 14) in San Diego Mesa Hardpan Vernal Pools. Critical habitat for this species occurs within the survey area, but outside of the project footprint. A map showing the distribution of this species within the survey area can be found in Figure 4 and 5 and quantities observed are documented in Appendix C.

5.4.6 Burrowing owl

This species was designated a Species of Special Concern by the California Department of Fish and Wildlife and is a MSCP-covered species. A member of the family Strigidae this species is small with long legs and prefers open, flat, sparsely vegetated expanses with well-drained soils as they are ground dwelling. Burrowing owls naturally occur in grasslands, shrub steppe and desert landscapes; however, they also inhabit agricultural areas, ruderal grassy fields, vacant lots and pastures. They inhabit burrows excavated by other species, natural rock cavities, debris piles, culverts and pipes (Gervais et al 2008). Burrowing owls are sustained on a diet of arthropods, small rodents, birds, amphibians, reptiles and carrion (Haug et al, 1993). Breeding season for this species is generally February 1 through August 31 although nesting has been observed as early as December and a peak in active nests between April 15 and July 15 (Thomsen 1971 and Gervais et al 2008). The species has been previously observed on MYF, as recently as April 2018. The historical occurrences are limited to the southwest and southeast corners of MYF, with the closest known occurrence being more than 1800-feet from the project footprint. Suitable foraging habitat exists for the Burrowing Owl within and adjacent to the project area, flat, low growing vegetation, mowed regularly. No burrowing owls or active burrows have been observed within or near the project footprint. No potential burrows or ground squirrels have been observed within the survey area.

5.4.7 California coastal gnatcatcher

This species was Federally-listed as Threatened on March 25, 1993, is designated as a Species of Special Concern by the California Department of Fish and Wildlife, and is a MSCP-covered species. A member of the Sylviidae family this songbird is small (~4.5 inches) with a blue-grey back and a greyish white underside. The tail feathers are long and black with characteristic white outer tail feathers. This species is strongly associated with sage scrub but also inhabits chaparral, grassland and riparian areas adjacent or intermixed with sage scrub. Breeding typically occurs between March 1 and August 15 with a peak in active nests between mid-March through mid-May. California gnatcatchers are known to occur on MYF, and are typically found in the south – southeastern area of the airport. During a site visit (2019), one was briefly observed approximately 100-feet east of the project footprint, foraging within the California buckwheat. Another was detected during protocol surveys (April 2020) approximately 350-feet southeast of the project footprint. A map showing the distribution of this species within the survey area can be found in Figure 5 and quantities observed are documented in Appendix C.

The table in Appendix C summarizes the potential for other sensitive species occurrence on site that were not detected during surveys. “Sensitive” meaning species that are Federally- or State-listed, CDFW Species of Special Concern (SSC), California Native Plant Society’s California Rare Plant Rating (CRPR), Multiple Species Conservation Plan-covered, and Narrow Endemic Species (City of San Diego 1997). The table was created using information from CNDDB records.

5.5 JURISDICTIONAL DELINEATION OF WETLANDS AND WATERS

Six depressional features that meet the City’s definition of a vernal pool wetland were found within the project footprint. These features were determined to be potentially wetland waters of the U.S. under the federal jurisdiction of the USACE. Under the Porter-Cologne Water Quality Control Act, these features may also be potential waters of the state, which are under the jurisdiction of the RWQCB. Consultation with state and federal permitting agencies will be required prior to project implementation. Impacts associated with the project are provided in Table 3, below.

Table 3. Jurisdictional Features

Habitat	Feature	Identification	Jurisdiction	Occupancy	Acreage
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #4	City/RWQCB/ USACE	San Diego Fairy Shrimp	0.032
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #6	City/RWQCB/ USACE	San Diego Fairy Shrimp	0.013
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #7	City/RWQCB/ USACE	San Diego Fairy Shrimp	0.028
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #9	City/RWQCB/ USACE	San Diego Fairy Shrimp	0.003
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #14	City/RWQCB/ USACE	San Diego Fairy Shrimp	0.011
San Diego Mesa Hardpan Vernal Pool	Vernal Pool	FOVP #16	City/RWQCB/ USACE	Indicator Plants	0.002
				Total	**0.089**

*Values may vary slightly due to rounding errors.

5.5.1 Functional Assessment

A qualitative assessment of the vernal pools was performed using the California Rapid Assessment Method (CRAM). The assessment was performed using the guidelines of the Vernal Pool Module for Individual Pools. The individual module was selected because of the lack of connectivity each of the pools had with other pools or systems. Because of the similarity in conditions and location, the four largest pools were assessed. The scores for the four pools were relatively low. This was to be expected as all pools are located in the same general area, are subject to the same disturbances, and lacked the typical qualities associated with high quality vernal pools. See Table 4 for a summary of the scores and Appendix D for the detailed report.

Table 4. Vernal Pool CRAM Scores

Components of CRAM	Vernal Pool 4	Vernal Pool 6	Vernal Pool 7	Vernal Pool 9
Attribute 1: Buffer and Landscape Context	65	68	83	79
Attribute 2: Hydrology	58	58	75	67
Attribute 3: Physical Structure	25	25	25	25
Attribute 4: Biotic Structure	33	29	38	33
Overall AA Score	**45**	**45**	**55**	**51**

6 PROJECT IMPACT ANALYSIS

6.1 BIOLOGICAL IMPACTS

6.1.1 Direct Impacts

6.1.1.1 Vegetation Communities/Land Uses

The Fire-Rescue Air Operations Facility Project proposes the construction of permanent helicopter hangars with a surrounding apron, a fueling station, and parking. Construction is anticipated to result in direct impacts on 3.719 acres of land (includes 0.7 acre for access road/staging), of which 0.089 acre are vernal pool wetland habitat and 3.63 acres are developed/disturbed habitat (Figure 3). Impacts to 0.089 acre of vernal pool habitat are considered significant and require mitigation.

Table 5. Direct Impacts to Vegetation Communities

Vegetation Type	Direct Impacts (acres)*
Developed (Tier IV)	1.747
Disturbed (Tier IV)	1.883
San Diego Fairy Shrimp Occupied Vernal Pool	0.087
Indicator Species Occupied Vernal Pool	0.002
Subtotal	0.089
Total	**3.719**

6.1.1.2 Critical Habitat

Critical habitat for spreading navarretia overlaps with the project footprint and is anticipated to be directly impacted. Approximately 1.014 acres (0.039 acres of San Diego Mesa Hardpan Vernal Pool, 0.637 acres of disturbed habitat, and 0.338 acre of existing road) of spreading navarretia critical habitat will be impacted by project construction. San Diego fairy shrimp critical habitat is located adjacent to the project footprint and will not be impacted. Impacts to critical habitat are covered under the VPHCP and are discussed in section 6.5.

6.1.1.3 Sensitive Species

Ashy spike-moss, Orcutt's brodiaea, graceful tarplant, and San Diego fairy shrimp were documented within the project footprint. These individuals would be directly impacted with the implementation of this project. California gnatcatcher, burrowing owl, and San Diego mesa mint were documented outside the project footprint, and will not be directly impacted by this project.

6.1.1.3.1 Ashy spike-moss

Ashy spike-moss was detected within the project footprint and approximately 6 individuals will be impacted by this project. This species is a California Rare Plant Rank (CRPR) 4.1 species. CNPS List 4 is a watch list for species that have a limited distribution. This species is still relatively common in San Diego County. Species on CNPS lists 1 or 2 must be considered in Project CEQA analysis; lists 3 and 4 have no such mandates, but CNPS recommends that they be disclosed. Ashy spike-moss is not an MSCP covered species; the primary targets of the MSCP were high sensitivity plants and animals, most with listing under state and federal endangered species acts. However, as a regional conservation program the MSCP also protects 'non-covered' species such as ashy spike-moss through habitat acquisition and preservation efforts. Pursuant to the City's Biology Guidelines, "In general, it is accepted that securing comparable habitat at the required ratio will mitigate for the direct impact to most sensitive species. Species specific analysis for sensitive species not covered by the MSCP may be required as part of the CEQA process. It is expected that the majority of CEQA sensitive species not covered by the MSCP will be adequately mitigated through the habitat based mitigation described in Section III of these Guidelines." Because ashy spike-moss occurs throughout San Diego and is being conserved through the MSCP program, Project impacts on this species would not be significant.

6.1.1.3.2 Orcutt's brodiaea

Orcutt's brodiaea was detected within the project footprint and approximately 133 individuals will be impacted by this project. This is a California Rare Plant Rank 1B.1 plant, meaning that it is defined as 'rare or endangered in California and elsewhere' and 'seriously endangered in California' (California Native Plant Society, 2001) and is also a MSCP-covered species. This species is only known to occur in limited distribution within San Diego County, but is fairly prevalent within the undeveloped areas of the survey area. A map showing the distribution and quantities of the species within the survey area can be found in Figure 5. This project will impact approximately 132 individuals. This is an MSCP covered species and the MSCP conditions of coverage for this species require conservation of the 4 major populations and 100% conservation of the San Vincente population. There are no Area Specific Management Directives for MYF or Orcutt's brodiaea within the Urban subarea. The project footprint is not located within one of the four major populations for this species, and impacts to this species will occur outside the MHPA. Therefore this species will be adequately conserved through implementation of the MSCP program and impacts to this species would not be significant.

6.1.1.3.3 Graceful tarplant

Graceful tarplant was detected within the project footprint and approximately 38 individuals will be impacted. This species is a California Rare Plant Rank (CRPR) 4.2 species. CNPS List 4 is a watch list for species that have a limited distribution. This species is still relatively common in San Diego County. Species on CNPS lists 1 or 2 must be considered in Project CEQA analysis; lists 3 and 4 have no such mandates, but CNPS recommends that they be disclosed. Graceful tarplant is not an MSCP covered species; the primary targets of the MSCP were high sensitivity plants and animals, most with listing under state and federal endangered species acts.

However, as a regional conservation program the MSCP also protects 'non-covered' species such as graceful tarplant through habitat acquisition and preservation efforts. Pursuant to the City's Biology Guidelines, "In general, it is accepted that securing comparable habitat at the required ratio will mitigate for the direct impact to most sensitive species. Species specific analysis for sensitive species not covered by the MSCP may be required as part of the CEQA process. It is expected that the majority of CEQA sensitive species not covered by the MSCP will be adequately mitigated through the habitat based mitigation described in Section III of these Guidelines." Because graceful tarplant occurs throughout San Diego and is being conserved through the MSCP program, Project impacts on this species would not be significant.

6.1.1.3.4 San Diego fairy shrimp

This species is listed as endangered by the United States Fish and Wildlife Service and is a Vernal Pool Habitat Conservation Plan covered species. This species was documented on MYF in vernal pools within the project footprint and survey area. This species was observed within five vernal pools within the Project footprint (VP 7, VP 9, VP 11, VP 12, VP 14, and VP16) in San Diego Mesa Hardpan Vernal Pools. A map showing the distribution of this species within the project footprint and survey area can be found in Figure 4, and quantities observed are documented in Appendix C. This species is a VPHCP covered species, and impacts to this species are considered significant and will be mitigated in accordance with the VPHCP.

6.1.1.3.5 Burrowing owl

This species was designated a Species of Special Concern by the California Department of Fish and Wildlife and is a MSCP-covered species. The MSCP Subarea plan requires impacts to this species be avoided within the MHPA, and outside of the MHPA impacts to the species should be avoided to the maximum extent practicable. Suitable foraging habitat exists for the Burrowing Owl within and adjacent to the project footprint. No suitable burrows were detected within the project footprint. No burrowing owls were detected near the project footprint during survey/site visits for this project or during a focused habitat assessment performed by Busby in 2016 (Busby 2016). An incidental observation of burrowing owl did occur while driving to MYF; an owl was observed wintering along John J. Montgomery Drive, approximately 2500-feet from the project footprint. The owl was observed at this location multiple times from November 2017 to April 2018. This project will directly impact 1.833 acres of disturbed habitat that can be considered suitable foraging habitat for burrowing owl. Direct impacts to this species would be avoided.

6.1.2 Indirect Impacts

6.1.2.1 Sensitive Species

California gnatcatcher, San Diego fairy shrimp, and San Diego mesa mint were documented outside the project footprint, but within the survey area and have the potential to be indirectly impacted by this project.

6.1.2.1.1 California coastal gnatcatcher

This species is Federally-listed as Threatened, is designated as a Species of Special Concern by the California Department of Fish and Wildlife, and is a MSCP-covered species. California gnatcatchers are known to occur on MYF, and are typically found in the south – southeastern area of the airport. During a site visit in 2019, one was briefly observed approximately 100-feet east of the project area, foraging within the California buckwheat. During protocol surveys conducted April 2020 one was observed approximately 350-feet southeast of the project footprint. The project footprint does not contain appropriate nesting habitat and is composed of low quality foraging habitat. To comply with the MHPA Land Use Adjacency Guidelines and avoid indirect impacts to California gnatcatchers in the MHPA, Measures BIO-2 and BIO-4 will be implemented during construction. No significant impacts to California coastal gnatcatcher are anticipated as a result of this project.

6.1.2.1.2 San Diego fairy shrimp

Vernal pools occupied by San Diego fairy shrimp were observed within the survey area. Vernal pools located outside the project footprint have the potential to be indirectly impacted by runoff, erosion, dust, and other activities associated with the project. To comply with the MHPA Land Use Adjacency Guidelines and the VPHCP avoidance and minimization measures will be implemented in accordance with the VPHCP to prevent indirect impacts to vernal pools and San Diego fairy shrimp (Measure BIO-2).

6.1.2.1.3 San Diego mesa mint

This is a Federally- and State-endangered, California Rare Plant Rank 1B.1 (California Native Plant Society, 2001), MSCP-covered, VPHCP covered, and narrow endemic species. This species was observed within the 100-foot survey limit in San Diego Mesa Hardpan Vernal Pools. A map showing the distribution and quantities of this species within the survey area can be found in Figure 5. The MSCP conditions of coverage for this species require the Preserve management plan must include measures to: 1) protect against detrimental effects; 2) maintain surrounding habitat for pollinators; and 3) maintain pool watershed areas. This species will not be directly impacted by this project, but due to its proximity to the project footprint there is a potential for this species to be indirectly impacted. To ensure direct and indirect impacts to this species are avoided and to ensure compliance with the conditions of coverage and VPHCP, Measure BIO-2 will be implemented.

6.1.2.1.4 Burrowing Owl

The habitat within the survey area has the potential to provide suitable foraging habitat for burrowing owl. No potential or active burrows were detected during a focused habitat assessment performed by Busby in 2016 (Busby 2016) or in April 2020 by City biologist. Noise and other construction activities have the potential to indirectly impact burrowing owls that may be foraging in the area. To prevent and minimize indirect impacts to foraging burrowing owls during construction, Measure BIO-2 and BIO-5 will be implemented.

6.2 Wetlands and Jurisdictional Resources

Implementation of this project will impact six vernal pools, totaling 0.089 acre of impacts. No other wetlands or jurisdictional resources will be impacted by this project. These vernal pools are located outside of the MHPA, and impact of the vernal pools is consistent with the requirements of the VPHCP. Mitigation for impacts to 0.089 will occur in accordance with VPHCP and is described in section 6.5, therefore a wetland deviation is not required. The project is considered an Essential Public Project and therefore consistent with the requirements of the City's Biology Guidelines, VPHCP, and ESL Regulations. Consistency with these requirements is described in more detail below.

6.2.1 Wetland Buffers

The existing conditions within the survey area have approximately 24 vernal pools with watersheds that overlap existing development. The existing minimum buffer distance between vernal pool watersheds and development for these 24 vernal pools is 0-feet. The existing minimum buffer between development and vernal pool basins, ranges between 0-feet to 200-feet. A number of these vernal pools are likely the result of the adjacent developments and the runoff produced by the existing impervious surfaces.

Development of the helicopter facility will covert 6 vernal pools and undeveloped area into impervious surfaces. Development of the facility will occur within 20-feet of adjacent vernal pools not being directly impacted by this project. To determine what, if any, impacts would occur to the adjacent vernal pools, the watersheds of the pools were mapped using LIDAR data. A topographic map with 3-inch contour lines was created from the LIDAR data and used to determine the watersheds of vernal pools within and adjacent to the proposed helicopter facility (Figure 6). Due to the extremely flat terrain, some pools were grouped within a single watershed. Based on the results of the data, no watersheds would be directly impacted by the development of the helicopter facility. To prevent indirect impacts to the vernal pools and associated watersheds near the helicopter facility, the project has been designed to capture and retain all storm water flows onsite. Even though construction of the facility occurs within 20 feet of adjacent vernal pools, impacts to their watersheds has been avoided. Construction of the helicopter facility will not reduce the minimum buffer between the vernal pool watershed and development of any remaining vernal pools; all buffers between watersheds and development were 0-feet and will remain the same. The development of the helicopter facility will reduce the minimum buffer between the vernal pool basin and development to one vernal pool; the minimum buffer distance would be reduced from 22-feet to 20-feet.

The road that will be used for construction access and that will be repaired following construction of the facility, has a number of vernal pools directly adjacent (0 to 20-feet). The road will be patched and/or repaved following construction, but existing slopes and contours will be retained to prevent modification of the vernal pool watersheds that may overlap with the road.

The City's Biology Guidelines requires that a wetland buffer shall be maintained around all wetlands as appropriate to protect the functions and values of the wetland. Typically, wetlands have a very large watershed and impacts to the buffer of that wetland would directly impact the watershed. The wetlands located within and near the project footprint are vernal pools. Vernal pools typically have their own individual watershed and therefore it is necessary to ensure the watershed is protected in order to provide an adequate buffer. Impacts to the buffer/watershed could affect the functions and values of wetland. Functions and values of a wetland, as defined by the U.S. Army Corps of Engineers are:

- Biological Functions
    - Food chain production
    - Habitat and nesting
    - Spawning
- Hydrologic Functions
    - Natural Drainage
    - Sedimentation patterns
    - Salinity
    - Shielding from wave action or storm damage
- Water Quality Functions
    - Water storage
    - Ground water recharge
    - Water purification

Each of these functions for a vernal pool are affected by changes or impacts to the wetland and its watershed. As shown on Figure 7, Development of the helicopter facility will not impact the watersheds of any adjacent vernal pools. The helicopter facility is also designed to capture and retain all runoff onsite, thus preventing runoff that may affect the functions of adjacent vernal pools. The development of the helicopter facility will not change the existing hydrologic patterns of the adjacent vernal pools, therefore it will not affect the biological functions, hydrologic functions, or water quality functions of the vernal pools (wetlands).

As previously mentioned, vernal pools are located directly adjacent to the access road that will be used to construct the helicopter facility. Following completion of the helicopter facility, the access road would be repaired and/or repaved. There are no curbs or gutters along the access road, and the road's current design has a slight peak running down the middle of the road to allow water to drain off to either side. This means, the road is part of the watershed for the adjacent vernal pools. The road will maintain its existing slope and contours following repair, therefore maintaining the existing conditions, existing buffer, and existing hydrologic flow patterns. During repair of the road, work would occur within the paved road, parts of which act as the watershed for adjacent vernal pools. To prevent impacts to the functions and values of the vernal pools (wetlands) during construction, avoidance and minimization measures, as required by section 5.2.1 of the VPHCP, will be implemented. This will include the use of straw wattles, gravel bags, and/or silt fencing along the road.

This project will maintain and protect the existing watersheds of the existing vernal pools, therefore maintaining an adequate buffer to the wetlands (vernal pools) to preserve the existing functions and values provided by these wetlands.

6.3 MHPA Land Use Agency Guidelines

The project lies within the City's MSCP Subarea and primarily occurs adjacent to lands designated as MHPA under the MSCP (Figure 2). Projects occurring adjacent to the City's MHPA, must adhere to the City's MHPA land use adjacency guidelines as outlined in section 1.4.3 of the City's MSCP Subarea Plan. The guidelines and analyses of project conformance are as follows:

6.3.1 Drainage

All new and proposed development adjacent to the MHPA must not drain directly into the preserve, and must prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA.

The design of the project incorporates the use of retention basins and permanent storm water Best Management Practices (BMP) to capture and treat all storm water flows, up to a 100 year storm event, captured within the Project footprint. These project design features will prevent toxins and other materials from entering the MHPA and will result in an improvement over current conditions. The project will also comply with the City's Landscape Regulations to prevent exotic plant materials from entering the MHPA. The project would not result in a significant impacts to drainages.

6.3.2 Toxins

Land uses such as recreation and agriculture that use chemicals or generate byproducts that are potentially toxic or harmful to wildlife, habitat, or water quality must incorporate measures to reduce the impact of application or drainage of such materials into the MHPA.

The proposed project would not involve recreation or agriculture, and the project would not use chemicals or generate toxic or harmful byproducts. The proposed project would incorporate permanent storm water BMP's to prevent the drainage of toxins or harmful materials into the MHPA. There would not be a change to the baseline conditions and the project would not result in a significant impact due to toxins.

6.3.3 Lighting

Lighting must be directed away from the MHPA and, if necessary, adequately shielded to protect the MHPA and sensitive species from night lighting.

This project involves the construction of hangars and will include some exterior lighting. All lighting will be shielded and directed away from the MHPA. In addition, this project is located on an airport adjacent to the runway, the FAA has specific requirements regarding lighting which are more stringent than the adjacency requirements of the MHPA. As a result of these requirements, lighting from the project would not result in significant impacts.

6.3.4 Noise

Uses adjacent to the MHPA must be designed to minimize noise that might impact or interfere with wildlife utilization of the MHPA.

The proposed project is located on an airport adjacent to a runway. Ambient noise levels are much higher at the project site and within the adjacent MHPA than typically found elsewhere. The project will construct hangars and concrete pads for aircraft storage and maintenance. This land use is consistent with the existing use of the area and will not result in an increase of noise within the MHPA and will not interfere with the existing wildlife utilization of the MHPA. During construction, heavy equipment such as dozers, excavators, and loaders will be utilized. Construction noise is not expected to exceed the existing ambient noise levels on the airport, but to ensure noise impacts to sensitive/listed species is avoided, mitigation measures will be implemented during the breading season to avoid indirect impacts.

6.3.5 **Barriers to Incursion**

New development adjacent to the preserve may be required to provide barriers along MHPA boundaries to redirect public access to appropriate locations and reduce domestic animal predation in the preserve.
The project is located on an airport, which has restricted access and prevents access to the public. This project will not increase access to the MHPA, or the occurrence of domestic animals near the MHPA. To help prevent any accidental access to the MHPA during airport operation, a barrier will be installed along the project boundaries after completion of the project. This barrier would consist of 3 to 4-foot tall poles connected by rope or chain, and would be primarily designed to prevent vehicle entry into the MHPA. The barrier design will require approval by the FAA prior to installation. As a result of the restrictive access and the installation of the barrier, no impacts to the MHPA would occur as result of this project.

6.3.6 **Invasive Species**

No invasive plant species shall be introduced into areas adjacent to the MHPA.
The proposed project does not include the installation of any ornamental landscaping. Any areas where temporary impacts occur would be revegetated in accordance with the City's Landscape Standards, and would only include native species. Therefore, the project would not result in a significant impact due to invasive species.

6.3.7 **Brush Management**

New residential development located adjacent to and topographically above the MHPA must be set back from slope edges to incorporate Zone 1 brush management areas on the development pad and outside of the MHPA. Zone 2 may be located in the MHPA upon granting of an easement to the City (or other acceptable agency) except where narrow wildlife corridors require it to be located outside of the MHPA.
New residential development is not proposed with this project, and installation of the hangar and concrete pad does not require additional brush management.

6.3.8 **Grading/Land Development**

Manufactured slopes associated with project development must be included in the project footprint.
No manufactured slopes are associated with the proposed project.

6.4 MHPA – COMPATIBLE LAND USES

The access road leading from Ponderosa Ave to the project area crosses through the MHPA. This existing road will provide construction access to the project area. Following completion of construction, it may be necessary to repair the access road. Repair work would include filling in pot holes/cracks, grinding the damaged surface, and/or installing a 2-inch overlay. All work would be restricted to the existing road surface and the road would not be widen or expanded.

Roads are considered a compatible use of the MHPA if they comply with Section 1.4.2 of the City's MSCP Subarea Plan. The majority of the policies and guidelines described in Section 1.4.2 apply to new access roads in the MHPA. This project will use an existing road within the MHPA and only those policies and guidelines related to existing roads are discussed below.

- *Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitat unless determined to be unavoidable. All such activities must occur on existing agricultural lands or in other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, then restoration of, and/or mitigation for, the disturbed area after project completion will be required.*

  The access road is existing and will not be widened or extended. Avoidance and minimization measures, as required by section 5.2.1 of the VPHCP, will be implemented during construction to ensure impacts to adjacent vernal pools is avoided. No impacts to existing habitat will occur as a result of this project.

- *Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage.*

Environmental documents and mitigation monitoring and reporting programs covering such development must clearly specify how this will be achieved, and construction plans must contain all the pertinent information and be readily available to crews in the field. Training of construction crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.
The access road is located on the airport, which is surrounded by development; the project area is not located in a wildlife corridor.

A project biologist will be assigned to the project and will provide training to construction crews.

- *For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary as identified in the Framework Management Section 1.5 (MSCP Subarea Plan).*

  The existing road is the only road that provides access to the Fire-Rescue Air Operations Building and FAA Control Tower; the road is not underutilized or duplicative.

6.5 VPHCP CONSISTENCY ANALYSIS

The VPHCP identifies seven vernal pool associated species as covered species and allows for limited impacts to these species for VPHCP-covered projects and activities. In addition, the VPHCP mandates the conservation and management of the covered species and their habitats in perpetuity. The VPHCP's overall conservation strategy for the covered species is to allow impacts to degraded vernal pools with low long-term conservation value in exchange for restoration, enhancement, preservation, and long-term management and monitoring of vernal pools with long-term conservation value in the MHPA.

The biological goal of the VPHCP is to contribute to the recovery of the VPHCP covered species and ensure continued persistence of the covered vernal pool species population identified in the VPHCP and the City's existing Natural Community Conservation Plan (MSCP).

During development of the VPHCP, a Minor Amendment Process was developed for the two airports owned and operated by the City; Montgomery-Gibbs Executive Airport and Brown Field Airport. The Minor Amendment Process would allow for impacts to vernal pool and VPHCP covered species located within the legal boundaries of the airport properties while meeting health and safety requirement of the airports.

For the Minor Amendment, the VPHCP requires submittal of the project to USFWS and CDFW for review to determine if the project is consistent with the VPHCP. The consistency determination would be based on the VPHCP; the Vernal Pool Maintenance and Monitoring Program (VPMMP); MSCP; and the City's ESL and Biology Guidelines. Once it is determined the project is consistent with the VPHCP, the Wildlife Agencies will provide a Letter of Concurrence and the project will proceed in accordance with the VPHCP approval of a Minor Amendment.

Because this project is located on MYF, it must go through the minor amendment process identified in the VPHCP and described above. The City has initiated this process with the wildlife agencies, and the consistency analysis submitted to the agencies is included in Appendix E. Additionally, consistency with the VPHCP is discussed below.

The proposed project is considered an essential City project and will provide essential fire services for most of coastal San Diego County. These types of development projects are considered a covered project within the City's VPHCP The project is located outside of the MHPA, and will impact six vernal pools. These vernal pools were not previously identified and are not included in the baseline existing conditions analysis for the VPHCP and VPMMP, and were not included as part of the MYF (N 5-6) complex. The management goal for MYF complex is to maintain existing habitat conditions and existing focal species population status.

This project will result in impacts to San Diego fairy shrimp and spreading navarretia critical habitat, both covered by the VPHCP. The VPHCP allows the impact of heavily degraded pools, outside the MHPA, in exchange for the preservation and restoration of high quality pools in the MHPA. The VPHCP identifies a total of 55 acres of critical habitat in the MYF Subunit 3D, of which 14 acres are identified as being not conserved. This project will impact 0.676 acres of Critical Habitat, outside the MHPA, and identified as not being conserved. The VPHCP states: "Although some overall loss of Critical Habitat will occur for each of the three covered species (see Chapter 6), the additional lands to be added to the MHPA are of higher biological value and are arranged in a configuration that maintains long-term viability of the VPHCP covered species. Management, maintenance, enhancement, and/or restoration of conserved vernal pool complexes containing Critical Habitat, as described in the VPMMP (see Chapter 7 and Appendix D), would result in a net biological benefit for all three species and their Critical Habitats." Impacts to spreading navarretia critical habitat is consistent with the VPHCP and would be offset through the long-term implementation of the VPHCP.

The VPHCP Conservation Objectives for San Diego fairy shrimp (SDFS) states "Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP." The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by this covered species. Additionally, as more surveys are completed within the Complex under the VPMMP, additional occupied pools are expected to be identified.

This project proposes to restore and re-establish vernal pools within the South Otay 1-Acre Complex (J13N). This restoration work will address the Conservation/Restoration Objectives for the J13N Complex and Conservation/Restoration Objectives for spreading navarretia, San Diego button-celery, California Orcutt grass, and Riverside fairy shrimp. The restoration project will establish viable populations of these species and will offset the impacts to pools on MYF with the restoration and re-establishment of vernal pools with higher function and value. To ensure compliance and consistency with the VPHCP, Mitigation Measures BIO-1, BIO-2, and BIO-3 have been included. Inclusion of these mitigation measures will also ensure the project complies with Section 5.2.1 of the VPHCP (Avoidance and Minimization Measures; further discussion of consistency with this section is included below. In addition, the project has been designed to capture onsite storm water and ensure runoff does not drain into adjacent pools, in accordance with the requirements of the VPHCP.

The following table outlines the conservation objectives of the VPHCP and describes how the project is consistent with these objectives and will meet the goals of the VPHCP.

Table 6: VPHCP Conservation Objectives

Objectives	Conserve	Manage	Restore	Consistency
Vernal Pools Objectives (Habitat Based)	Conserve in perpetuity at least 2,409 vernal pools (totaling approximately 37.5 acres of basin surface area) at 68 vernal pool sites (within 53 vernal pool complexes) in the MHPA in a configuration that maintains long-term viability of the VPHCP covered species.	Manage in perpetuity 59 vernal pool sites within the MHPA through implementation of the VPHCP Vernal Pool Management and Monitoring Plan or Site-Specific Management Plans (that are consistent with the VPHCP goals and objectives).	Restore 19 vernal pool sites (within 12 complexes) to a "Level 1" (stewardship) management condition within the MHPA through implementation of the VPHCP Management and Monitoring Plan or Site-Specific Management Plans (that are consistent with the VPHCP goals and objectives).	This project proposes to impact six vernal pools (0.089 acre) outside of the MHPA and proposes to re-establish and restore vernal pools inside the MHPA at a 2:1 ratio in a configuration that maintains long-term viability of VPHCP covered species. The mitigation associated with this project will increase the number of pools and basin surface area of conserved vernal pools within the MHPA. The restoration project will restore the J13N complex from a Level 3 to a Level 1 management condition. The J13N complex will be managed in perpetuity in accordance with the VPMMP.

Table 6: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
Species-Specific Objectives	Conserve occupied complexes identified in Appendix A of the VPMMP to stabilize covered species' populations.	Manage specific sites identified in Appendix A of the VPMMP to maintain the covered species populations consistent with the VPMMP (Appendix D).	Restore specific complexes identified in Appendix A of the VPMMP to enhance covered species populations to ensure long-term viability.	This project will impact pools located within Montgomery Field Complex (N 5-6) and will impact pools occupied with SDFS. The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The VPHCP Conservation Objectives for SDFS states "Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP." The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by covered species. Additionally, as more surveys are completed within the Complex under the VPMMP, additional occupied pools are expected to be identified. This project proposes to restore and re-establish vernal pools within the Otay 1-Acre Complex (J13N). This restoration work will address the Conservation/Restoration Objectives for the J13N Complex and Conservation/Restoration Objectives for spreading navarretia, San Diego button-celery, California Orcutt grass, Otay mesa mint and Riverside fairy shrimp. The restoration project will establish viable populations of these species.
Otay Mesa Mint	Conserve 369 vernal pools occupied by Otay Mesa mint within four sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of Otay Mesa mint within the J13E, J13N, J16–18, J20–21, J27, and J28 complex series.	This project will not impact any vernal pools occupied by Otay Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will incorporate Otay Mesa Mint to establish a viable population at J13N.

Table 6: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
San Diego Mesa mint	Conserve 335 vernal pools occupied by San Diego mesa mint within 19 sites.	Manage 12 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	This project will not impact any vernal pools occupied by San Diego Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP.
Spreading navarretia	Conserve 94 vernal pools occupied by spreading navarretia within seven sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of spreading navarretia within J11E, J11W, J12, J13E, J13 N, J16–18, J20–21, J27, J28, and R1.	This project will not impact any vernal pools occupied by spreading navarretia, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration plan will restore and incorporate spreading navarretia to establish a viable population at J13N.
San Diego button-celery	Conserve 722 vernal pools occupied by San Diego button-celery within 24 sites.	Manage 22 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Establish a viable population of San Diego button-celery within J13E and J13N.	This project will not impact any vernal pools occupied by San Diego button-celery, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate San Diego button-celery to establish a viable population at J13N.
California Orcutt grass	Conserve 58 vernal pools occupied by California Orcutt grass within three sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of California Orcutt grass within J11E, J11W, J12, J13E, J14, J16-18, J20–21, J21, J27, and J28E.	This project will not impact any vernal pools occupied by California Orcutt grass, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate California Orcutt grass to establish a viable population.

Table 6: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
Riverside fairy shrimp	Conserve 131 vernal pools occupied by Riverside fairy shrimp within 7 sites.	Manage all conserved sites consistent with the VPMMP.	Establish viable populations of Riverside fairy shrimp within J11E, J11W, J12, J13E, J13N, J14, J16-18, J20–21, J21, J27, and J28E.	This project will not impact any vernal pools occupied by Riverside fairy shrimp, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration plan will incorporate Riverside fairy shrimp to establish a viable population.
San Diego fairy shrimp	Conserve 465 vernal pools occupied by San Diego fairy shrimp within 38 sites.	Manage 33 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	This project will impact pools occupied with SDFS. The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by SDFS. Additionally, as more surveys are completed within the Complex under the VPMMP, additional occupied pools are expected to be identified.

The VPHCP requires indirect impacts to conserved vernal pools to be minimized by requiring development projects adjacent to the Preserve or MHPA to comply with the Land Use Adjacency Guidelines and the Avoidance and Minimization Measures in Section 5.2.1 of the VPHCP. Compliance with the Land Use Adjacency Guidelines is addressed above in section 6.3 of this document. Compliance with the requirements of Section 5.2.1 of the VPHCP is discussed below:

The following avoidance and minimization measures are specific to the design of the project. The measures not discussed below are requirements specific to construction and are included as a requirement under Mitigation Measure BIO-3.

1. Any development adjacent to the MHPA shall be constructed to slope away from the extant pools to be avoided, to ensure that runoff from the project does not flow into the pools.

   The project has been designed to capture all runoff onsite and prevent any runoff from flowing into adjacent pools in the MHPA.

2. Covered projects shall require temporary fencing (with silt barriers) of the limits of project impacts (including construction staging areas and access routes) to prevent additional vernal pool impacts and prevent the spread of silt from the construction zone into adjacent vernal pools. Fencing shall be installed in a manner that does not impact habitats to be avoided. Final construction plans shall include photographs that show the fenced limits of impact and all areas of vernal pools to be impacted or avoided. If work inadvertently occurs beyond the fenced or demarcated limits of impact, all work shall

cease until the problem has been remedied to the satisfaction of the City. Temporary construction fencing shall be removed upon project completion.

The project will be required to install temporary fencing and this requirement has been included in the mitigation measures and is shown on the construction plans.

8. Permanent protective fencing along any interface with developed areas and/or use other measures approved by the City to deter human and pet entrance into on- or off-site habitat shall be installed. Fencing shall be shown on the development plans and should have no gates (accept to allow access for maintenance and monitoring of the biological conservation easement areas) and be designed to prevent intrusion by pets. Signage for the biological conservation easement area shall be posted and maintained at conspicuous locations. The requirement for fencing and/or other preventative measures shall be included in the project's mitigation program.

   The project is located within a secure facility and is not accessible by the public. Mitigation measures have been included that require the construction of a barrier along the project footprint to prevent unauthorized access into the MHPA and environmentally sensitive areas.

While this project will result in impacts to vernal pools and San Diego fairy shrimp, these impacts are consistent with the objectives of the VPHCP and will result in the restoration and conservation of vernal pools and habitat with higher biological value. This project is consistent with the overall goals and objectives of the VPHCP, MSCP, VPMMP, and City's Biological Guidelines and will result in the overall increase of vernal pool basin area and the establishment of VPHCP species as required by these documents.

6.6 Cumulative Impacts

Cumulative impacts include both the potential regional (long-term, additive) effects of a project and the ways a project, in combination with other Projects and conditions in a region, may affect an ecosystem or one of its components beyond the Project limits and on a regional scale. Because the Project would be consistent with the City of San Diego's MSCP and VPHCP and regional conservation plans, there would be no cumulatively significant biological impacts.

7 Mitigation and Monitoring

The following mitigation requirements are required in conformance with the City of San Diego's California Environmental Quality Act Significance Determination Thresholds, Biology Guidelines 2018, and Land Development Code. Conformance with these requirements also achieves project conformance with the City's VPHMP, state/federal biological regulations, and would reduce potential impacts from the Fire-Rescue Air Operations Facility Project to below the level of significance.

7.1 Habitat Mitigation

Pursuant to the City's Biology Guidelines (City of San Diego, 2018), project impacts to Tiers I-III habitats and wetlands are considered significant and mitigation shall be provided. Required mitigation ratios and acreages are outlined in Table 7. Impacts to lands designated as Tier IV, such as disturbed and developed habitat, are not significant and will not require mitigation.

BIO-1 Habitat Mitigation - Impacts to San Diego Mesa Hardpan vernal pool will be mitigated in accordance with the *Vernal Pool Mitigation Plan for La Media Road Widening & Fire Rescue Air Operations Phase II* (RECON 2020) and pursuant to the City's VPHCP and Biology Guidelines. The re-establishment and restoration of vernal pools, at the location known as the South Otay 1-acre parcels, will occur to satisfy the required mitigation requirements. The *Vernal Pool Mitigation Plan for La Media Road Widening & Fire Rescue Air Operations Phase II* (RECON 2020) has been prepared in accordance with requirements of the VPHCP and Biology Guidelines and is included as Appendix H. The mitigation plan includes the seeding of sites with inoculum from nearby vernal pools to help re-establish populations of button celery, spreading navarretia, California Orcutt grass, San Diego Fairy Shrimp, and Riverside Fairy Shrimp. Inoculum from the impacted pools at MYF will not be used at the Otay 1-acre parcels site.

Table 7. Required Mitigation for Impacts to Vegetation Communities

Vegetation Type	Direct Impacts (acres)*	Mitigation Ratio	Required Mitigation
Developed (Tier IV)	1.747	0:1	0
Disturbed (Tier IV)	1.883	0:1	0
San Diego Mesa Hardpan Vernal Pool (Wetland)	0.089	2:1	0.178
Total	**3.719**	**--**	**0.147**

*Values may vary slightly due to rounding errors.

7.2 Biological Resource Protection Measures

Implementation of Measures **BIO-2, BIO-3**, **BIO-4, BIO-5, BIO-6, and BIO-7** are required to ensure compliance with the City's MHPA Land Use Adjacency Guidelines and VPHCP, and would ensure potential impacts from construction are avoided and minimized.

BIO-2 **Project Biologist** - Prior to the pre-construction meeting and the start of any project work the owner/permittee shall provide a letter to the City's Mitigation Monitoring Coordination (MMC) section stating that a Project Biologist (Qualified Biologist), as defined in the City of San Diego's Biological Guidelines (2018), has been retained to implement the project's biological monitoring program. The biologist(s) shall be knowledgeable of vernal pool species biology and ecology, and burrowing owl biology and ecology. The letter shall include the names and contact information of all persons involved in the biological monitoring of the project. The project biologist will perform the following duties:

I. Prior to Construction

A. **Pre-Construction Meeting** – The Qualified Biologist(s) shall attend the pre-construction meeting, discuss the project's biological monitoring program, and arrange to perform any follow up mitigation measures and reporting including site-specific monitoring, restoration or revegetation, and additional fauna/flora surveys/salvage.

B. **Biological Documents** – The Qualified Biologist shall submit all required documentation to MMC verifying that any special mitigation reports including but not limited to, maps, plans, surveys, survey timelines, or buffers are completed or scheduled per City Biology Guidelines, MSCP,VPHCP, ESL Ordinance, project permit conditions, CEQA, endangered species acts (ESAs), and/or other local, state, or federal requirements.

C. **Biological Construction Mitigation/Monitoring Exhibit** – The Qualified Biologist shall present a Biological Construction Mitigation/Monitoring Exhibit (BCME), which includes the biological documents in B above. In addition, it includes: restoration/revegetation plans, plant salvage/relocation requirements (e.g., coastal cactus wren plant salvage, burrowing owl exclusions, etc.), avian or other wildlife surveys/survey schedules (including general avian nesting and USFWS protocol), timing of surveys, wetland buffers, vernal pool buffer, avian construction avoidance areas/noise buffers/ barriers, other impact avoidance areas, and any subsequent requirements determined by the Qualified Biologist and the City ADD/MMC. The BCME shall include a site plan, written and graphic depiction of the project's biological mitigation/monitoring program, and a schedule. The BCME shall be approved by MMC and referenced in the construction documents.

D. **Resource Delineation** – Prior to construction activities, the Qualified Biologist shall supervise the placement of orange construction fencing (or equivalent) along the limits of disturbance adjacent to sensitive biological habitats and verify compliance with any other project conditions as shown on the BCME. The Qualified Biologist shall oversee the installation of erosion control measures within and upslope of vernal pools. This phase shall include flagging plant specimens and delimiting buffers to protect sensitive biological resources (e.g., habitats/flora and fauna species, including nesting birds) during construction. Appropriate steps/care should be taken to minimize attraction of nest predators to the site.

E. **Education** – Prior to commencement of construction activities, the Qualified Biologist shall meet with the owner/permittee or designee and the construction crew and conduct an on-site educational session regarding the need to avoid impacts outside of the approved construction area and to protect sensitive flora and fauna. At a minimum, training shall include (1) the purpose for resource protection; (2) a description of the vernal pool species and their habitat(s); (3) the conservation measures that must be implemented during project construction to conserve the vernal pool species, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing); (4) environmentally responsible construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program (MMRP), the need to adhere to the provisions of Federal Endangered Species Act (FESA), and the penalties associated with violating FESA.

F. **Avian Protection Requirements** – To avoid direct impacts to avian species identified as a listed, candidate, sensitive, or special status species in the MSCP, removal of habitat that supports active nests in the proposed area of disturbance should occur outside of the breeding season for these species (February 1 to September 15). If removal of habitat in the proposed area of disturbance must occur during the breeding season, the Qualified Biologist shall conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant shall submit the results of the pre-construction survey to City Development Services Department for review and approval prior to initiating any construction activities. If nesting birds are detected, a letter report or mitigation plan in conformance with the City's Biology Guidelines and applicable state and federal law (i.e., appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) shall be prepared and include proposed measures to be implemented to ensure that take of birds or eggs or disturbance of breeding activities is avoided. The report or mitigation plan shall be submitted to the City for review and approval and implemented to the satisfaction of the City. The City's MMC Section and Qualified Biologist shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction.

II. During Construction

A. **Monitoring** – All construction (including access/staging areas) shall be restricted to areas previously identified, proposed for development/staging, or previously disturbed as shown on "Exhibit A" and/or the BCME. The Qualified Biologist shall monitor construction activities as needed to ensure that construction activities do not encroach into biologically sensitive areas, or cause other similar damage, and that the work plan has been amended to accommodate any sensitive species located during the pre-construction surveys.

The Qualified Biologist shall periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

B. **Monitoring (Vernal Pools)** - The Qualified Biologist shall inspect the fencing and erosion control measures within and upslope of vernal pool preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.

C. **Subsequent Resource Identification** – The Qualified Biologist shall note/act to prevent any new disturbances to habitat, flora, and/or fauna on site (e.g., flag plant specimens for avoidance during access, etc.). If active nests or other previously unknown sensitive resources are detected, all project activities that directly impact the resource shall be delayed until species specific local, state, or federal regulations have been determined and applied by the Qualified Biologist.

D. **Stop Work** – Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to the City with 24 hours of its occurrence.

E. **Reporting** – Submit regular (e.g. weekly) letter reports to MMC and the City representative during project construction. In addition, the Qualified Biologist shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR shall be e-mailed to MMC on the first day of monitoring, the first week of each month, the last day of monitoring, and immediately in the case of any undocumented condition or discovery.

III. Post Construction Measures

A. **Final Report** - Submit a final report following completion of construction. The final report shall include as-built construction drawings with an overlay of habitat that was impacted and avoided, photographs of habitat areas that were avoided, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved. In the event that impacts exceed previously allowed amounts, additional impacts shall be mitigated in accordance with City Biology Guidelines, ESL and MSCP, VPHCP, State CEQA, and other applicable local, state, and federal law. The Qualified Biologist shall submit a final BCME/report to the satisfaction of the City ADD/MMC within 30 days of construction completion.

BIO-3: Vernal Pool Minimization and Avoidance Measures

The following Measures are required to prevent potential impacts to Vernal Pools from construction activities and are pursuant to Section 5.2.1 of the VPHCP:

1. Any development adjacent to the MHPA shall be constructed to slope away from the extant pools to be avoided, to ensure that runoff from the project does not flow into the pools.

2. Covered projects shall require temporary fencing (with silt barriers) of the limits of project impacts (including construction staging areas and access routes) to prevent additional vernal pool impacts and prevent the spread of silt from the construction zone into adjacent vernal pools. Fencing shall be installed in a manner that does not impact habitats to be avoided. Final construction plans shall include photographs that show the fenced limits of impact and all areas of vernal pools to be impacted or avoided. If work inadvertently occurs beyond the fenced or demarcated limits of impact, all work shall cease until the problem has been remedied to the satisfaction of the City. Temporary construction fencing shall be removed upon project completion.

3. Impacts from fugitive dust that may occur during construction grading shall be avoided and minimized through watering and other appropriate measures.

4. A qualified monitoring biologist that has been approved by the City shall be on-site during project construction activities to ensure compliance with all construction measures identified in the CEQA environmental document. The biologist shall be knowledgeable of vernal pool species biology and ecology. The biologist shall perform the following duties:

    a. Oversee installation of and inspect the fencing and erosion control measures within or upslope of vernal pool restoration and/or preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.

    b. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

    c. Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented by construction personnel. At a minimum, training shall include (1) the purpose for resource protection; (2) a description of the vernal pool species and their habitat(s); (3) the conservation measures that must be implemented during project construction to conserve the vernal pool species, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing); (4) environmentally responsible construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program (MMRP), the need to adhere to the provisions of FESA, and the penalties associated with violating FESA.

    d. Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to the City within 24 hours of its occurrence.

    e. Submit regular (e.g., weekly) letter reports to the City during project construction and a final report to the City following completion of construction. The final report shall include as-built construction drawings with an overlay of habitat that was impacted and avoided, photographs of habitat areas that were avoided, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved.

5. The following conditions shall be implemented during project construction:

    a. Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint.

    b. The project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.

    c. Disposal or temporary placement of excess fill, brush, or other debris shall be limited to areas within the fenced project footprint.

6. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas within the fenced project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent any runoff from entering the vernal pools or their watersheds and shall be shown on the construction plans. Fueling of equipment shall take place within existing paved areas greater than 100 feet from the vernal pools or their watersheds. Contractor equipment shall be checked for leaks prior to operation and repaired as necessary. A spill kit for each piece of construction equipment shall be on-site and must be used in the event of a spill. "No-fueling zones" shall be designated on construction plans.

7. Grading activities immediately adjacent to vernal pools shall be timed to avoid wet weather to minimize potential impacts (e.g., siltation) to the vernal pools unless the area to be graded is at an elevation below the pools. To achieve this goal, grading adjacent to avoided pools shall comply with the following:

    a. Grading shall occur only when the soil is dry to the touch both at the surface and 1 inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 inch below indicates whether the soil is dry.

    b. After a rain of greater than 0.2-inch, grading shall occur only after the soil surface has dried sufficiently as described above, and no sooner than 2 days (48 hours) after the rain event ends.

    c. To prevent erosion and siltation from storm water runoff due to unexpected rains, best management practices (i.e., silt fences) shall be implemented as needed during grading.

    d. If rain occurs during grading, work shall stop and resume only after soils are dry, as described above.

    e. Grading shall be done in a manner to prevent runoff from entering preserved vernal pools.

    f. If necessary, water spraying shall be conducted at a level sufficient to control fugitive dust but not to cause runoff into vernal pools.

    g. If mechanized grading is necessary, grading shall be performed in a manner to minimize soil compaction (i.e., use the smallest type of equipment needed to feasibly accomplish the work).

8. Prior to project construction, topsoil shall be salvaged from the impacted vernal pools or road ruts with fairy shrimp on-site consistent with the requirements of the approved restoration plan (e.g., free of versatile fairy shrimp [*Branchinecta lindahli*]). Vernal pool soil (inoculum) shall be collected when dry to avoid damaging or destroying fairy shrimp cysts and plant seeds. Hand tools (i.e., shovels and trowels) shall be used to remove the first 2 inches of soil from the pools. Whenever possible, the trowel shall be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling, which can damage the cysts. The soil from each pool shall be stored individually in labeled boxes that are adequately ventilated and kept out of direct sunlight in order to prevent the occurrence of fungus or excessive heating of the soil and stored off-site at an appropriate facility for vernal pool inoculum. Inoculum from different source pools shall not be mixed for seeding any restored pools, unless otherwise approved by the City and Wildlife Agencies. The collected soils shall be spread out and raked into the bottoms of the restored pools. Topsoil and plant materials salvaged from the upland habitat areas to be impacted shall be transplanted to, and/or used as a seed/cutting source for, the upland habitat restoration/creation areas to the maximum extent practicable as approved by the City.

    For this project, vernal pool soil will be collected and provided to the Airport Biologist for storage. The inoculum will not be used at the Otay 1-acre mitigation site for this project. The inoculum will be held by the Airport for use in a future vernal pool restoration project. The inoculum shall be packaged appropriately for long term storage (1 to 2 years).

9. Permanent protective fencing along any interface with developed areas and/or use other measures approved by the City to deter human and pet entrance into on- or off-site habitat shall be installed. Fencing shall be shown on the development plans and should have no gates (accept to allow access for maintenance and monitoring of the biological conservation easement areas) and be designed to prevent intrusion by pets. Signage for the biological conservation easement area shall be posted and maintained at conspicuous locations. The requirement for fencing and/or other preventative measures shall be included in the project's mitigation program.

In addition to the measures listed above, the following project specific measures shall be implemented to protect vernal pools:

A. **Culvert Inlet Protection** – Prior to the start of any construction work, storm drain inlet protection BMP's shall be installed at the culvert/drainage on the south corner of the building. The BMP's shall be installed to prevent any silt, toxins, or construction debris from entering the drainage and the adjacent vernal pools.

B. **Vehicles and Construction Equipment** – All construction equipment shall be washed/cleaned prior to entering the project area and after exiting the project area to prevent the spread of invasive species and fairy shrimp cysts.

BIO-4: California Gnatcatcher

Prior to the issuance of any grading permit, Notice to Proceed (NTP), or Pre-construction meeting, the City Deputy Director (or appointed designee) shall verify that the Multi-Habitat Planning Area (MHPA) boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the construction plans:

No clearing, grubbing, grading, or other construction activities shall occur between March 1 and August 15, the breeding season of the coastal California gnatcatcher, until the following requirements have been met to the satisfaction of the city manager:

A. A qualified biologist (possessing a valid endangered species act section 10(a)(1)(a) recovery permit) shall survey those habitat areas <u>within the MHPA</u> that would be subject to construction noise levels exceeding 60 decibels [dB(A)] hourly average for the presence of the coastal California gnatcatcher. Surveys for the coastal California gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife service within the breeding season prior to the commencement of any construction. If gnatcatchers are present, then the following conditions must be met:

   I. Between March 1 and August 15, no clearing, grubbing, or grading of occupied gnatcatcher habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; <u>and</u>

   Ii. Between March 1 and August 15, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 dB (A) hourly average at the edge of occupied gnatcatcher habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB (A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the city representative at least two weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; <u>or</u>

   iii. At least two weeks prior to the commencement of construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average at the edge of habitat occupied by the coastal California gnatcatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring* shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB (A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (August 16).

* Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB (A) hourly average or to the ambient noise level if it already exceeds 60 dB (A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the City representative, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

B. If coastal California gnatcatchers are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the city manager and applicable resource agencies which demonstrates whether or not mitigation measures such as noise walls are necessary between March 1 and August 15 as follows:

I. If this evidence indicates the potential is high for coastal California gnatcatcher to be present based on historical records or site conditions, then condition A.iii shall be adhered to as specified above.

Ii. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

BIO-5: Burrowing Owl

Implementation of Measure BIO-5 would reduce potential impacts from construction and ensure significant impacts are avoided.

I. Prior to Start of Construction:

A. The Applicant Department or Permit Holder and Qualified Biologist must ensure that initial pre-construction/take avoidance surveys of the project "site" are completed between 14 and 30 days before initial construction activities, including brushing, clearing, grubbing, or grading of the project site; regardless of the time of the year. "Site" means the project site and the area within a radius of 450 feet of the project site. The report shall be submitted and approved by the City MSCP staff prior to construction or BUOW eviction(s) and shall include maps of the project site and BUOW locations on aerial photos.

B. The pre-construction survey shall follow the methods described in CDFG 2012, Staff Report -Appendix D *(please note, in 2013, CDFG became California Department of Fish and Wildlife or CDFW).*

C. 24 hours prior to commencement of ground disturbing activities, the Qualified Biologist shall verify results of preconstruction/take avoidance surveys. Verification shall be provided to the City's Mitigation Monitoring and Coordination (MMC) Section. If results of the preconstruction surveys have changed and BUOW are present in areas not previously identified, immediate notification to the City and WA's shall be provided prior to ground disturbing activities.

II. During Construction:

A. Best Management Practices shall be employed as BUOWs are known to use open pipes, culverts, excavated holes, and other burrow-like structures at construction sites. Legally permitted active construction projects which are BUOW occupied and have followed all protocol in this mitigation section, or sites within 450 feet of occupied BUOW areas, should undertake measures to discourage BUOWs from recolonizing previously occupied areas or colonizing new portions of the site. Such measures include, but are not limited to, ensuring that the ends of all pipes and culverts are covered when they are not being worked on, and covering rubble piles, dirt piles, ditches, and berms.

B. **On-going BUOW Detection** - If BUOWs or active burrows are not detected during the pre-construction surveys, Section "A" below shall be followed. If BUOWs or burrows are detected during the pre-construction surveys, Section "B" shall be followed. Neither the MSCP subarea plan nor this mitigation section allows for any BUOWs to be injured or killed outside **or** within the MHPA; in addition, impacts to BUOWs within the MHPA must be avoided.

a. **Post Survey Follow Up if Burrowing Owls and/or Signs of Active Natural or Artificial Burrows Are <u>Not</u> Detected During the Initial Pre-Construction Survey -** Monitoring the site for new burrows is required using CDFW Staff Report 2012 Appendix D methods for the period following the initial pre-construction survey, until construction is scheduled to be complete and is complete *(NOTE - Using a projected completion date (that is amended if needed) will allow development of a monitoring schedule).*

   i. If no active burrows are found but BUOWs are observed to occasionally (1-3 sightings) use the site for roosting or foraging, they should be allowed to do so with no changes in the construction or construction schedule.

   ii. If no active burrows are found but BUOWs are observed during follow up monitoring to repeatedly (4 or more sightings) use the site for roosting or foraging, the City's Mitigation Monitoring and Coordination (MMC) Section shall be notified and any portion of the site where owls have been sites and that has not been graded or otherwise disturbed shall be avoided until further notice.

   iii. If a BUOW begins using a burrow on the site at any time after the initial pre-construction survey, procedures described in Section B must be followed.

   iv. Any actions other than these require the approval of the City and the Wildlife Agencies.

b. **Post Survey Follow Up if Burrowing Owls and/or Active Natural or Artificial Burrows are detected during the Initial Pre-Construction Survey -** Monitoring the site for new burrows is required using Appendix D CDFG 2012, Staff Report for the period following the initial pre-construction survey, until construction is scheduled to be complete and is complete *(NOTE - Using a projected completion date (that is amended if needed) will allow development of a monitoring schedule which adheres to the required number of surveys in the detection protocol).*

   i. This section (B) applies only to sites (including biologically defined territory) wholly outside of the MHPA – **all direct and indirect impacts to BUOWs within the MHPA <u>SHALL</u> be avoided.**

   ii. If one or more BUOWs are using any burrows (including pipes, culverts, debris piles *etc.*) on or within 300 feet of the proposed construction area, the City's MMC Section shall be contacted. The City's MMC Section shall contact the Wildlife Agencies regarding eviction/collapsing burrows and enlist appropriate City biologist for on-going coordination with the Wildlife Agencies and the qualified consulting BUOW biologist. No construction shall occur within 300 feet of an active burrow without written concurrence from the Wildlife Agencies. This distance may increase or decrease, depending on the burrow's location in relation to the site's topography, and other physical and biological characteristics.

      1. **Outside the Breeding Season** - If the BUOW is using a burrow on site outside the breeding season (i.e. September 1 – January 31), the BUOW may be evicted after the qualified BUOW biologist has determined via fiber optic camera or other appropriate device, that no eggs, young, or adults are in the burrow and written concurrence from the Wildlife Agencies for eviction is obtained prior to implementation.

      2. **During Breeding Season** - If a BUOW is using a burrow on-site during the breeding season (Feb 1-Aug 31), construction shall not occur within 300 feet of the burrow until the young have fledged and are no longer dependent on the burrow, at which time the BUOWs can be evicted. Eviction requires written concurrence from the Wildlife Agencies prior to implementation.

c. **Survey Reporting During Construction -** Details of construction surveys and evictions (if applicable) carried out shall be immediately (within 5 working days or sooner) reported to the City's MMC

Section and the Wildlife Agencies and must be provided in writing (as by e-mail) and acknowledged to have been received by the required Agencies and DSD Staff member(s).

III. **Post Construction**:

A. Details of the all surveys and actions undertaken on-site with respect to BUOWs (i.e. occupation, eviction, locations etc.) shall be reported to the City's MMC Section and the Wildlife Agencies within 21 days post-construction and prior to the release of any grading bonds. This report must include summaries off all previous reports for the site; and maps of the project site and BUOW locations on aerial photos.

BIO-6: Revegetation of Temporary Impacts

Following completion of all construction work, any areas where soils were temporarily disturbed and not developed, shall be revegetated for erosion control, in accordance with the City's Landscape Standards and biological guidelines. A native low-grow upland seed mix shall be applied via hydroseed to all areas temporarily impacted. The Project Biologist will be responsible for developing the seed palette and must submit to MMC and the City's Representative for approval. Revegetated areas will be maintained and monitored for a minimum of 25-months to ensure successful erosion control.

BIO-7: Installation of Barrier

Following completion of all construction work, a barrier shall be installed along both sides of the access road from Ponderosa Ave to the control tower parking lot to prevent unauthorized access into the MHPA and adjacent sensitive habitat. The barrier shall also be installed along the north-eastern boundary of the project footprint. The barrier design shall prevent vehicle access into environmentally sensitive areas and may consist of poles 3 to 4 feet tall with a rope or chain ran between the poles. The design of the barrier must be approved by Airport staff prior to installation and the installation must be monitored by a qualified vernal pool biologist. Signage for environmentally sensitive areas shall be posted and maintained at conspicuous locations along the barrier.

8 ACKNOWLEDGEMENTS

The following biologist contributed to the fieldwork and/or the preparation of this report.

Douglas Allen	Biologist III, City of San Diego, Park and Recreation Department M.S., Biology; San Diego State University, 1997 B.S., Biology; San Diego State University, 1986
Rebecca Alvidrez	Biologist III, City of San Diego, Public Works Department B.S., Ecology and Evolution; UC Santa Cruz, 2003
Cindy Dunn	Biologist III, City of San Diego, Airports – Real Estate Assets Department B.S., Ecology, Behavior, and Evolution; UC San Diego, 2006
Maya Mazon[1]	Biologist III, City of San Diego, Public Works Department M.S., Plant Physiological Ecology; California State University – Fullerton, 2010 B.S., Botany and Ecology, California State University – Fullerton, 2002
Sean Paver[1]	Senior Planner/Biologist, City of San Diego, Public Works Department B.S., Conservation Biology; Arizona State University, 2008

[1] Contributing Author to Report

9 REFERENCES

Baldwin, B.G., Goldman, D.H., Keil, D.J., Patterson, R., Rosatti, T.J. (eds). 2011. *The Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded.* University of California Press, Berkeley, California. 1400 pp.

California Department of Fish and Game (CDFG).

2008. California Department of Fish and Game Natural Diversity Data Base – Electronic Format.

2016a Natural Diversity Database. Nongame-Heritage Program, California Department of Fish and Wildlife, Sacramento.

2016b Natural Diversity Database. April 2016. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 126 pp.

2016c Natural Diversity Database. April 2016. Special Animals List. Periodic publication. 51 pp.

California Native Plant Society (CNPS). 2018. *Inventory of Rare and Endangered Plants* (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Thursday, June 7, 2018.

City of San Diego

1997. *City of San Diego MSCP Subarea Plan*.

2018. *Biology Guidelines of the San Diego Municipal Code's Land Development Code*.

2003. *City of San Diego 2002-2003 Vernal Pool Inventory.*

2011. *Significance Determination Guidelines Under the California Environmental Quality Act.*

2017. *City of San Diego Vernal Pool Habitat Conservation Plan.*

County of San Diego

2018 SanBIOS GIS Database. Created in 2009. Available at: http://www.sangis.org/. Accessed June 2018.

Eriksen, C. and Belk, D. 1999. *Fairy Shrimps of California's Puddles, Pools and Playas*. Mad River Press, Eureka, California.

Fisher, R.N. and Case, T.J. 1997. *A Field Guide to the Reptiles and Amphibians of Coastal Southern California*. United States Geological Service. San Mateo, CA.

Gervais, J.A., Rosenberg, D.K. and Comrack, L.A. 2008. Burrowing Owl (*Athene cunicularia*) In Shuford, W.D and Gardali, T. (Eds.) *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. Western Field Ornithologists and California Department of Fish and Game, Studies of Western Birds 1: pp 218-226

Google

2018 Google Earth. US Department of State Geographer. Data SIO, U.S. Navy, NGA, GEBCO. Available at: earth.google.com/ Accessed June and July 2018.

Greenwood. N. H. and Abbott, P.L. 1980. The physical environment of H series vernal pools, Del Mar Mesa, San Diego County. Report prepared for California Department of Transportation, San Diego, California.

Haug, E.S., Millsap, B.A, and Martell, M.S. 1993. Burrowing Owl (*Speotyto cunicularia*), In A. Poole and Gill, F. (Eds.) *The Birds of North America*, The Academy of Natural Sciences, Philadelphia, Pennsylvania, and The American Ornithologists' Union., Washington, D.C., USA.

Keck, D. 2012a. *Brodiaea orcuttii* in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=6107. Accessed on June 7, 2018.

Keck, D. 2012b. *Holocarpha virgata* ssp. *elongata* in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=6107. Accessed on June 7, 2018.

Kimley-Horn and Associates, Inc. 2012. *Draft Burrowing Owl Survey Report for the Montgomery Field Reconstruct Runway 5-23 and Taxiway G Project, San Diego, CA*.

Holland, R.F. 1986. *Preliminary descriptions of the terrestrial natural communities of California*. State of California, The Resources Agency.

Laudenslayer, William F., Jr., W. E. Grenfell, Jr. and D. Zeiner. 1991. A check-list of the amphibians, reptiles, birds, and mammals of California. The Resources Agency: 77(3): 109-141.

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. March 2008. Draft Vegetation Communities of San Diego County. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California", Robert F. Holland, Ph.D., October 1986.

Ogden Environmental. 1998. *Multiple Species Conservation Program*: MSCP Plan.

Recon Environmental, Inc. 2008. *Final Environmental Constraints Report for West and Northwest Areas of Montgomery Field Airport, San Diego, California*.

Reiser, C. H. 1994. *Rare plants of San Diego County*. Imperial Beach: Aquifer Press. May. 180 pp. Sibley,

D.A. 2000. *The Sibley Guide to Birds, National Audubon Society.* Chanticleer Press, Inc. New

York.

Simovich, M.A. and Hathaway, S.A. 1996. Diversified Bet-Hedging as a Reproductive Strategy of Some Ephemeral Pool Anostracans. Journal of Crustaceans Biology 17: 38-44.

J.P. Rebman and Simpson, M.G. 2014. *Checklist of the Vascular Plants of San Diego County*, 5th Edition.

Thomsen, L. 1971 Behavior and Ecology of Burrowing Owls on the Oakland Municipal Airport. Condor 73: 177-192

United States Fish and Wildlife Service (USFWS)

2016a Species Occurrence Metadata w. Carlsbad Fish and Wildlife Office. June and July 2018.

2016b Critical Habitat Portal. Available at: http://www.fws.gov/endangered/what-wedo/critical-habitats.html. Accessed June 2018.

University of California, Berkeley (UC Berkeley)

2018 *The Jepson Online Interchange – California Floristics*. Regents of the University of California. Available at: http://ucjeps.berkeley.edu/interchange/. Accessed June 2018.

Zedler, P. 1987. The ecology of southern California vernal pools: a community profile. Biological Reports 85 (7.11). Prepared for USFWS, National Wetlands Center, Washington D.C.

Zedler, P.H. and Ebert, T. A. 1979. A survey of vernal pools of Kerny Mesa, San Diego County, spring 1979. Report prepared for the Department of Transportation, San Diego, California

Figure 1: Project Site Location on USGS Map

Fire Rescue Air Operations Phase II

FIRE-RESUCE AIR OPERATION - PHASE II

FIGURE 2: Project Location and 100-Foot Survey Limit

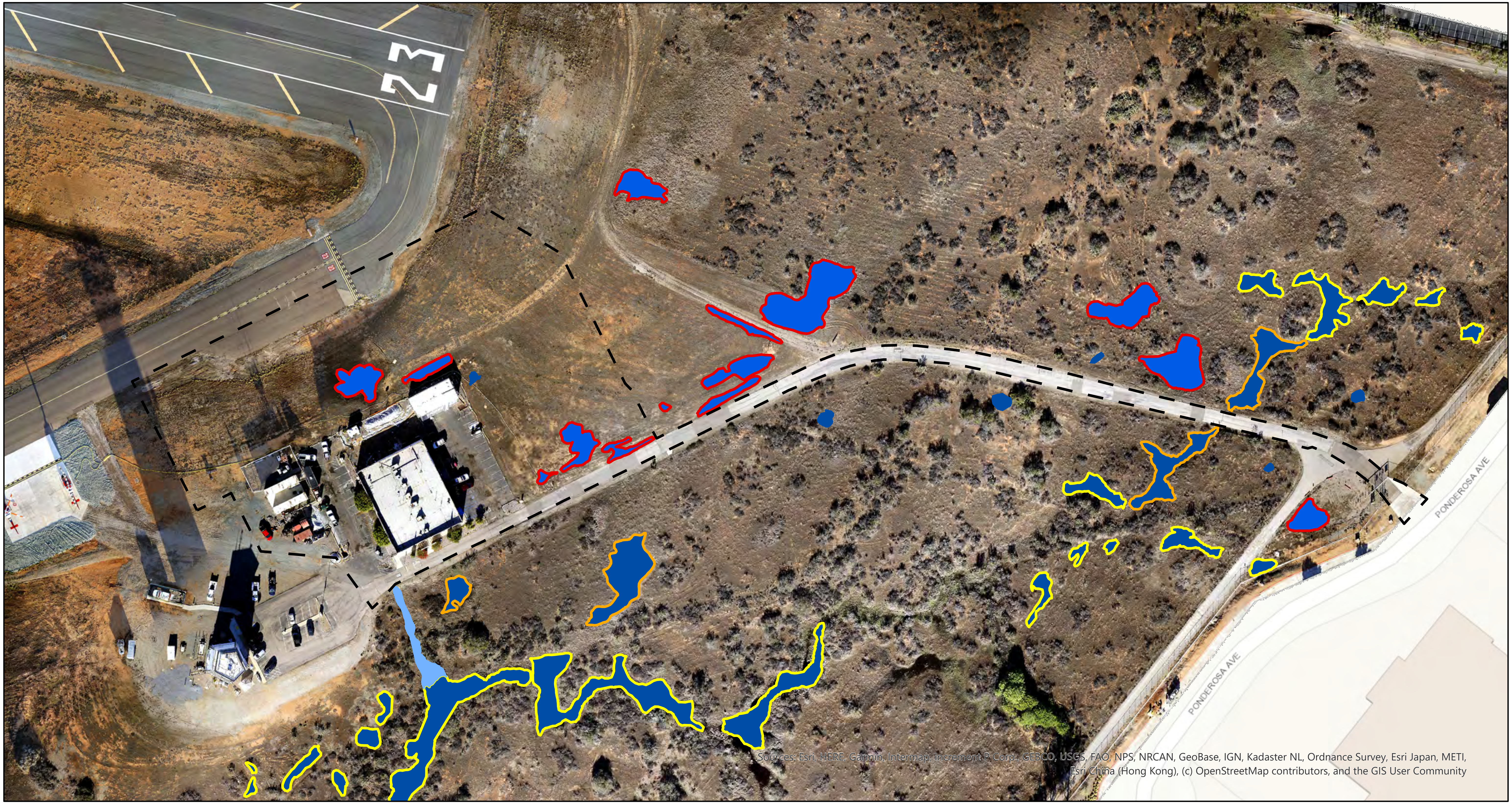
SD Public Works

FIRE-RESCUE AIR OPERATION - PHASE II

FIGURE 3: Vegetation Types

Project Footprint
San Diego Mesa Hardpan Vernal Pool
Developed
Diegan Coastal Sage Scrub
Disturbed
Non-Native Grassland
MHPA

SD Public Works



FIRE-RESCUE AIR OPERATION - PHASE II

FIGURE 4a: Vernal Pool Locations and Vernal Pool Species Present

Feet
0 50 100 200 300

- Project Footprint
- Drainage
- Vernal Pool with Indicator Plants
- Vernal Pool - San Diego Fairy Shrimp Occupied
- Vernal Pool - San Diego Fairy Shrimp & Mesa Mint Occupied
- Vernal Pool - San Diego Mesa Mint Occupied

SD Public Works

FIRE-RESCUE AIR OPERATION - PHASE II

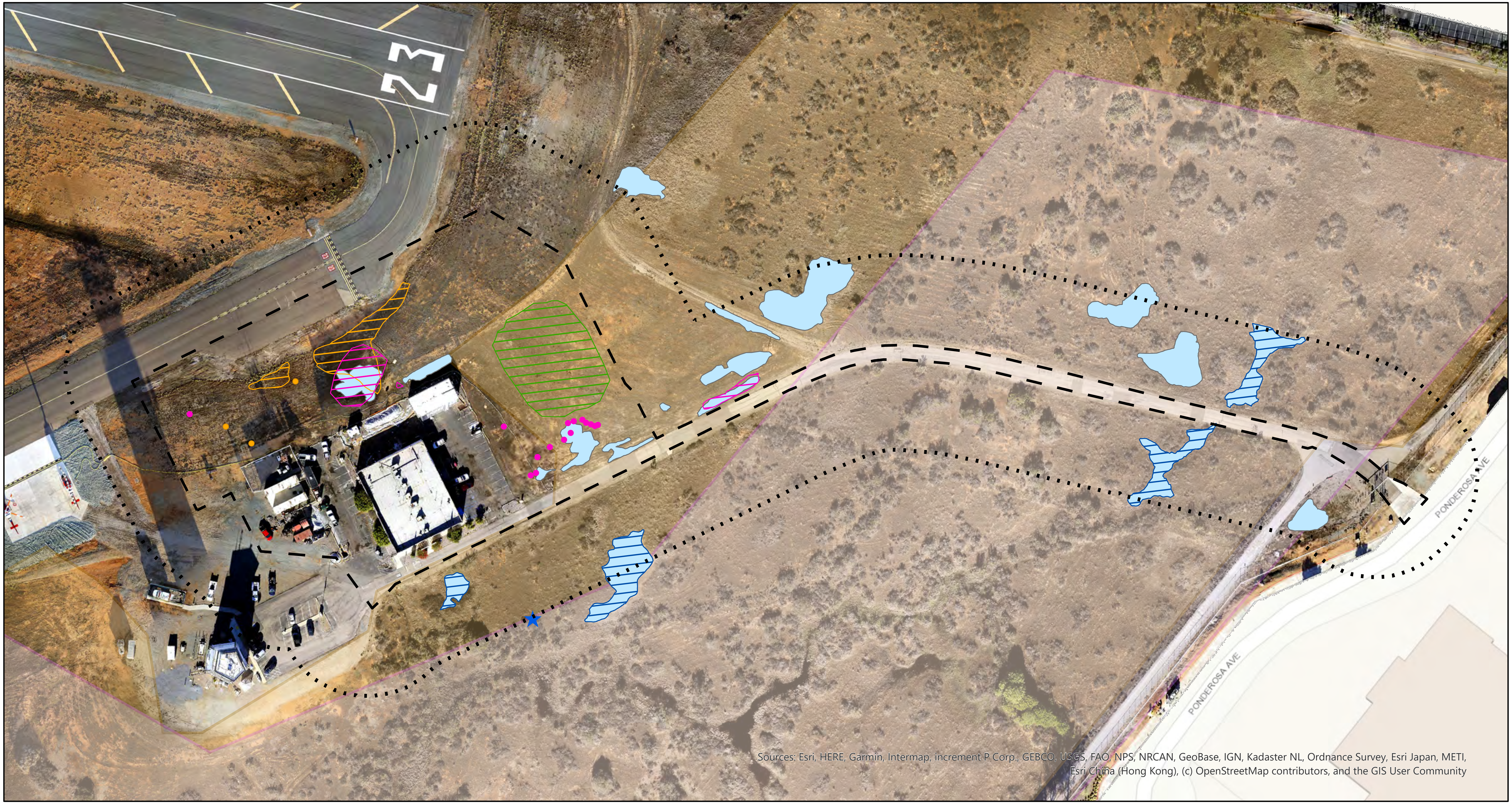
FIGURE 4b: Vernal Pool Locations and Vernal Pool Species Present

Feet: 0, 50, 100, 200, 300

- Project Footprint
- Drainage
- Vernal Pool with Indicator Plants
- Vernal Pool - San Diego Fairy Shrimp Occupied
- Vernal Pool - San Diego Fairy Shrimp & Mesa Mint Occupied
- Vernal Pool - San Diego Mesa Mint Occupied

N

SD Public Works



FIRE-RESCUE AIR OPERATION - PHASE II

FIGURE 5a: Sensitive Species Locations within the 100-Foot Survey Limit

0 50 100 200 300 Feet

Project Footprint
100-Foot Survey Limit

Sensitive Species Observed
Ashy spike-moss
Graceful tarplant
Orcutt's brodiaea
Graceful tarplant
Orcutt's brodiaea
San Diego Mesa Mint
California Gnatcatcher
San Diego Fairy Shrimp

USFWS Critical Habitat
San Diego Fairy Shrimp Critical Habitat
Spreading Navarretia Critical Habitat

Public Works

FIRE-RESCUE AIR OPERATION - PHASE II

FIGURE 5b: Sensitive Species Locations within the 100-Foot Survey Limit

Project Footprint
100-Foot Survey Limit

Sensitive Species Observed

Ashy spike-moss
Graceful tarplant
Orcutt's brodiaea
Graceful tarplant
Orcutt's brodiaea
San Diego Mesa Mint
California Gnatcatcher
San Diego Fairy Shrimp

USFWS Critical Habitat

San Diego Fairy Shrimp Critical Habitat
Spreading Navarretia Critical Habitat

0 50 100 200 300 Feet

N

SD Public Works

0 50 100 200 300 Feet

FIRE-RESUCE AIR OPERATION - PHASE II

FIGURE 6: Vernal Pool Watersheds and Buffers

- Project Footprint
- 100-Foot Survey Limit
- Vernal Pool Watershed
- Drainage
- Vernal Pool with Indicator Plants
- Vernal Pool - San Diego Fairy Shrimp Occupied
- Vernal Pool - San Diego Fairy Shrimp & Mesa Mint Occupied
- Vernal Pool - San Diego Mesa Mint Occupied

SD Public Works

APPENDIX A

PHOTO DOCUMENTATION

Appendix A: Photopoint Locations
Fire Rescue Air Operations Phase II

Photo 1. View of Non-Native Grassland (Tier IIIB) facing southwest.

Photo 2. View of Disturbed Habitat (Tier IV) facing southwest.

Photo 3. View of Developed Land (Tier IV) facing northwest.

Photo 4. View of San Diego Mesa Hardpan Vernal Pool (wetland) facing southwest, outside the project footprint.

Photo 5. View of Diegan Coastal Sage Scrub (Tier II) in the background facing east.

Photo 6. Orcutt brodiaea (*Brodiaea orcuttii*) observed within the Project Area.

Photo 7. Graceful tarplant (*Holocarpa virgate* ssp. *elongata*) observed within the Project Area.

Photo 8. Ashy spike-moss (*Selaginella cinerascens)* observed within the Project Area.

Photo 9. Vernal Pool 4 (FOVP4) observed during inundation on March 19, 2018 within the Project Area facing north.

Photo 10. Vernal Pool 4 (FOV4) and 6 (FOVP6) observed during inundation on January 10, 2018 within the Project Area facing northeast.

Photo 11. Vernal Pool 7 (FOVP7) observed within the Project Area facing southeast. No sustaining inundation occurred at this vernal pool.

Photo 12. Vernal Pool 9 (FOVP9) observed within the Project Area facing southwest. No sustaining inundation occurred at this vernal pool.

APPENDIX B

FLORA AND FAUNA LIST

Appendix B
Flora and Fauna List

Flora List

Scientific Name	Common Name	Vegetation Community
LYCOPHYTES		
SELAGINELLACEAE	**Spike-Moss Family**	
Selaginella cinerascens	ashy spike-moss	D
ANGIOSPERMS (EUDICOTS)		
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**	
Malosma laurina	laurel sumac	DCSS
APIACEAE	**CARROT FAMILY**	
Daucus pusillus	rattlesnake weed	DCSS
ASTERACEAE	**SUNFLOWER FAMILY**	
Baccharis pilularis	coyote brush	DCSS, NNG
*Centaurea melitensis**	tocalote	D, NNG
*Cotula coronopifolia**	brass-buttons	VP
Deinandra fasciculata	fascicled tarweed	DCSS
*Dimorphotheca sinuata**	blue-eye cape-marigold	D, NNG, VP
Holocarpha virgata subsp. *elongata*	graceful tarplant	NNG, VP
*Hypochaeris glabra**	smooth cat's-ear	D, NNG
Psilocarphus brevissimus[VP]	woolly marbles	VP
BRASSICACEAE	**MUSTARD FAMILY**	
Lepidium nitidum	shining peppergrass	D, NNG
CAMPANULACEAE	**BELLFLOWER FAMILY**	
Downingia cuspidata[VP]	cupidate downingia	VP
CRASSULACEAE	**STONECROP FAMILY**	
Crassula connata	pygmy-weed	D
EUPHORBIACEAE	**SPURGE FAMILY**	
Chamaesyce polycarpa	golondrina	D, NNG
FABACEAE	**LEGUME FAMILY**	

Appendix B
Flora and Fauna List

Acmispon americanus var. *americanus*	Spanish clover	D, VP
Acmispon glaber	deerweed	DCSS, D, NNG
Acmispon parviflorus	lotus micranthus	D, NNG, VP
Lupinus bicolor	miniature lupine	D
GERANIACEAE	**GERANIUM FAMILY**	
*Erodium cicutarium**	red-stemmed filaree	D, NNG, VP
*Erodium moschatum**	white-stemmed filaree	D, NNG, VP
LAMIACEAE	**MINT FAMILY**	
Pogogyne abramsii[VP]	San Diego mesa mint	VP
LYTHRACEAE	**LOOSESTRIFE FAMILY**	
*Lythrum hyssopifolia**	hyssop loosestrife	D, VP
MALVACEAE	**MALLOW FAMILY**	
*Malva parviflora**	cheeseweed	D, NNG
OROBANCHACEAE	**BROOM-RAPE FAMILY**	
Castilleja exserta	purple owl's-clover	D, VP
PLANTAGINACEAE	**PLANTAIN FAMILY**	
Plantago elongata[VP]	prairie plantain	VP
Plantago erecta	western plantain	D, NNG
POLYGONACEAE	**BUCKWHEAT FAMILY**	
Eriogonum fasciculatum	California buckwheat	DCSS, NNG
ROSACEAE	**ROSE FAMILY**	
Adenostoma fasciculatum	chamise	DCSS
ANGIOSPERMS (MONOCOTS)		
CYPERACEAE	**SEDGE FAMILY**	
Eleocharis sp.	spike-rush	VP
POACEAE	**GRASS FAMILY**	
Avena sp.*	wild oat	DCSS, D, NNG, VP
Bromus madritensis subsp. *rubens**	red brome	D, NNG, VP
*Hordeum murinum**	glaucous foxtail barley	D, NNG, VP

*Pennisetum setaceum**	fountain grass	D
THEMIDACEAE	**BRODIAEA FAMILY**	
Brodiaea orcuttii	Orcutt's brodiaea	D, VP
Muilla maritima	common muilla	D, VP

*Non-Native Species, VP Vernal Pool Indicator Species
Vegetation Communities: San Diego Mesa Claypan Vernal Pool (VP), Developed (Dev), Diegan Coastal Sage Scrub (DCSS), Disturbed (D), Non-Native Grassland (NNG)

Fauna List

Scientific Name	Common Name
CLASS BRACHIOPODA	**BRACHIOPODS**
Brachinecta sandiegonensis	San Diego fairy shrimp
CLASS INSECTA	**INSECTS**
PIERIDAE	**WHITES & SULPHURS**
Phoebis sennae marcellina	southern cloudless sulfur
NYMPHALIDAE	**BRUSH-FOOTED BUTTERFLIES**
Danaus plexippus	Monarch butterfly
Nymphalis antiopa	Mourning cloak
LYCAENIDAE	**GOSSAMER WINGS**
Icaricia acmon	Acmon blue
CLASS AVES	**BIRDS**
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
COLUMBIDAE	**PIGEONS & DOVES**
Zenaida macroura	mourning dove
STRIGIDAE	**TRUE OWLS**
Athene cunicularia	burrowing owl
CORVIDAE	**JAYS & CROWS**

Appendix B
Flora and Fauna List

Corvus corax	common raven
POLIOPTILIDAE	**GNATCATCHERS**
Polioptila californica	California gnatcatcher
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
EMBERIZIDAE	**EMBERIZIDS**
Melozone crissalis	California towhee
FRINGILLIDAE	**FINCHES**
Haemorhous mexicanus	house finch

APPENDIX C

POTENTIAL TO OCCUR TABLE

FLORA AND FAUNA

Appendix C

Potential to Occur Table: Sensitive Flora and Fauna

Species	Designation (ESA/CESA/CRPR CDFW)	Potential to Occur/Comments
Flora		
singlewhorl burrobrush (*Ambrosia monogyra*)	--/--/2B.2	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial shrub.
San Diego goldenstar (*Bloomeria clevelandii*)	--/--/1B.1	Not expected. Appropriate habitat exists within the site; however, if present, the species would have been observed as the survey was completed within the appropriate blooming period.
Orcutt's brodiaea (*Brodiaea orcuttii*)	--/--/1B.1/MSCP	Present within the Project footprint and the 100-foot survey buffer within San Diego Mesa Claypan Vernal Pools and Disturbed Habitat. Number of individuals observed is 132 individuals.
wart-stemmed ceanothus (*Ceanothus verrucosus*)	--/--/2B.2/MSCP	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial evergreen shrub.
summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*)	--/--/1B.2	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial evergreen shrub.
San Diego Button-Celery (*Eryngium aristulatum* var. *parishii*)	FE/SE/1B.1/NE/ MSCP/VPHCP	Not expected. Appropriate habitat exists within the site; however, if present, the species would have been observed as several surveys have been completed within the appropriate blooming period (Recon Environmental, Inc., 2008; City of San Diego, 2003).
San Diego barrel cactus (*Ferocactus viridescens*)	--/--/2B.1/MSCP	Absent. Appropriate habitat is present; however, individuals, if present, would have been observed as this species is a perennial stem succulent.
graceful tarplant (*Holocarpha virgata* ssp. *elongata*)	--/--/4.2	Present. 40 individuals were observed within the Project Footprint.
decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	--/--/1B.2	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial shrub.

Appendix C

Potential to Occur Table: Sensitive Flora and Fauna

little mousetail (*Myosurus minimus* ssp. *apus*)	--/--/3.1	Not expected. Appropriate habitat exists within the site; however, if present, the species would have been observed as several surveys have been completed within the appropriate blooming period (Recon Environmental, Inc., 2008; City of San Diego, 2003).
Prostrate Navarretia (*Navarretia fossalis*)	FT/--/1B.1/NE/ MSCP/VPHCP	Not expected. Appropriate habitat exists and the northeast portion of the Project Footprint and 100-foot survey buffer is mapped as critical habitat by USFWS. However, if present, the species would have been observed as several surveys have been completed within the appropriate blooming period (Recon Environmental, Inc., 2008; City of San Diego, 2003) within this specific area.
San Diego Mesa Mint (*Pogogyne abramsii*)	FE/SE/1B.1/NE/ MSCP/VPHCP	Absent. Individuals were observed within the 100-foot survey buffer but were not present within the project site. This species, if present, would have been observed.
Nuttall's scrub oak (*Quercus dumosa*)	--/--/1B.1	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial evergreen shrub.
Munz's sage (*Salvia munzii*)	--/--/2B.2	Absent. Appropriate habitat is not present within the project site and individuals, if present, would have been observed as this is a perennial evergreen shrub.
oil neststraw (*Stylocline citroleum*)	--/--/1B.1	Not expected. Habitat for this species occurs within the site; however, if present, the species would have been observed as the survey was completed within the appropriate blooming period.
Fauna		
California glossy snake (*Arizona elegans occidentalis*)	--/SSC	Low. Historical occurrences are documented within Montgomery Airfield; however, habitat present is of low quality and would likely only be used for foraging as it lacks shrubs or rocks and is routinely mowed. This species is generally inactive during the day and in the winter and can actively disperse; therefore, impacts to this species is not expected.
orange-throated whiptail (*Aspidoscelis hyperythra*)	--/--/MSCP	Low. Historical occurrences are documented within Montgomery Airfield; however, no appropriate habitat occurs on the site and would likely only be used for foraging as it is routinely mowed. This species can actively disperse; therefore, impacts to this species is not expected.
burrowing owl (*Athene cunicularia*)	--/SSC/MSCP	Low/Moderate. Low to Moderate habitat does occur within and adjacent to the project site. Burrowing owl have been previously identified on the airport and have a potential to forage near the project area. One individual was observed offsite, within the airport grounds. Mitigation measures will be implemented to avoid impacts to this species.

Appendix C

Potential to Occur Table: Sensitive Flora and Fauna

San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE/--/MSCP/VPHCP	Present. More than approximately 10,110 individuals observed within the 100-foot survey buffer.
pocketed free-tailed bat (*Nyctinomops femorosaccus*)	--/SSC	Absent. Appropriate habitat is not present within the site and the demolition of existing buildings is not within the scope of this project; therefore, impacts to this species is not expected.
coast horned lizard (*Phrynosoma blainvillii*)	--/SSC/MSCP	Not expected. Appropriate habitat is not present within the site as the soil is not sandy and is heavily compacted; therefore, impacts to this species is not expected.
coastal California gnatcatcher (*Polioptila californica californica*)	FT/SSC/MSCP	Present. One individual has been observed foraging within marginally suitable habitat east of the project area. No suitable habitat is located within the project site. Direct impacts to this species are not expected. Indirect impacts (noise), may occur as a result of construction activity. Mitigation measures will be implemented to avoid impacts to this species.
least Bell's vireo (*Vireo bellii pusillus*)	FE/SE/SSC/ MSCP	Low. Appropriate habitat is not present within or adjacent to the project site; therefore impacts to this species is not expected.

FE – Federally listed as Endangered
FT – Federally listed as Threatened
SE - State listed as Endangered
NE – City of San Diego Narrow Endemic Species
MSCP –Multiple Species Conservation Plan covered species
VPHCP – Vernal Pool Habitat Conservation Plan covered species

APPENDIX D

FAIRY SHRIMP PROTOCOL SURVEY REPORT

Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Hangers and Helicopter Parking Pad Project, San Diego, California

Fairy Shrimp Surveys: 2018/2019 Wet Season Survey Report

WGS # S-18007

September 2019

Prepared for:
United States Fish and Wildlife Service
2177 Salk Ave, Ste 250,
Carlsbad, CA 92008

Prepared by:
City of San Diego
Public Works Department
525 B Street, San Diego, CA 92101

Prepared By: ______________________________
Sean Paver, Senior Planner/Biologist

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

The City of San Diego is proposing to construct a new, permanent Fire Rescue Air Operations Facility (Project) at Montgomery-Gibbs Executive Airport (MYF). The facility will accommodate the emergency helicopters for the crews that will provide 24 hour on-call services 365 days per year. The project area would be approximately 3.719 acres, and the project would result in 1.99 acres of new impervious surfaces, including the hangars, fueling stations, heli-tender storage buildings, concrete aprons, ramps, vehicle parking, and a helicopter parking pad to accommodate a S-70A Firehawk. The proposed project is located completely within the existing the active MYF airfield and is outside of, but adjacent to the City's Multi-Habitat Planning Area (MHPA) boundary.

The purpose of the surveys was to determine the current status and location of listed fairy shrimp. Wet and Dry season surveys were conducted during the 2017/2018 season. This survey report focuses on the 2018/2019 wet season. The areas where the surveys were performed include the project footprint and an approximately 100-foot survey area. In total, 27 features were identified to potentially support habitat for fairy shrimp within the survey area. Previous surveys on MYF have documented the presence of the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*; SDFS). This report presents the results of the 2018/2019 wet season surveys.

SDFS were detected in five of the six features within the project development footprint; in total 19 of the 27 features within the survey area were determined to be occupied.

This page intentionally left blank

1.0 INTRODUCTION

This report presents the findings of the wet and dry season fairy shrimp survey conducted for the Montgomery-Gibbs Executive (MYF) Airport Fire Rescue Air Operations Facility Hangers Project (Project), located in the City of San Diego, California (Figure 1 and 2).

U.S. Fish and Wildlife (FWS) protocol fairy shrimp surveys were conducted to determine the current status of listed fairy shrimp in features located within and immediately adjacent to the proposed Project. These features had been reported as having the potential to support standing water, potential habitat for fairy shrimp. This report presents the results of the 2018/2019 wet season surveys.

1.1 Project Area

The Project is located on MYF, immediately east of State Route 163 (SR-163), north of Aero Drive, and South of Balboa Avenue, in the Kearny Mesa Community Planning Area (Council District 6) (City of San Diego 1997). Within the airfield the Project site is located, northern of runways 28R, east of Taxiway C, and north of the air traffic control tower (Figure 3). The project is located adjacent to the City of San Diego Multiple Habitat Planning Area (MHPA) (City of San Diego 1997). The topography of the survey area is relatively flat. It is developed with the current Fire-Rescue Air Operations, associated buildings, and parking areas. Areas of undeveloped land occur between Taxiway Charlie, and the existing air operations structures, within the project footprint (Figure 3). Vegetation communities documented within the vicinity of the study area include non-native grassland, disturbed habitat, developed, San Diego Mesa Hardpan Vernal Pools, and Diegan coastal sage scrub (Holland 1986, as modified by Oberbauer et al. 2008). A small drainage, that flows north to south, occurs approximately 149 feet (ft) east of the existing fire rescue air operations facility.

According to the City of San Diego's Vernal Pool Habitat Conservation Plan (City of San Diego 2017) the presence of vernal pools has been recorded adjacent to the project footprint. Focused, seasonally-appropriate protocol surveys for federally listed fairy shrimp species were performed within the Project Area and includes a 100-foot survey buffer. All topographically appropriate areas that appeared likely to support vernal pools were mapped using the Collector Application for ArcGIS and an EOS Arrow Lite GPS receiver, if observed during project surveys.

1.2 Background

The Project consists of the construction of a new, permanent Fire Rescue air operations facility at MYF. This facility will provide new hangar space and a concrete apron to accommodate five helicopters, parking, and shelter for a single Heli-tender and two fueling tender vehicles. The total area of new hangar space will be approximately 32,000 square feet (sf). The new hangar space includes a hangar support area for maintenance offices, overhaul, avionics and storage rooms. The new apron area will be approximately 65,000 sf of 5000 per square inch (psi) concrete. The project includes two above-ground fuel storage tanks, each with a 12,000-gallon capacity (24,000 gallons total).

The Parking Pad portion of the Project will provide a new concrete parking pad to accommodate a S-70A Firehawk. The parking pad will be 14,400 sf (120 ft x 120 ft) of 5,000 psi concrete, with a 30-ft border of 2-inch crushed rock on the north and east ends, totaling approximately 8,100 sf. The crushed rock buffer is for dust control due to rotor downwash from the Fire Rescue aircraft.

The staging area for the project will be placed on existing paved and/or disturbed area. The designed size of the staging area is approximately 4,000 sf. In addition to the hangars and concrete apron, the project will also address any damages to the existing access road, from Ponderosa Avenue, sustained from construction activities. The rehabilitation of the existing access road will include a two-inch overlay of asphalt material in any areas deemed necessary and not impact any undisturbed areas.

The total project area would be approximately 3.719 acres, and the project would result in 1.957 acres of new impervious surfaces.

In total, six features within the project foot print, and 21 features located immediately adjacent to the project location and within the 100-foot buffer, were the focus of wet season surveys during the 2018/2019 survey season (Figures 3 & 4). The results of these surveys are discussed in detail below. Wet season and dry season surveys were performed within the same area in 2017/2018. Those results are incorporated into the survey results discussed below. Features that were positively identified to be occupied in the 2017/2018 wet season were not sampled during 2018/2019 wet season surveys; visual surveys were conducted.

1.3 Species Information

San Diego fairy shrimp (*Branchinecta sandiegonensis*; SDFS) was listed as endangered by the United States Fish and Wildlife Service on February 3, 1997 (USFWS 2012) and is a Vernal Pool Habitat Conservation Plan- and MSCP-covered species. A member of the family Brachinectidae and order Anostraca, immature fairy shrimp exist in the soil of vernal pools and other non-vegetated ephemeral pools (2-12 inches in depth) in a dormant state known as a cyst until the pool is inundated with season precipitation. The juvenile fairy shrimp reach maturity within 7-14 days of rainfall filling the pool and measure approximately 16 millimeters in length with 11 pairs of legs. After mating the eggs are laid and remain as a cyst in the soil until the next inundation (Eriksen and Belk 1999). Development of the species is closely tied to water temperature and chemistry along with a host of other environmental cues. Seasonal rainfall between January and March typically triggers the hatching of fairy shrimp cysts (Simovich and Hathaway 1996).

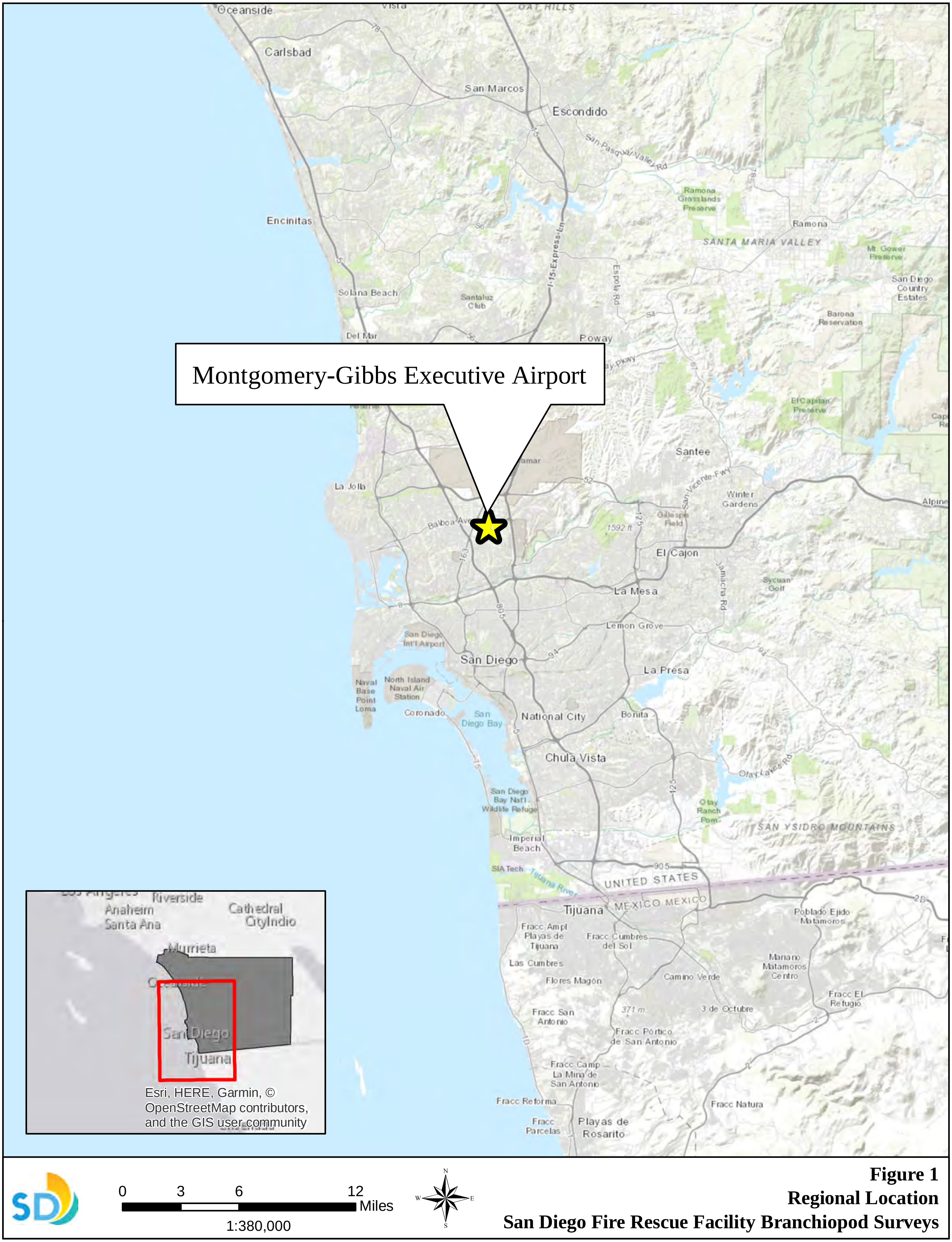


Figure 1
Regional Location
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

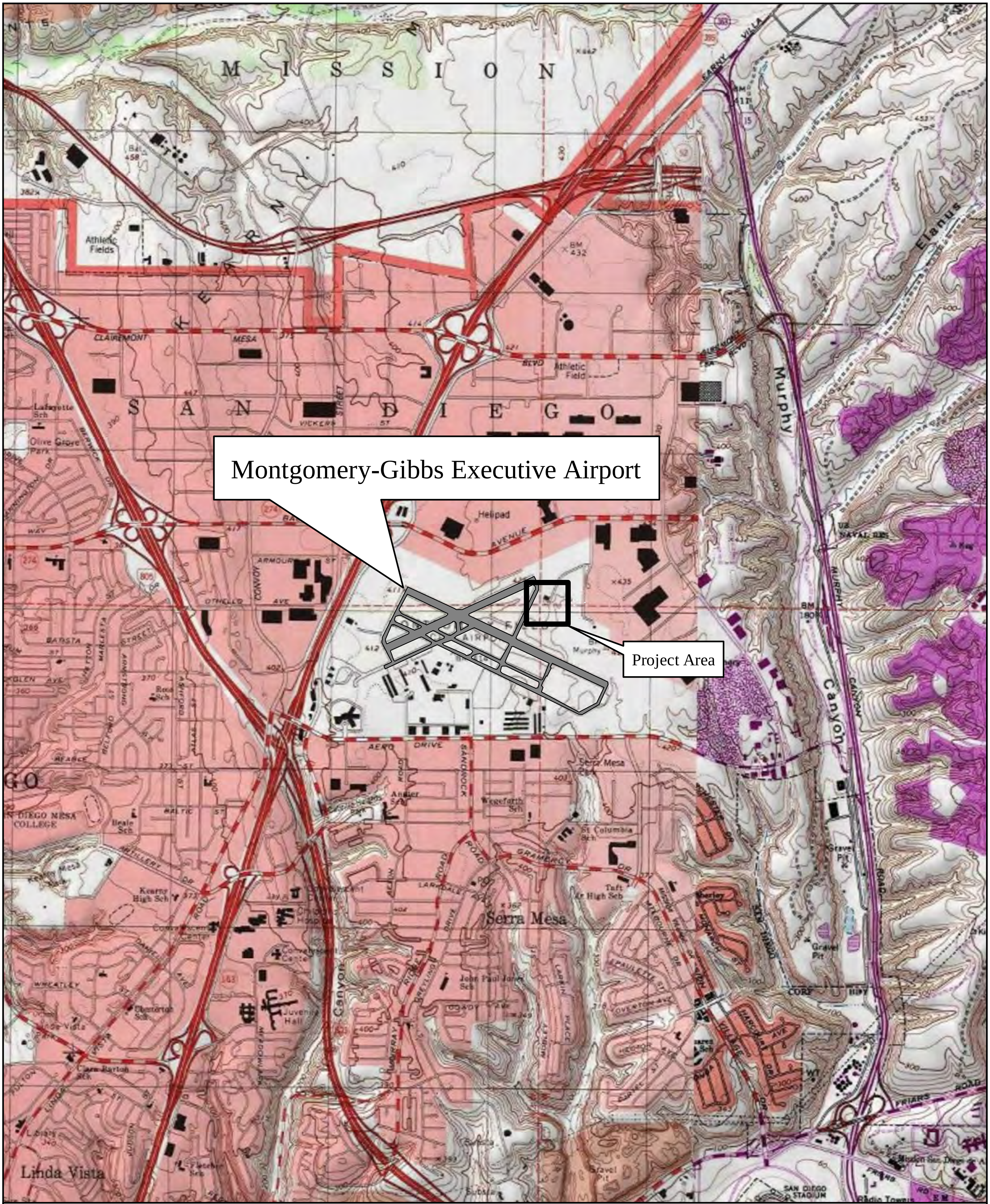


Figure 2
Project Vicinity
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

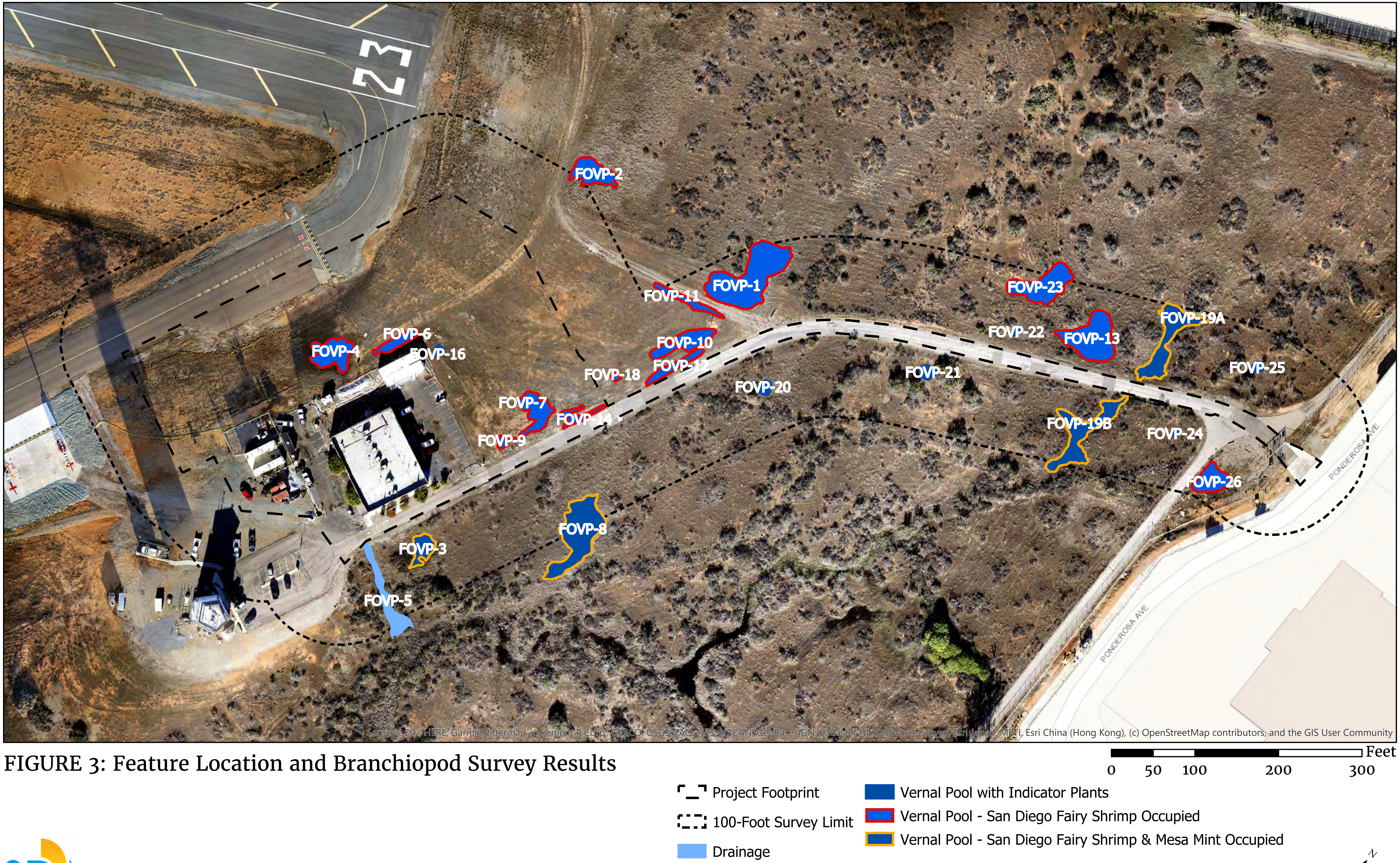


FIGURE 3: Feature Location and Branchiopod Survey Results

SD Public Works

This page intentionally left blank

2.0 METHODS

All fairy shrimp surveys were conducted in accordance with the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015). Prior to initiating the surveys, pre-notification letters were sent to the U.S. Fish and Wildlife Service-Carlsbad Field Office requesting permission to conduct protocol wet season surveys for the presence of listed fairy shrimp. When FWS permission was granted, permitted biologist Doug Allen (TE-837448-7) conducted wet season surveys, assisted by biologist, Sean Paver.

Table 1. 2018/2019 Precipitation Data (NWS 2019)

Rain Event Date	Precipitation Total (inches)
November 22, 2018	0.01
November 28, 2018	0.01
November 29, 2018	0.97
November 30, 2018	0.05
December 1, 2018	0.01
December 5, 2018	0.69
December 6, 2018	1.71
December 10, 2018	0.69
December 24, 2018	0.02
December 25, 2018	0.19
December 31, 2018	0.07
January 5, 2019	0.15
January 6, 2019	0.29
January 12, 2019	0.44
January 14, 2019	0.45
January 15, 2019	0.25
January 16, 2019	0.12
January 17, 2019	0.27
February 1, 2019	0.54
February 2, 2019	0.03
February 3, 2019	0.91

Rain Event Date	Precipitation Total (inches)
February 4, 2019	0.07
February 5, 2019	0.81
February 6, 2019	0.12
February 10, 2019	0.06
February 14, 2019	0.75
February 15, 2019	1.14
February 16, 2019	0.05
February 17, 2019	0.04
February 18, 2019	0.07
February 19, 2019	0.03
February 21, 2019	0.2
February 22, 2019	0.23
March 3, 2019	0.22
March 5, 2019	0.02
March 6, 2019	0.04
March 7, 2019	0.1
March 9, 2019	0.04
March 12, 2019	0.37
March 13, 2019	0.05
March 21, 2019	0.05
March 22, 2019	0.21
TOTAL	**12.54**

*Weather Conditions For: San Diego,Montgomery Field, CA. KMYF (NWS/FAA-SGX)

The 2018/2019 wet season protocol fairy shrimp surveys were conducted at the 27 features, identified within the project footprint and 100-foot buffer (Figures 3 & 4), to identify which features currently support listed fairy shrimp species. During the wet season surveys, the features were examined for live fairy shrimp, and if observed, shrimp were collected and identified to species level. If the presence of a listed species was confirmed, no additional sampling occurred for that feature. The field surveys commenced in November 2018 and were considered complete in March 2019. Table 1 provides the sampling visits and associated activities. Below are brief descriptions of the wet season survey methods.

Table 2. 2018/2019 Sampling Visits for the Fire Rescue Air Operations Fairy Shrimp Surveys

Date	Survey Number	Activity
November 30, 2018	1	Checked for ponding after rain event; ponding observed
December 3, 2018	2	Checked to see if ponding still present; some ponding remaining
December 4, 2018	3	Checked to see if ponding still present; no ponding observed
December 7, 2018	4	Checked for ponding after rain event.
December 11, 2018	5	Checked for ponding after rain event. GPS pools.
December 14, 2018	6	Sampled inundated features.
December 20, 2018	7	Checked to see if ponding still present; ponding observed
December 21, 2018	8	Sampled inundated features.
December 26, 2018	9	Checked for ponding after rain event; ponding observed
December 28, 2018	10	Sampled inundated features.
December 31, 2018	11	Checked to see if ponding still present; no ponding observed
January 8, 2019	12	Checked for ponding after rain event; ponding observed
January 13, 2019	13	Checked for ponding after rain event; ponding observed
January 14, 2019	14	Sampled inundated features.
January 18, 2019	15	Checked for ponding after rain event.
January 20, 2019	16	Sampled inundated features.
January 21, 2019	17	Sampled inundated features.
January 25, 2019	18	Checked to see if ponding still present; no ponding observed
February 5, 2019	19	Checked for ponding after rain event; ponding observed
February 12, 2019	20	Sampled inundated features.
February 19, 2019	21	Checked for ponding after rain event; ponding observed
February 26, 2019	22	Sampled inundated features.
March 5, 2019	23	Checked to see if ponding still present; some ponding remaining
March 12, 2019	24	Checked for ponding after rain event; ponding observed
March 20, 2019	25	Checked to see if ponding still present; some ponding remaining
March 29, 2019	26	Checked to see if ponding still present; no ponding observed

2.1 Wet Season Surveys

Wet season sampling commenced after the first significant rainfall of the 2018/2019 rainfall season on November 29, 2018 (Table 1). The biologists visited pools after storm events of at least one third of an inch to document when a pool was inundated (held more than 3 centimeters of standing water). Early site visits assessed the water levels within the features to determine when they were inundated. After inundation, pools were visited once every week until the pools were no longer inundated. The purpose of these site visits was to assess the growth of fairy shrimp, as well as to evaluate if pools that had become dry were refilling after late season rain events. Surveys were reinitiated if pools refilled to above 3 cm. During each visit, portions of the pool bottom, edges and the vertical water column were sampled using a seine, dip net or aquarium net appropriate for the size of the pool. Mesh size was no larger than 1/8 inch. Sampling tools were examined and emptied at each feature. Voucher specimens of all listed vernal pool branchiopods captured, if present, were collected and all other specimens were returned to the pool.

Voucher specimens were collected only once for each individual features or feature sampled during a single wet season. No more than 20 specimens or less than 50% of the estimated population present in the water column were collected from each individual feature for feature during the 2018/2019 wet season survey. Voucher specimens were identified to species level using a dissecting microscope (AmScope SM-2BT, 0.7-4.5X). Voucher specimens were stored in screw-cap glass vials containing 90% ethyl alcohol. These species will be submitted to an FWS approved institution. If a federally-listed fairy shrimp was recovered from any of the features during the wet season sampling, the fairy shrimp survey for that feature was considered completed under the protocol guidelines.

3.0 RESULTS

Twenty-five of the 27 features surveyed during the 2018/2019 wet seasons were vernal pools with the indicator plant species (USACE 1997) wooly marbles (*Psilocarphus brevissimus*) present. Feature FOVP-5 is a drainage/swale that carries storm water runoff from the existing fire rescue operations facility into a jurisdictional drainage that flows roughly north to south, within the Diegan coastal sage scrub, approximately 149 ft east of the existing fire rescue air operations facility (Figure 3). Feature FOVP-5 did not have any vernal pool indicator plant species present during the surveys. Feature FOVP-17 was a shallow depression (less than 2 cm) that retained water after a large rain event, but dried out quickly. This feature did not contain any vernal pool indicator species and was not observed again in the survey period. Survey area photographs are provided in Appendix A. Below are the results for the 2018/2019 wet and dry season surveys. Results from the 2017/2018 wet and dry season surveys are incorporated into the result and those pools were not sampled during the 2018/2019 wet season.

3.1 Wet Season Surveys

All 27 surveying features remained inundated for at least one surveying event. After surveying 27 features, 19 of the 27 features were observed as being occupied by SDFS (Figure 3). SDFS were not detected in FOVP-16, FOVP-17, FOVP-20, FOVP-21, FOVP-22, FOVP-24, and FOVP-25; these features only held water long enough to be sampled one time. A summary of feature sampling is provided in Table 3.

Table 3. Summary of 2017-2019 Wet Season Fairy Shrimp Survey Results

Feature Number	Type of Feature	Fairy Shrimp Species	Estimated Number of individuals	Additional Notes
FOVP-1	Pool	SDFS	>10,000	SDFS detected during the2017/2018 wet season. No more sampling occurred. SDFS visually observed during 2018/2019 wet season.
FOVP-2	Pool	SDFS	10-100	SDFS detected during the 2017/2018 wet season. No more sampling occurred. SDFS visually observed during 2018/2019 wet season.
FOVP-3	Pool	SDFS	0-10	SDFS detected during the 2017/2018 wet season. No more sampling occurred. SDFS visually observed during 2018/2019 wet season.
FOVP-4	Pool	SDFS	1-10	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-5	Swale	None	N/A	No fairy shrimp detected during wet season surveys.

Feature Number	Type of Feature	Fairy Shrimp Species	Estimated Number of individuals	Additional Notes
FOVP-6	Pool	SDFS	10-100	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-7	Pool	SDFS	10-100x	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-8	Pool	SDFS	100-1000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-9	Pool	SDFS	10-100	Cyst were detected during 2018 dry season sampling. No shrimp detected during wet season sampling. Cyst assumed to be SDFS.
FOVP-10	Pool	SDFS	100-1000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-11	Pool	SDFS	10-100	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-12	Pool	SDFS	100-1000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-13	Pool	SDFS	1000-5000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-14	Pool	SDFS	100-1000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-15	Pool	-	-	Merged with FOVP 14.
FOVP-16	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-17	-	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-18	Pool	SDFS	1000-5000	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-19A	Pool	SDFS	100-1000X	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-19B	Pool	SDFS	100-1000X	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-20	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-21	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-22	Pool	None	N/A	No fairy shrimp detected during wet season surveys.

Feature Number	Type of Feature	Fairy Shrimp Species	Estimated Number of individuals	Additional Notes
FOVP-23	Pool	SDFS	10-100	SDFS detected during the 2018/2019 wet season. No more sampling occurred.
FOVP-24	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-25	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-26	Pool	SDFS	1000X	SDFS detected during the 2018/2019 wet season. No more sampling occurred.

*N/A - Not Applicable

4.0 DISCUSSION

SDFS 2017/2018 wet and dry season surveys and 2018/2019 wet season surveys resulted in the detection of SDFS in 19 of 27 features found within the survey area. The proposed project will directly impact 6 features, 5 of which were identified to be occupied by SDFS. An additional 14 features occupied by SDFS were found adjacent to the project area. To prevent possible indirect impacts to these adjacent features, implementation of mitigation measures consistent with the City's VPHCP will be required.

5.0 CERTIFICATION

I certify that the information in this survey report and attached exhibits fully and accurately represent our work.

Doug Allen, Environmental Biologist III
(Permit No. TE-837488-7)

6.0 REFERENCES

City of San Diego

1997. *City of San Diego MSCP Subarea Plan*.

2017. *City of San Diego Vernal Pool Habitat Conservation Plan*.

Eriksen, C. and Belk, D. 1999. Fairy Shrimps of California's Puddles, Pools and Playas. Mad River Press, Eureka, California.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency.

National Weather Service (NWS) Forecast. 2019. Weather Conditions for: San Diego, Montgomery Field, CA. KMYS (NWS/FAA-SGX). Available at https://www.wrh.noaa.gov/mesowest/getobext.php?wfo=sgx&sid=KMYF&num=48

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. March 2008. *Draft Vegetation Communities of San Diego County*. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California", Robert F. Holland, Ph.D., October 1986.

Simovich, M.A. and Hathaway, S.A. 1996. Diversified Bet-Hedging as a Reproductive Strategy of Some Ephemeral Pool Anostracans. Journal of Crustaceans Biology 17: 38-44.

U.S. Army Corps of Engineers (USACE). 1997. Indicator Species for Vernal Pools. November.

U.S. Fish and Wildlife Service

2012. Endangered and Threatened Wildlife and Plants; 5-Year Reviews of Species in California and Nevada. Federal Register. Vol. 77, No. 82. Available at https://www.gpo.gov/fdsys/pkg/FR-2012-04-27/pdf/2012-10212.pdf

2015. *Survey Guidelines for the Listed Large Branchiopods*. Sacramento,

APPENDIX A

2018/2019 Photo Log

This page intentionally left blank

APPENDIX A
2018/2019 PHOTOS

FOVP-1

	11/30/2018
	12/7/2018

2/12/2019

11/30/2018

	12/7/2018
	2/12/2019

FOVP-3

	11/30/2018
	2/5/2019

	2/19/2019
	3/29/2019

FOVP-4

	11/30/2018
	12/7/2019

	2/12/2019
	3/29/2019

	11/30/2018
	12/7/2019

	2/12/2019
	3/29/2019

FOVP-5 (Swale)

	6/25/2018
	1/8/2019

	2/19/2019
	3/29/2019

FOVP-6

	8/24/2018
	11/30/2018

	12/7/2018
	2/12/2019

	3/29/2019
	1/13/2019

	2/19/2019
	2/26/2019 In Vault Box

	2/26/2019

FOVP-7, FOVP-9, FOVP-14, FOVP-18

	11/30/2018
	12/7/2018

	12/11/2018
	2/12/2019

	3/29/2019
	12/14/2018 FOVP-14 100-1000

FOVP-8

	11/30/2018
	12/11/2018

	12/21/2018
	3/29/2019

FOVP-10, FOVP-11, FOVP-12

	11/30/2018 FOVP-10 FOVP-12
	12/7/2018 FOVP-10 FOVP-12

	12/11/2018 FOVP-10 FOVP-12
	3/29/2019 FOVP-10 FOVP-12

	12/11/2018 FOVP-10 FOVP-11 FOVP-1
	12/14/2018 FOVP-10 FOVP-11 FOVP-1

	2/12/2019 FOVP-10 FOVP-11 FOVP-1
	3/29/2019 FOVP-10 FOVP-11 FOVP-1

FOVP-13

	12/11/2018
	2/26/2019

	3/29/2019

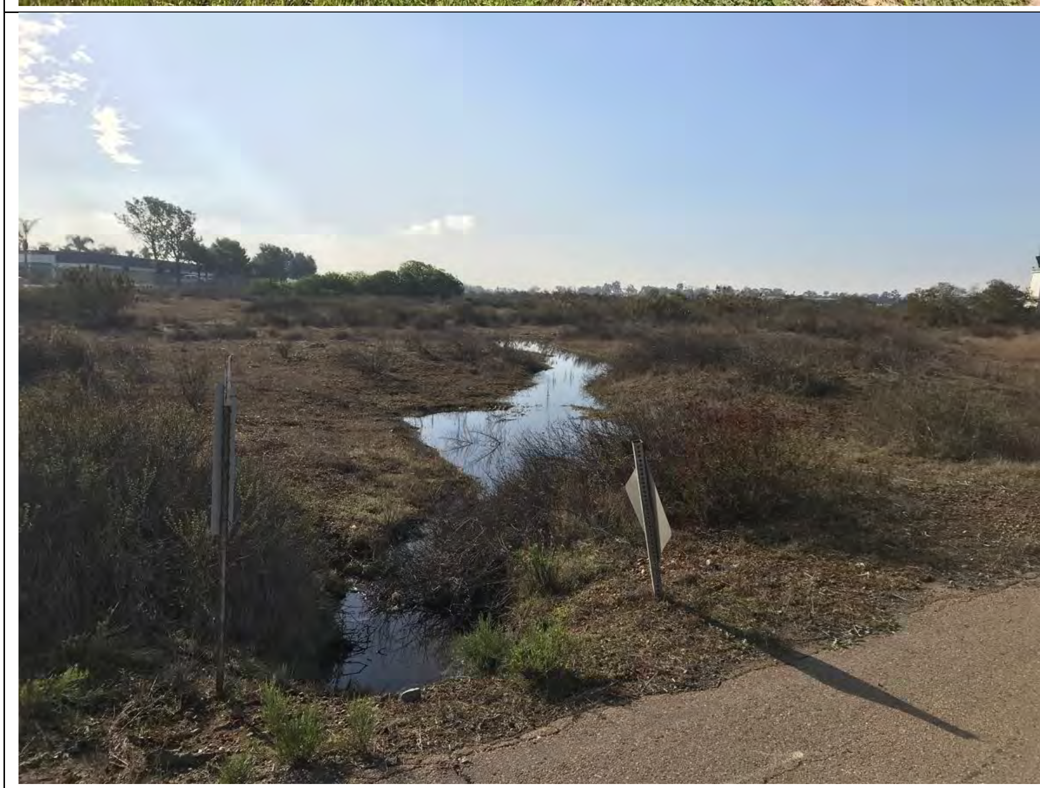
FOVP-16

	12/8/2018
	12/11/2018

	2/12/2019
	3/20/2019

FOVP-19A & FOVP-19B

	12/11/2018 FOVP-19A
	2/26/2019 FOVP-19A

	3/29/2019 FOVP-19A
	12/11/2019 FOVP-19B

	2/26/2019 FOVP-19B
	3/29/2019 FOVP-19B

FOVP-21

	1/18/2019
	3/29/2019

FOVP-22

	2/26/2019
	3/5/2019

FOVP-23

	2/26/2019
	3/29/2019

FOVP-24

	2/26/2019
	3/5/2019

FOVP-25

	2/26/2019
	3/5/2019

FOVP-26

	2/26/2019
	3/5/2019

APPENDIX B

Sample Survey Data

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire Air Ops PL II **County:** San Diego **Quad:** Township: Range: Section:

SURVEYOR / Permit Number: DOUG; CINDY; SEAN

Date: 12/14/18 Time: 13:00 Weather Conditions: Mostly Claudy

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP6		68°F	61°F	4"	6"	8 sq ft													Com Box - NONE
FOVP7		68°F	63°F	1/4"	1/2"	15 sq ft													1000 - 5000 Approx
FOVP10		68°F	62°F	1.5"	2"	21'x10'													1000X
FOVP 8		68°F	63°F	8"-10"	12"														1000X

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire Ops Phase II **County:** San Diego **Quad:** Township: Range: Section:

SURVEYOR / Permit Number: Doug, Cindy, Sean

Date: 12/21/18 Time: 9:35 Weather Conditions: 56°F, 100% cc, ~~[illegible]~~ 1-2 mph gust at 3-4

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth ~~(cm)~~ in		Surface Area ~~(m x m)~~ (ft x ft)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP-8		56°	57°	2in	4in	60x40											X	stinkwort	SDFS present 1000 X
																			↑ more than
																			last week

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire Op II	County: SD	Quad:	Township:	Range:	Section:

SURVEYOR / Permit Number: Doug Allen

Date: 12/28 | Time: 10:11 | Weather Conditions: Ø% cc, 1-4 mph 62°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (F) Air F	Temp (F) Water F	Depth (in) Average	Depth (in) Est. Max.	Surface Area (ft) Present	Surface Area (ft) Est. Max.	Crustaceans: Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Insects: Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae	Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information utility box
FOVP-6		62°	54°	2		2×4													
FOVP-4		62°	58°	tire 5-6 cut		39×30												3 days after rain	filled on 12/25 no sign of shrimp

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: MYE-FIRE-OPS | County: SD | Quad: | Township: | Range: | Section:

SURVEYOR / Permit Number: DOUG ALLEN / SEAN PAUGE

Date: 1/14/19 | Time: 9:30am | Weather Conditions: Cloudy-light rain - 59°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F) Air	Temp (°F) Water	Depth (cm) Average	Depth (cm) Est. Max.	Surface Area Ft (m x m) Ft Present	Surface Area Est. Max.	Crustaceans: Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Insects: Coleoptera	Hemiptera	Diptera Culicidae LAR/AE	Diptera Chironomidae	Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
FOVP-4		59	52	6	8	12x54		BRSA										D	SDFS 1-10; Pulled 1 for ID
FOVP-6		59	53	2.5	6	50x10									X			D	Comm.: Box-3-Feet Deep

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool: UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed: G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: MYF - Ricions	County: SAN DIEGO	Quad:	Township:	Range:	Section:
SURVEYOR / Permit Number: Doug; SEAN; CINDY					
Date: 23 JAN 19	Time: 9:30 am	Weather Conditions: Cloud Cover 40%; 60°F wind 0-10			

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP-16		60°F	59°F	<3cm	4cm	7'x13'				X	X								
FOVP-17		58°F	62°F	1cm	1.5cm	30'x18'													
FOVP-9		63°F	61°F	3.5cm	4.5cm	25'x11'				X									Connected to FOVP-7
FOVP-7		65°F	61°F	4cm	5.5cm	45'x50'		BRSD		X									10-100X
FOVP-14/15		66°F	61°F	3cm	4cm	66'x32'		BRSD		X									100X - overlapping BD
FOVP-19		68°F	62°F	3cm	4cm	33'x52'		BRSD		X									10-100X
FOVP-12		64°F	63°F	3cm	4cm	85'x15'		BRSD		X	X								100X
FOVP-10																			Visual - SHRIMP Observed
FOVP-11		72°F	64°F	3cm	4cm	85'x3'				X	X								
FOVP 12		74°F	63°F	15cm	25cm	200'x40'		BRSD		X	X						X		Culvert connects 100-1000X
FOVP-13		74°F	63°F	5cm	12cm	30x60		BRSD											100X
FOVP-4		75°F	71°F	3.5cm	7cm	68'x12'		BRSD		X	X								1/10

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: MYF-FIRE	County: SD	Quad:	Township:	Range:	Section:

SURVEYOR / Permit Number: Sean + Doug

Date: 11 Jan 19	Time: 4:00 pm	Weather Conditions: Partly Cloudy ~25% 57°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP 6		57F	52F	2.5cm	4cm	6x20'		[illegible]		X									1-10; Pulled 1 from BxY BxX 3 ft deep

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep: AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire OPS - MYF | **County:** San Diego | **Quad:** | Township: | Range: | Section:

SURVEYOR / Permit Number: SEAN / DAVG

Date: 26 FEB 19 | **Time:** 7:15am | **Weather Conditions:** Partly cloudy/HAZE (40%) 46°F WIND 0-5mph

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP-9		46°F	49°F	.5cm	1cm	1x1'									X LARVAE				
FOVP-20		49°F	51°F	2.5cm	5cm	10x10'				X									
FOVP-21		49°F	52°F	2.5cm	6cm	10'x10'				X									
FOVP-22		50°F	51°F	2.5cm	6cm	10'x4'				X									
FOVP-23		52°F	56°F	6cm	12cm	80'x20'		[illegible]		X									10-100
FOVP-24		54°F	56°F	1cm	3cm	3'x6'													
FOVP-25		55°F	54°F	2cm	5cm	12'x12'													
FOVP-26		55°F	56°F	5cm	12cm	40'x30'		[illegible]		X									1000-5000

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Hangers and Helicopter Parking Pad Project, San Diego, California

Fairy Shrimp Surveys: 2017/2018 Wet and Dry Season Survey Report

WGS # S-18007

September 2018

Prepared for:

City of San Diego

Prepared by:

Real Estate Assets Department

Airports Division

3750 John J. Montgomery Drive

San Diego, Ca 92123

858.573.1446

Prepared By: ______________________________

Cindy Dunn, Environmental Biologist III

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

The City of San Diego is proposing to construct a new, permanent Fire Rescue Air Operations Facility (Project) at Montgomery-Gibbs Executive Airport (MYF). The facility will accommodate the emergency helicopters for the crews that will provide 24 hour on-call services 365 days per year. The project area would be approximately 3.035 acres, and the project would result in 1.99 acres of new impervious surfaces, including the hangars, fueling stations, heli-tender storage buildings, concrete aprons, ramps, vehicle parking, and a helicopter parking pad to accommodate a S-70A Firehawk. The proposed project is located completely within the existing the active MYF airfield and is outside of, but adjacent to the City's Multi-Habitat Planning Area (MHPA) boundary.

The purpose of the surveys was to determine the current status and location of listed fairy shrimp. The areas where the surveys were performed include nine basins with the potential to support standing water, which would provide potential habitat for fairy shrimp. Previous surveys of MYF have documented the presence of the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*; SDFS). This report presents the results of the 2017/2018 wet and dry season surveys.

SDFS were detected in three of the nine basins during the wet season sampling. Only *Branchinecta* sp. fairy shrimp cysts were detected in two more basins during the dry season sampling. The remaining four basins did not have cysts present.

This page intentionally left blank

1.0 INTRODUCTION

This report presents the findings of the wet and dry season fairy shrimp survey conducted for the Montgomery-Gibbs Executive (MYF) Airport Fire Rescue Air Operations Facility Hangers and Helicopter Parking Pad Project (Project), located in the City of San Diego, California (Figure 1 and 2).

U.S. Fish and Wildlife (FWS) protocol fairy shrimp surveys were conducted to determine the current status of listed fairy shrimp in nine basins located within and immediately adjacent to the proposed Project. These basins had been reported as having the potential to support standing water, potential habitat for fairy shrimp. This report presents the results of the 2017/2018 wet and dry season surveys for the nine basins.

1.1 Project Area

The Project is located on MYF, immediately east of State Route 163 (SR-163), north of Aero Drive, and South of Balboa Avenue, in the Kearny Mesa Community Planning Area (Council District 6) (City of San Diego 1997). Within the airfield the Project site is located, northern of runways 28R, east of Taxiway C, and north of the air traffic control tower (Figure 3). The project is located adjacent to the City of San Diego Multiple Habitat Planning Area (MHPA) (City of San Diego 1997). The topography of the survey area is relatively flat. It is developed with the current Fire-Rescue Air Operations, associated buildings, and parking areas. Areas of undeveloped land occur between Taxiway Charlie, and the existing air operations structures, within the project footprint (Figure 3). Vegetation communities documented within the vicinity of the study area include non-native grassland, disturbed habitat, developed, San Diego Mesa Claypan Vernal Pools, and Diegan coastal sage scrub (Holland 1986, as modified by Oberbauer et al. 2008). A small drainage, that flows north to south, occurs approximately 149 feet (ft) east of the existing fire rescue air operations facility.

According to the City of San Diego’s Vernal Pool Habitat Conservation Plan (City of San Diego 2017) the presence of vernal pools has been recorded adjacent to the project footprint. Focused, seasonally-appropriate protocol surveys for federally listed fairy shrimp species were performed within the Project Area and includes a 100-foot buffer. All topographically appropriate areas that appeared likely to support vernal pools were mapped using the Collector Application for ArcGIS and an EOS Arrow Lite GPS receiver, if observed during project surveys.

1.2 Background

The Project consists of the construction of a new, permanent Fire Rescue air operations facility at MYF. This facility will provide new hangar space and a concrete apron to accommodate five helicopters, parking, and shelter for a single Heli-tender and two fueling tender vehicles. The total area of new hangar space will be approximately 32,000 square feet (sf). The new hangar space includes a hangar support area for maintenance offices, overhaul, avionics and storage rooms. The new apron area will be approximately 65,000 sf of 5000 per square inch (psi) concrete. The project includes two above-ground fuel storage tanks, each with a 12,000-gallon capacity (24,000 gallons total).

The Parking Pad portion of the Project will provide a new concrete parking pad to accommodate a S-70A Firehawk. The parking pad will be 14,400 sf (120 ft x 120 ft) of 5,000 psi concrete, with a 30-ft border of 2-inch crushed rock on the north and east ends, totaling approximately 8,100 sf. The crushed rock buffer is for dust control due to rotor downwash from the Fire Rescue aircraft.

The staging area for the project will be placed on existing paved and/or disturbed area. The designed size of the staging area is approximately 4,000 sf. In addition to the hangars and concrete apron, the project will also address any damages to the existing access road, from Ponderosa Avenue, sustained from construction activities. The rehabilitation of the existing access road will include a two-inch overlay of asphalt material in any areas deemed necessary and not impact any undisturbed areas.

The total project area would be approximately 3.035 acres, and the project would result in 1.99 acres of new impervious surfaces.

In total, four basins within the project foot print, and five basins located immediately adjacent to the project location and within the 100-foot buffer, were the focus of wet and dry season surveys during the 2017/2018 survey season (Figures 3 & 4). The results of these surveys are discussed in detail below.

1.3 Species Information

San Diego fairy shrimp (*Branchinecta sandiegonensis*; SDFS) was listed as endangered by the United States Fish and Wildlife Service on February 3, 1997 (USFWS 2012) and is a Vernal Pool Habitat Conservation Plan- and MSCP-covered species. A member of the family Brachinectidae and order Anostraca, immature fairy shrimp exist in the soil of vernal pools and other non-vegetated ephemeral pools (2-12 inches in depth) in a dormant state known as a cyst until the pool is inundated with season precipitation. The juvenile fairy shrimp reach maturity within 7-14 days of rainfall filling the pool and measure approximately 16 millimeters in length with 11 pairs of legs. After mating the eggs are laid and remain as a cyst in the soil until the next inundation (Eriksen and Belk 1999). Development of the species is closely tied to water temperature and chemistry along with a host of other environmental cues. Seasonal rainfall between January and March typically triggers the hatching of fairy shrimp cysts (Simovich and Hathaway 1996).

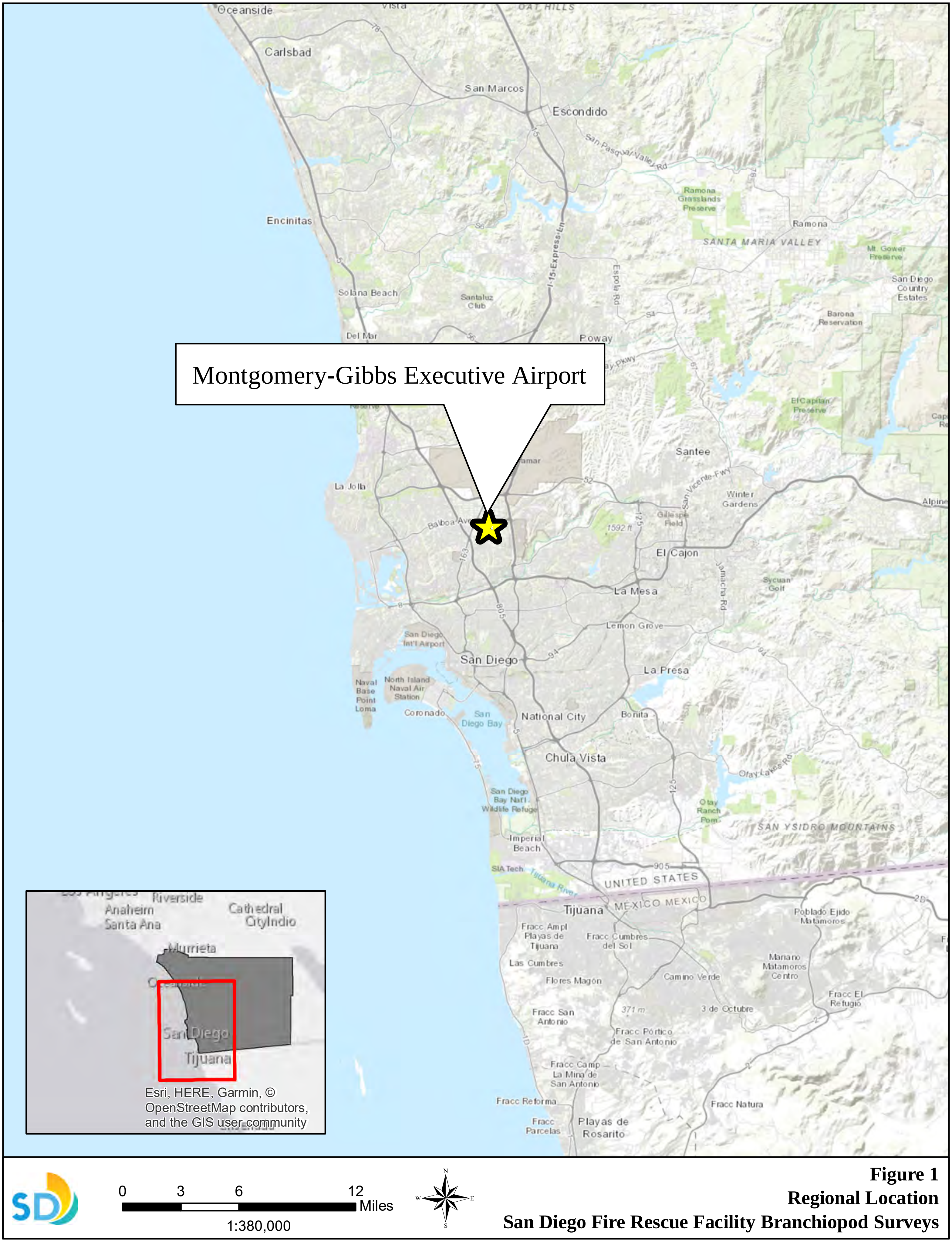


Figure 1
Regional Location
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

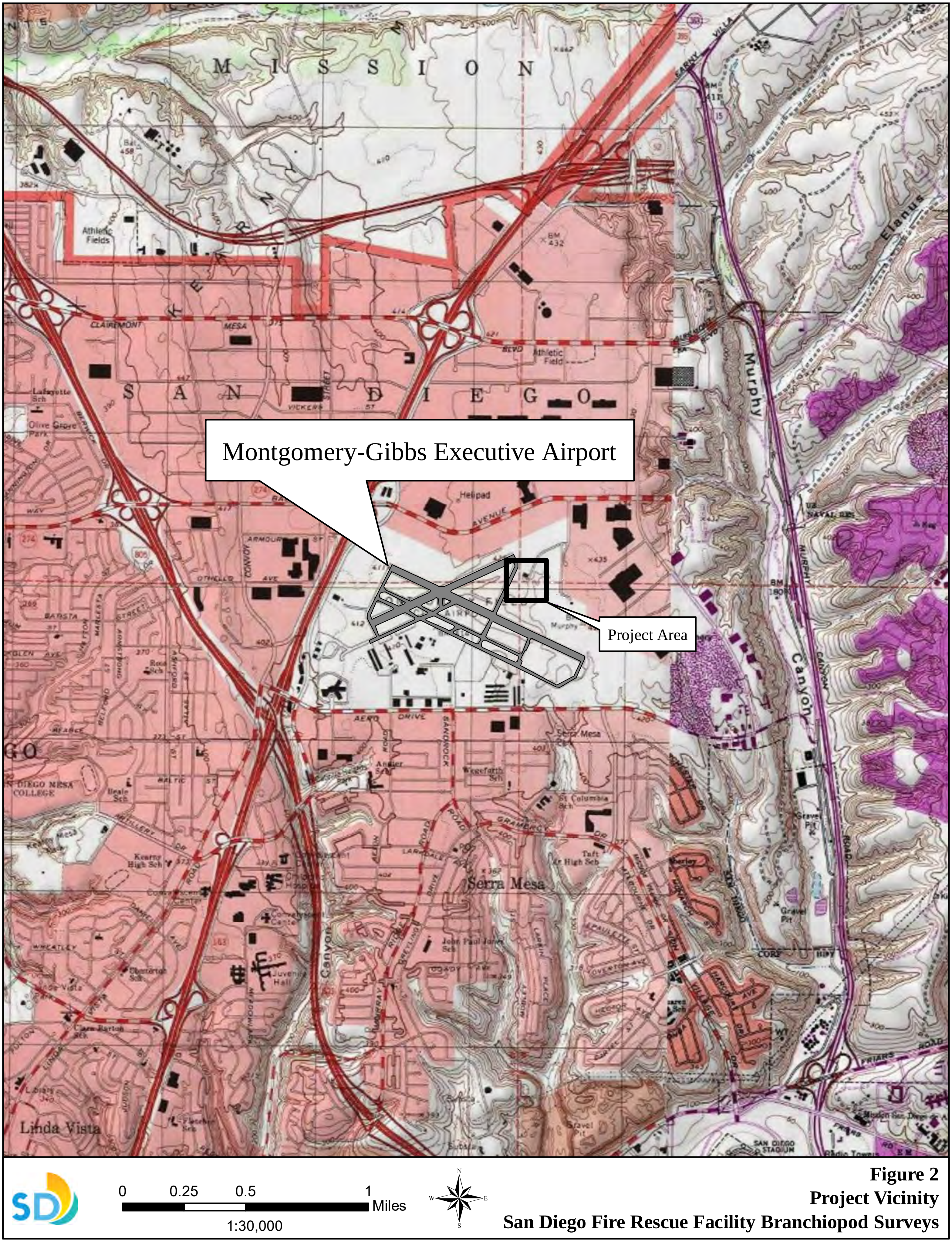


Figure 2
Project Vicinity
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

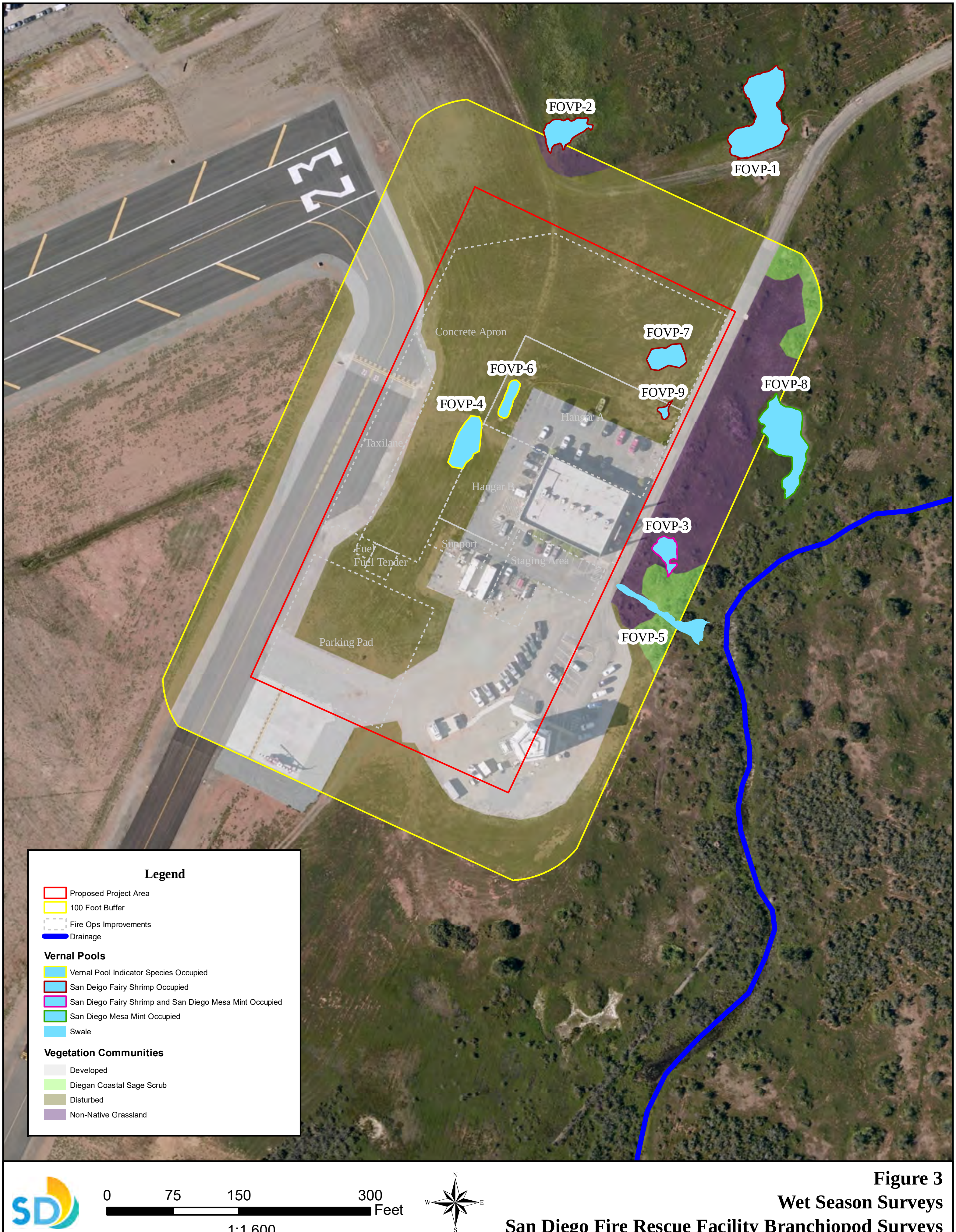


Figure 3
Wet Season Surveys
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

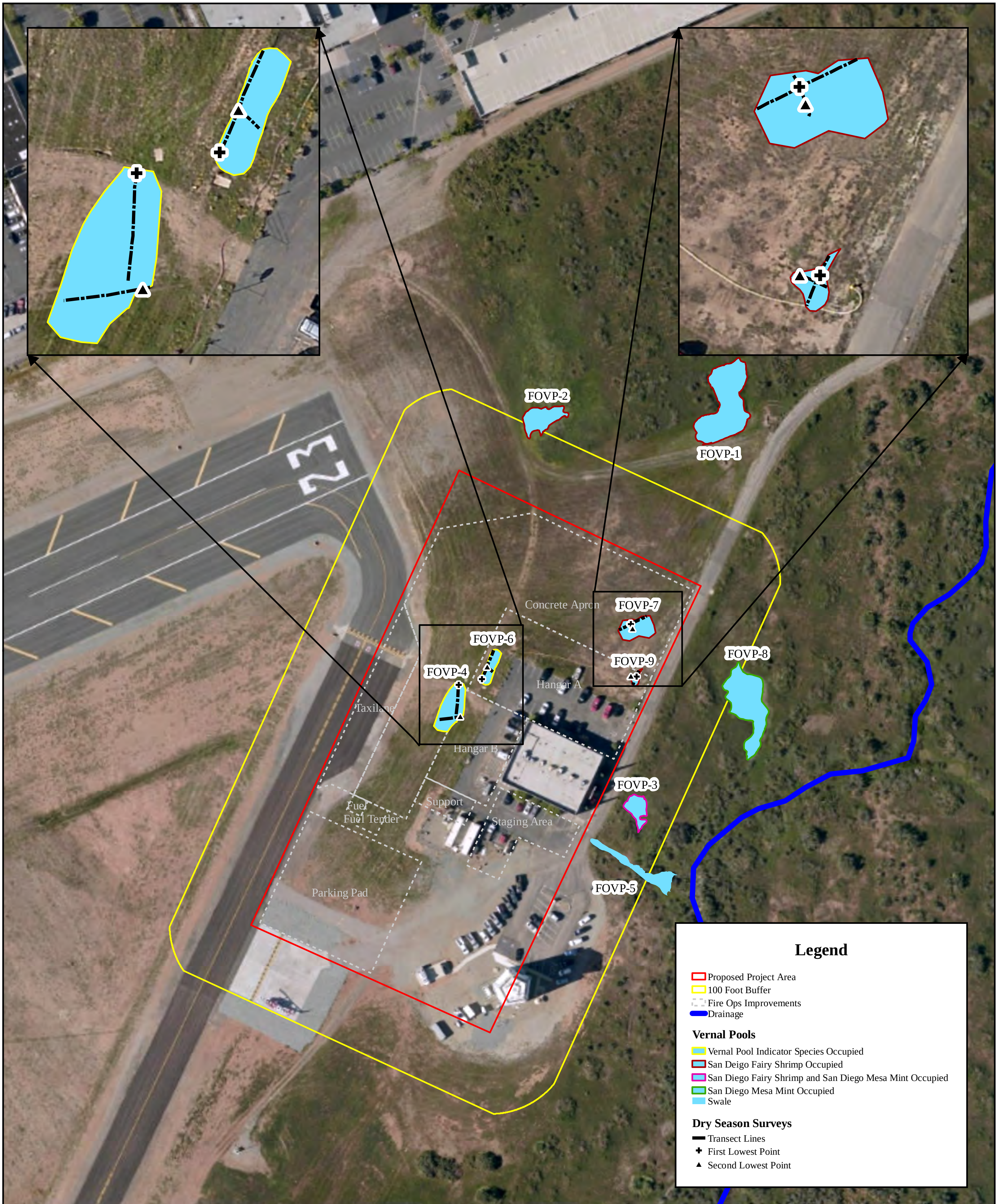


Figure 4
Dry Season Surveys
San Diego Fire Rescue Facility Branchiopod Surveys

This page intentionally left blank

2.0 METHODS

All fairy shrimp surveys were conducted in accordance with the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015). Prior to initiating the surveys, pre-notification letters were sent to the U.S. Fish and Wildlife Service-Carlsbad Field Office requesting permission to conduct protocol wet and dry season surveys for the presence of listed fairy shrimp. When FWS permission was granted, permitted biologist Doug Allen (TE-837448-7) conducted wet season and dry season soil sampling surveys, assisted by airport biologist, Cindy Dunn. Mr. Allen processed the dry season soil samples after collection.

Table 1.
2017-2018 Precipitation (NWS 2018)

Rain Event Date	Precipitation Total in inches*
11/1/2017	0.01
11/27/2017	0.01
12/20/2017	0.07
1/8/2018	0.22
1/9/2018	1.68
1/10/2018	0.04
2/13/2018	0.02
2/21/2018	0.06
2/22/2018	0.02
2/27/2018	0.36
3/3/2018	0.14
3/11/2018	0.48
3/14/2018	0.02
3/15/2018	0.16
3/17/2018	0.23
3/18/2018	0.02
3/22/2018	0.01
5/1/2018	0.02
5/2/2018	0.04
Total Rainfall	**3.61**

*Weather Conditions For: San Diego, Montgomery Field, CA. KMYF (NWS/FAA-SGX)

The 2017/2018 wet and dry season protocol fairy shrimp surveys were conducted at the nine basins, identified within the project footprint and 100-foot buffer (Figures 3 & 4), to identify which basins currently support listed fairy shrimp species. During the wet season surveys, the basins were examined for live fairy shrimp, and if observed, shrimp were collected and identified to species level. If the presence of a listed species was confirmed, no additional sampling occurred for that basin. The field surveys commenced in January 2018 and were considered complete in July 2018. Wet season surveys were conducted from January 2018 to March 2018. In July 2015, after the wet season and once soils were dry, dry season sampling was conducted. Table 1 provides the sampling visits and associated activities. Below are brief descriptions of the wet and dry season survey methods.

Table 2.
Sampling Visits for the Fire Rescue Air Operations Fairy Shrimp Surveys

Date	Survey Number	Activity
January 10, 2018	0	Checked for ponding after rain event; ponding observed.
January 17, 2018	1	Sampled inundated basins.
January 24, 2018	2	Continued to sample inundated basin.
February 28, 2018	3	Checked for ponding after rain event; ponding observed.
March 7, 2018	4	Sampled inundated basins.
March 12, 2018	5	Checked for ponding after rain event; ponding observed.
March 19, 2018	6	Sampled inundated basins.
July 11, 2018	7	Conducted dry season sampling survey.
July 16, 2018	8	Conducted dry season sampling survey.
July 23, 2018	9	Conducted dry season sampling survey.

2.1 Wet Season Surveys

Wet season sampling commenced after the first significant rainfall of the 2017/2018 rainfall season on January 9, 2018 (Table 1). The biologists visited pools after storm events of at least one third of an inch to document when a pool was inundated (held more than 3 centimeters of standing water). Early site visits assessed the water levels within the basins to determine when they were inundated. After inundation, pools were visited once every week until the pools were no longer inundated. The purpose of these site visits was to assess the growth of fairy shrimp, as well as to evaluate if pools that had become dry were refilling after late season rain events. Surveys were reinitiated if pools refilled to above 3 cm. During each visit, portions of the pool bottom, edges and the vertical water column were sampled using a seine, dip net or aquarium net appropriate for the size of the pool. Mesh size was no larger than 1/8 inch. Sampling tools were examined and emptied at each basin. Voucher specimens of all listed vernal pool branchiopods captured, if present, were collected and all other specimens were returned to the pool.

Voucher specimens were collected only once for each individual basins or feature sampled during a single wet season. No more than 20 specimens or less than 50% of the estimated population present in the water column were collected from each individual basin for feature during the 2017/2018 wet season survey. Voucher specimens were identified to species level using a dissecting microscope (AmScope SM-2BT, 0.7-4.5X). Voucher specimens were stored in screw-cap glass vials containing 90% ethyl alcohol. These species will be submitted to an FWS approved institution. If a federally-listed fairy shrimp was recovered from any of the basins during the wet season sampling, the fairy shrimp survey for that basin was considered completed under the protocol guidelines.

2.2 Dry Season Surveys

Dry season soil sampling was conducted on July 11, 2018. Of the nine basins surveyed for the 2017/2018 wet season, only those basins located directly within the proposed project footprint, that did not already produce fairy shrimp during the wet season surveys, were dry season soil sampled. Approximately 50 milliliter (ml) of dry soil was collected every meter along two transects that intersected with the two deepest points of each basin. The size and shape of the pools determine the amount of soil collected per basin (Figure 4). Samples were taken starting at the deepest portion of the basin and radiated along the transect to the edge, every meter. Each sample was stored in a separate bag and labeled with the basin identification number, date of collection, person collecting the soil sample, and the specific location within the basin from where it was taken.

Soil samples were processed per the U.S. Fish and Wildlife Service (FWS) May 31, 2015 Survey Guidelines for Listed Large Branchiopods (USFWS 2015). Doug Allen, who is authorized by the FWS to process dry samples for the presence of fairy shrimp cysts and culture cysts to identify to species level as special conditions of their 10(a)(1)(A) permits, conducted the soil processing. The dry soil samples were hydrated in filtered water and table salt (5% brine solution) for approximately 1 hour and was gently broken down by hand to reduce any persistent soil structures.

To ensure cysts would not be damaged, small aliquots (approximately 50 ml) of soil were gently washed with water through a graded series of U.S. standard eight-inch soil sieves ending in mesh sizes 300 micron (um) and 150 um. The sieves were thoroughly rinsed and visually inspected for cysts that may have adhered to the sieves for each soil sample location. Once the samples were sieved from the 300 um and 150 um sieves, they were examined under a dissecting microscope (AmScope SM-2BT, 0.7-4.5X) for the presence of cysts. This was done for each individual soil sample. Any cysts found were removed from the soil and allowed to air-dry to be stored dry. The cysts were identified to genus level. All cysts were identified as *Branchinecta* sp. No cysts were hatched as the client assumed the cysts were SDFS, which is known to occur on MYF (City of San Diego 2017) and was already identify in pool adjacent to the proposed project site.

3.0 RESULTS

The eight of the nine basins surveyed during the 2017/2018 wet and dry seasons were all vernal pools with the indicator plant species (USACE 1997) wooly marbles (*Psilocarphus brevissimus*) present. Basin FOVP-5 is a drainage/swale that carries storm water runoff from the existing fire rescue operations facility into a jurisdictional drainage that flows roughly north to south, within the Diegan coastal sage scrub, approximately 149 ft east of the existing fire rescue air operations facility (Figure 3). Basin FOVP-5 did not have any vernal pool indicator plant species present during the surveys. Survey area photographs are provided in Appendix A. Below are the results for the 2017/2018 wet and dry season surveys.

3.1 Wet Season Surveys

After surveying the nine basins, only five basins (FOVP-1, FOVP-2, FOVP-3, FOVP-4, and FOVP-5) held water long enough to sample (Figure 3). The remaining four basins (FOVP-6, FOVP-7, FOVP-8, and FOVP-9) did not hold water long enough during the wet season. SDFS were observed swimming in three of these five basins (FOVP-1, FOVP-2, FOVP-3) during wet season surveys. A summary of basin sampling is provided in Table 3.

Table 3.
Summary of Wet Season Fairy Shrimp Survey Results

Basin Number	Type of Basin	Fairy Shrimp Species	Estimated Number of individuals	Additional Notes
FOVP-1	Pool	SDFS	>10,000	SDFS detected during the wet season. No more sampling occurred.
FOVP-2	Pool	SDFS	10-100	SDFS detected during the wet season. No more sampling occurred.
FOVP-3	Pool	SDFS	0-10	SDFS detected during the wet season. No more sampling occurred.
FOVP-4	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-5	Swale	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-6	Pool	None	N/A	Did not hold water; therefore, no sampling occurred.
FOVP-7	Pool	None	N/A	No fairy shrimp detected during wet season surveys.
FOVP-8	Pool	None	N/A	Did not hold water; therefore, no sampling occurred.
FOVP-9	Pool	None	N/A	Did not hold water; therefore, no sampling occurred.

*N/A - Not Applicable

3.2 Dry Season Surveys

After sampling the four basins located specifically within the project impact area (FOVP-4, FOVP-6, FOVP-7 and FOVP-9), only two basins (FOVP-7 and FOVP-9) had only *Branchinecta* sp. cysts present. The remaining two basins (FOVP-4 and FOVP-6) did not have any fairy shrimp cysts. The City of San Diego assumes that the cysts found in FOVP-7 and FOVP-9 are of the federally endangered SDFS since that is the only species of fairy shrimp currently known to exist on MYF. To ensure the negative finding of cysts in basins FOVP-4 and FOVP-6, additional soil samples were collected on July 16 and 23, and analyzed. No cysts were found in these additional samples. A summary of the 2018 dry season sampling is provided in Table 4.

Table 4.
Summary of Dry Season Fairy Shrimp Survey Results

Basin Number	Type of Basin	Number of Sample points	Fairy Shrimp Species	Estimated Number of Cysts	Additional Notes
FOVP-4	Pool	27	N/A	N/A	No cysts were present.
FOVP-5	Swale	N/A	N/A	N/A	This swale exists well outside of the project footprint and will not be impacted by construction activities. To avoid unnecessarily impacted a listed species this swale was not sampled.
FOVP-6	Pool	25	N/A	N/A	No cysts were present.
FOVP-7	Pool	11	SDFS	26	Cysts were present during dry season sampling. It is assumed that they are SDFS, therefore cysts were not hatched.
FOVP-8	Pool	N/A	N/A	N/A	This pool exists well outside of the project footprint and will not be impacted by construction activities. To avoid unnecessarily impacted a listed species this pool was not sampled.
FOVP-9	Pool	8	SDFS	14	Cysts were present during dry season sampling. It is assumed that they are SDFS, therefore cysts were not hatched.

*N/A = Not Applicable

4.0 DISCUSSION

SDFS were detected during wet season sampling in three of the nine basins. *Branchinecta* sp. fairy shrimp cysts were detected in two additional basins during dry season sampling. The City of San Diego will assume that any cysts found during these surveys are the endangered SDFS, as this is historically the only fairy species known to occur on MYF. The remaining four basins did not have cysts present. Below are discussions of the wet and dry season surveys.

Wet Season Surveys
Four basins (FOVP-1, FOVP-2, FOVP-3, FOVP-4) became inundated during the wet season. Early in the wet season, FOVP-1, FOVP-2, and FOVP-3 were sampled once on January 10, 2018. The following week FOVP-1 remained inundated and was sampled a second time on January 17, 2018. FOVP-4 and FOVP-5 were sampled after on March 12, 2018. SDFS were documented in basins FOVP-1, FOVP-2, and FOVP-3.

Dry Season Surveys
Dry season surveys followed the wet season surveys. Basins FOVP-7 and FOVP-9 had cysts present; Basins FOVP-4 and FOVP-6 did not have cysts present. Basins FOVP-5 and FOVP-8 were not surveyed during the dry season because these basins were located within the buffer of the impact area and would not be directly impacted by construction activities. To prevent possible indirect impacts to basins FOVP-5 and FOVP-8 will be mitigated through the use of BMPs, orange construction fencing, and biological monitoring during construction.

5.0 CERTIFICATION

I certify that the information in this survey report and attached exhibits fully and accurately represent our work.

Doug Allen, Environmental Biologist III
(Permit No. TE-837488-7)

6.0 REFERENCES

City of San Diego

1997. *City of San Diego MSCP Subarea Plan*.

2017. *City of San Diego Vernal Pool Habitat Conservation Plan*.

Eriksen, C. and Belk, D. 1999. Fairy Shrimps of California's Puddles, Pools and Playas. Mad River Press, Eureka, California.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency.

National Weather Service (NWS) Forecast. 2018. Weather Conditions for: San Diego, Montgomery Field, CA. KMYS (NWS/FAA-SGX). Available at https://www.wrh.noaa.gov/mesowest/getobext.php?wfo=sgx&sid=KMYF&num=48

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. March 2008. *Draft Vegetation Communities of San Diego County*. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California", Robert F. Holland, Ph.D., October 1986.

Simovich, M.A. and Hathaway, S.A. 1996. Diversified Bet-Hedging as a Reproductive Strategy of Some Ephemeral Pool Anostracans. Journal of Crustaceans Biology 17: 38-44.

U.S. Army Corps of Engineers (USACE). 1997. Indicator Species for Vernal Pools. November.

U.S. Fish and Wildlife Service

2012. Endangered and Threatened Wildlife and Plants; 5-Year Reviews of Species in California and Nevada. Federal Register. Vol. 77, No. 82. Available at https://www.gpo.gov/fdsys/pkg/FR-2012-04-27/pdf/2012-10212.pdf

2015. *Survey Guidelines for the Listed Large Branchiopods*. Sacramento, CA.

APPENDIX A

2018 Photo Log

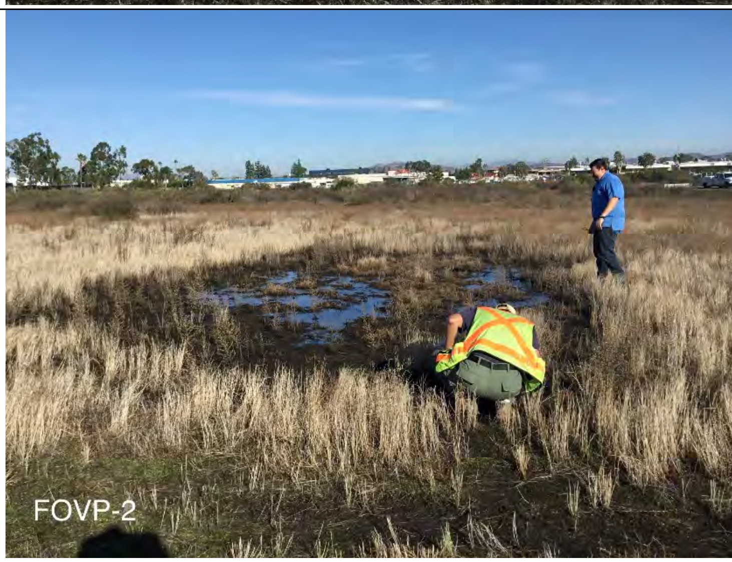
	Photo 1 Basin FOVP-1 Facing West Photographer: C. Dunn January 17, 2018
	Photo 2 Basin FOVP-2 Facing Northeast Photographer: C. Dunn January 17, 2018
	Photo 3 Basin FOVP-3 Facing Northeast Photographer: C. Dunn January 17, 2018

	Photo 4 Basin FOVP-4 Facing Northwest Photographer: C. Dunn March 19, 2018
	Photo 5 Basin FOVP-5 Facing Northwest Photographer: C. Dunn March 19, 2018

	Photo 6 Basin FOVP-6 Facing Southwest Photographer: C. Dunn August 24, 2018
	Photo 7 Basin FOVP-7 Facing Northeast Photographer: C. Dunn August 24, 2018
	Photo 8 Basin FOVP-9 Facing Northeast Photographer: C. Dunn August 24, 2018

APPENDIX B

Survey Sampling Data

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods					
Site or Project Name: Fire Ops Facility	County: San Diego	Quad:	Township:	Range:	Section:
SURVEYOR / Permit Number: Doug Allen					
Date: 1/17/18	Time: 1410	Weather Conditions: 77°F, High haze, 45% cc, 2-5 mph			

Feature ID #	UTM (Northing, Easting, Datum)	Temp (~~°C~~) °F		Depth (cm)		Surface Area ft (~~m x m~~)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP - 1		77	77	7.5	20	75x86	150x100											dark pool	film on surface >100 FS Present/collected
FOVP - 2		68	75	5	10	15x20	30x40												10-100 FS present/collected
FOVP - 3		71	77	5	15	18x22	25x40												0-10 FS present/collected

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli)*.
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire Ops facility	County:	Quad:	Township:	Range:	Section:

SURVEYOR / Permit Number: Doug Allen

Date: 1/24/18	Time: 1130	Weather Conditions: 87°, 10% cc, 2-4 mph

Feature ID #	UTM (Northing, Easting, Datum)	Temp ~~(°C)~~ °F		Depth (cm)		Surface Area ft x ft ~~(m x m)~~		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP-1		86°	84°	4-7	20	33 x 15	150 x 100				✓								FS present collected >10000

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli)*.
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Fire Ops Facility [redacted] | **County:** SD | **Quad:** | Township: | Range: | Section:

SURVEYOR / Permit Number: Doug Allen

Date: 3/19/18 | **Time:** 1:45 p | **Weather Conditions:** 70°F <10%cc , 2–8 mph

Feature ID #	UTM (Northing, Easting, Datum)	Temp (~~°C~~) F		Depth (cm)		Surface Area ft (~~m x m~~)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomidae			
FOVP-4		70	82	5	7-8	30x20	see gps											Mosquito Larvae	No FS
FOVP-5		70	82	3-7	1ft	←	3x2 3x1 9x3.5			✓								Mosquito Larvae	No FS

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
(Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

This page intentionally left blank

APPENDIX E

VERNAL POOL HABITAT CONSERVATION PLAN

CONSISTENCY ANALYSIS

Vernal Pool Habitat Conservation Plan - Minor Amendment

Consistency Analysis

for

Fire-Rescue Air Operations – Phase II

Prepared for

U.S. Fish and Wildlife Service

California Department of Fish and Wildlife

City of San Diego – Planning Department MSCP

Prepared by

City of San Diego - Public Works Department

Senior Planner/Biologist: Sean Paver

December 17, 2018

Table of Contents

Tables

Figures

1. Introduction

The City of San Diego (City) in partnership with U.S. Fish and Wildlife Service (USFWS) and California Department of Wildlife (CDFW), has entered into a planning agreement to protect, enhance, and restore vernal pool resources within the City's jurisdiction, while improving and streamlining the environmental permitting process for impacts to threatened and endangered species associated with vernal pools. The Vernal Pool Habitat Conservation Plan (VPHCP) allows for limited impacts to the seven covered species, from covered projects, while mandating the conservation and management of the covered species and their habitats in perpetuity.

During development of the VPHCP, a Minor Amendment Process was developed for the two airports owned and operated by the City; Montgomery-Gibbs Executive Airport and Brown Field Airport. The Minor Amendment Process would allow for impacts to vernal pool and VPHCP covered species located within the legal boundaries of the airport properties while meeting health and safety requirement of the airports.

For the Minor Amendment, the VPHCP requires submittal of the project to USFWS and CDFW for review to determine if the project is consistent with the VPHCP. The consistency determination would be based on the VPHCP; the Vernal Pool Maintenance and Monitoring Program (VPMMP); Multiple Species Conservation Program (MSCP); and the City's ESL and Biology Guidelines. Once it is determined the project is consistent with the VPHCP, the Wildlife Agencies will provide a Letter of Concurrence and the project will proceed in accordance with the VPHCP approval of a Minor Amendment.

2. Background

The City is proceeding with a project located on Montgomery-Gibbs Executive Airport (Airport) that will impact vernal pool habitat and a VPHCP covered species. This project, Fire-Rescue Air Operations – Phase II (Project) proposes to redevelop the area around an existing building on the Airport to support the Fire Departments fleet of helicopters (Figure 1). Redevelopment would include the installation of concrete helicopter-pads, aircraft hangars, fuel tank, and maintenance room. The project location was chosen based on location of the existing Fire-Operation facility and existing heli-pad, and the need to locate additional air operation facilities adjacent to these facilities; the site was also initially identified as an area that would potentially avoid impacts to environmental resources.

a. Project Description

The Fire-Rescue Air Operations Phase II portion of this project will provide new hangar space and a concrete apron to accommodate five helicopters, parking and shelter for a single Heli-tender and two fueling tender vehicles. The total area of new hangar space will be approximately 32,000 SF, of which approx. 16,500 SF is existing disturbed and/or impervious area. The new hangar space includes a hangar support area for maintenance offices, overhaul, avionics and storage rooms. The new apron area will be approximately 65,000 SF of 5000 PSI concrete, of which approx. 9,300 SF is existing disturbed and/or impervious area. The project includes two above-ground fuel storage tanks, each with 12,000 gallon capacity (24,000 gallons total). The staging area for the project will be placed on existing paved and/or disturbed area. The designed size of the staging area is approximately 4,000 SF. In addition to the hangars and concrete apron, the project will also address any damages to the existing access road, from Ponderosa Avenue, sustained from construction activities. The rehabilitation of the existing access road will include a two-inch overlay of asphalt material in any areas deemed necessary and not impact any undisturbed areas. The primary project area is located outside of the MHPA, the access road to the project site is located partially within the MHPA.

b. Potential Impacts

The proposed project area has historically been disturbed through a number of activities including, regular mowing to comply with FAA requirements, temporary parking, access roads, and utilities. The habitat within the project area is a combination of existing development and disturbed habitat. The entire airport is located on a relatively flat mesa top with predominately clay soils. The flat terrain and clay soils provide the ideal conditions for the development of vernal pools, as such the airport has a number of existing pools and road ruts found throughout. Our project area had no previously documented vernal pools within the footprint. Biological survey and monitoring performed for this project discovered 6 vernal pools within the project footprint. These pools are heavily disturbed and meet the City's definition of a vernal pool (at least 1 indicator species) with the presence of wooly marbles (*Psilocarphus brevissmus*) in all pools and prairie plantain (*Plantago elongata*) in one pool. Wet and dry season protocol surveys were performed within the project area and a 100-foot buffer for San Diego fairy shrimp. During the 2017/2018 wet season, one pool within the project footprint held water long enough to only conduct one wet season survey. The remaining pools within the project footprint did not hold water for the required duration for any surveys to be performed during the wet season. Dry season surveys were performed within the project footprint and identified fairy shrimp cysts in 2 of the 4 pools. The cyst were not hatched, but are assumed to be San Diego fairy shrimp based on the known presence of San Diego fairy shrimp in the immediate area, and no previous observations of variable fairy shrimp (*Branchinecta lindahli*) on the airport. Additional wet season surveys were initiated for the 2018/2019 wet season. The preliminary results from these surveys have identified two additional vernal pools within the project footprint, both observed with fairy shrimp. As a result, this project proposes to impact 6 vernal pools, totaling 0.0735 acres, four of which are occupied by San Diego fairy shrimp (Figure 2). The four pools with SDFS are heavily disturbed, and are located where parking of vehicles use to occur. No other VPHCP covered species were detected within the project footprint. This project will also impact Spreading navarretia Critical Habitat; no spreading navarretia have be detected on the airport. A Biological Technical Report has been prepared for this project, and additional details beyond those discussed here can be found within the report.

c. Mitigation

To offset impacts to the vernal pools from this project, the City will restore and re-establish vernal pools located at the South Otay 1-acre parcels [(J13N)(Figure 3)]. This site was chosen for a number of reason including: existing vernal pools; topography; need for restoration; presence of VPHCP species; and location relative to airports. This site has existing, heavily degraded vernal pools, with VPHCP species such as San Diego button-celery, California Orcutt grass, and spreading navarretia. Implementation of this restoration project will result in the restoration of 0.22 acres of existing pools, re-establishment of at least 0.0735 acres of pools, and is consistent with the VPHCP Conservation Objectives. A vernal pool restoration plan, in compliance with the VPHCP, is currently being prepared and will be provided for review once completed. The restoration project will include dethatching and weed treatment, grading, seed and inoculum collection, container plant installation, hydroseed, fence installation, and maintenance and monitoring. It is expected that seed and inoculum will be collected from the existing disturbed vernal pools within the J13N complex, and collected from nearby vernal pool complexes such as Cal Terraces and Goat Mesa to help establish viable populations of target VPHCP covered species.

3. Consistency Determination

This Consistency analysis will compare the goals and objectives of the VPHCP, with the proposed project and mitigation to determine if the project is consistent with VPHCP, VPMMP, City's Biological Guidelines, and MSCP, as required through the Minor Amendment process. The VPHCP's overall conservation strategy for the covered species is to allow impacts to degraded vernal pools with low long-term conservation value in exchange for restoration, enhancement, preservation, and long-term management and monitoring of vernal pools with long-term conservation value in the MHPA. The biological goal of the VPHCP is to contribute to the recovery of the VPHCP covered species and ensure continued persistence of the covered vernal pool species population identified in the VPHCP and the City's existing NCCP.

This project will achieve those goals and meet conservation objectives of the VPHCP. This project will impact degraded vernal pools with low conservation value, outside the MHPA, and restore vernal pools with long-term conservation value in the MHPA while contributing to the recovery of multiple VPHCP covered species. In addition, all of the general avoidance and minimization measures provided in the VPHCP will be implemented throughout the project.

a. VPHCP Conservation Objectives

The following table outlines the conservation objectives of the VPHCP and describes how the project is consistent with these objectives and will meet the goals of the VPHCP.

Table 1: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
Vernal Pools Objectives (Habitat Based)	Conserve in perpetuity at least 2,409 vernal pools (totaling approximately 37.5 acres of basin surface area) at 68 vernal pool sites (within 53 vernal pool complexes) in the MHPA in a configuration that maintains long-term viability of the VPHCP covered species.	Manage in perpetuity 59 vernal pool sites within the MHPA through implementation of the VPHCP Vernal Pool Management and Monitoring Plan or Site-Specific Management Plans (that are consistent with the VPHCP goals and objectives).	Restore 19 vernal pool sites (within 12 complexes) to a “Level 1” (stewardship) management condition within the MHPA through implementation of the VPHCP Management and Monitoring Plan or Site-Specific Management Plans (that are consistent with the VPHCP goals and objectives).	This project proposes to impact four vernal pools (0.0735 acre) outside of the MHPA and proposes to re-establish and restore vernal pools inside the MHPA at a 2:1 ratio in a configuration that maintains long-term viability of VPHCP covered species. The mitigation associated with this project will increase the number of pools and basin surface area of conserved vernal pools within the MHPA. The restoration project will restore the J13N complex from a Level 3 to a Level 1 management condition. The J13N complex will be managed in perpetuity in accordance with the VPMMP.

Table 1: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
Species-Specific Objectives	Conserve occupied complexes identified in Appendix A of the VPMMP to stabilize covered species' populations.	Manage specific sites identified in Appendix A of the VPMMP to maintain the covered species populations consistent with the VPMMP (Appendix D).	Restore specific complexes identified in Appendix A of the VPMMP to enhance covered species populations to ensure long-term viability.	This project will impact pools located within Montgomery Field Complex (N 5-6) and will impact pools occupied with SDFS. The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The VPHCP Conservation Objectives for SDFS states "Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP." The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by covered species. Additionally, as more surveys are completed within the Complex under the VPMMP, additional occupied pools are expected to be identified. This project proposes to restore and re-establish vernal pools within the Otay 1-Acre Complex (J13N). This restoration work will address the Conservation/Restoration Objectives for the J13N Complex and Conservation/Restoration Objectives for spreading navarretia, San Diego button-celery, California Orcutt grass, Otay mesa mint and Riverside fairy shrimp. The restoration project will establish viable populations of these species.
Otay Mesa Mint	Conserve 369 vernal pools occupied by Otay Mesa mint within four sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of Otay Mesa mint within the J13E, J13N, J16–18, J20–21, J27, and J28 complex series.	This project will not impact any vernal pools occupied by Otay Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will incorporate Otay Mesa Mint to establish a viable population at J13N.

Table 1: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
San Diego Mesa mint	Conserve 335 vernal pools occupied by San Diego mesa mint within 19 sites.	Manage 12 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	This project will not impact any vernal pools occupied by San Diego Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP.
Spreading navarretia	Conserve 94 vernal pools occupied by spreading navarretia within seven sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of spreading navarretia within J11E, J11W, J12, J13E, J13 N, J16–18, J20–21, J27, J28, and R1.	This project will not impact any vernal pools occupied by spreading navarretia, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration plan will restore and incorporate spreading navarretia to establish a viable population at J13N.
San Diego button-celery	Conserve 722 vernal pools occupied by San Diego button-celery within 24 sites.	Manage 22 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Establish a viable population of San Diego button-celery within J13E and J13N.	This project will not impact any vernal pools occupied by San Diego button-celery, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate San Diego button-celery to establish a viable population at J13N.
California Orcutt grass	Conserve 58 vernal pools occupied by California Orcutt grass within three sites.	Manage all conserved complexes/sites consistent with the VPMMP.	Establish viable populations of California Orcutt grass within J11E, J11W, J12, J13E, J14, J16-18, J20–21, J21, J27, and J28E.	This project will not impact any vernal pools occupied by California Orcutt grass, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate California Orcutt grass to establish a viable population.

Table 1: VPHCP Conservation Objectives				
Objectives	**Conserve**	**Manage**	**Restore**	**Consistency**
Riverside fairy shrimp	Conserve 131 vernal pools occupied by Riverside fairy shrimp within 7 sites.	Manage all conserved sites consistent with the VPMMP.	Establish viable populations of Riverside fairy shrimp within J11E, J11W, J12, J13E, J13N, J14, J16-18, J20–21, J21, J27, and J28E.	This project will not impact any vernal pools occupied by Riverside fairy shrimp, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration plan will incorporate Riverside fairy shrimp to establish a viable population.
San Diego fairy shrimp	Conserve 465 vernal pools occupied by San Diego fairy shrimp within 38 sites.	Manage 33 sites as identified in Appendix A of the VPMMP and consistent with the VPMMP.	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	This project will impact pools occupied with SDFS. The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by SDFS. Additionally, as more surveys are completed within the Complex under the VPMMP, additional occupied pools are expected to be identified.

b. Multiple Species Conservation Plan (MSCP) – Land Use Adjacency Guidelines

The project lies within the City's MSCP Subarea and occurs adjacent to lands designated as MHPA under the MSCP. Projects occurring adjacent to the City's MHPA, must adhere to the City's MHPA land use adjacency guidelines as outlined in section 1.4.3 of the City's MSCP Subarea Plan. The guidelines and analyses of project conformance are as follows:

Drainage

All new and proposed development adjacent to the MHPA must not drain directly into the preserve, and must prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the MHPA.

The design of the project incorporates the use of retention basins and permanent storm water Best Management Practices (BMP) to capture and treat all storm water flows, up to a 100 year storm event, within the Project Site. These project design features will prevent toxins and other materials from entering the MHPA and will result in an improvement over current conditions. The project will also comply with the City's Landscape Regulations to prevent exotic plant materials from entering the MHPA. The project would not result in a significant impacts to drainages.

Toxins

Land uses such as recreation and agriculture that use chemicals or generate byproducts that are potentially toxic or harmful to wildlife, habitat, or water quality must incorporate measures to reduce the impact of application or drainage of such materials into the MHPA.

The proposed project would not involve recreation or agriculture, and the project would not use chemicals or generate toxic or harmful byproducts. The proposed project would incorporate permanent storm water BMP's to prevent the drainage of toxins or harmful materials into the MHPA. There would not be a change to the baseline conditions and the project would not result in a significant impact due to toxins.

Lighting

Lighting must be directed away from the MHPA and, if necessary, adequately shielded to protect the MHPA and sensitive species from night lighting.

This project involves the construction of hangars and will include some exterior lighting. All lighting will be shielded and directed away from the MHPA. In addition, this project is located on an airport adjacent to the runway, the FAA has specific requirements regarding lighting which are more stringent than the adjacency requirements of the MHPA.

Noise

Uses adjacent to the MHPA must be designed to minimize noise that might impact or interfere with wildlife utilization of the MHPA.

The proposed project is located on an airport adjacent to a runway. Ambient noise levels are much higher at the project site and within the adjacent MHPA than typically found elsewhere. The project will construct hangars and concrete pads for aircraft storage and maintenance. This land use is consistent with the existing use of the area and will not result in an increase of noise within the MHPA and will not interfere with the existing wildlife utilization of the MHPA. During construction, heavy equipment such as dozers, excavators, and loaders will be utilized. Construction noise is not expected to exceed the existing ambient noise levels on the airport, but to ensure noise impacts to sensitive/listed species is avoided, mitigation measures will be implemented during the breading season to avoid indirect impacts.

Barriers to Incursion

New development adjacent to the preserve may be required to provide barriers along MHPA boundaries to redirect public access to appropriate locations and reduce domestic animal predation in the preserve.

The project is located on an airport, which has restricted access and prevents access to the public. This project will not increase access to the MHPA, or the occurrence of domestic animals near the MHPA. To help prevent any accidental access to the MHPA during airport operation, a barrier will be installed along the project boundaries after completion of the project. This barrier would consist of 3 to 4-foot tall poles connected by rope or chain, and would be primarily designed to prevent vehicle entry into the MHPA. The barrier design will require approval by the FAA prior to installation. As a result of the restrictive access and the installation of the barrier, no impacts to the MHPA would occur as result of this project.

Invasive Species

No invasive plant species shall be introduced into areas adjacent to the MHPA.

The proposed project does not include the installation of any ornamental landscaping. Any areas where temporary impacts occur would be revegetated in accordance with the City's Landscape Standards, and would only include native species. Therefore, the project would not result in a significant impact due to invasive species.

Brush Management

New residential development located adjacent to and topographically above the MHPA must be set back from slope edges to incorporate Zone 1 brush management areas on the development pad and outside of the MHPA. Zone 2 may be located in the MHPA upon granting of an easement to the City (or other acceptable agency) except where narrow wildlife corridors require it to be located outside of the MHPA.

New residential development is not proposed with this project, and installation of the hangar and concrete pad does not require additional brush management.

Grading/Land Development

Manufactured slopes associated with project development must be included in the project footprint.

No manufactured slopes are associated with the proposed project.

c. MHPA – Compatible Land Uses

The access road leading from Pondarosa Ave to the project area crosses through the MHPA. This existing road will provide construction access to the project area. Following completion of construction, it may be necessary to repair the access road. Repair work would include filling in pot holes/cracks, grinding the damaged surface, and/or installing a 2-inch overlay. All work would be restricted to the existing road surface and the road would not be widen or expanded.

Roads are considered a compatible use of the MHPA if they comply with Section 1.4.2 of the City's MSCP Subarea Plan. The majority of the policies and guidelines described in Section 1.4.2 apply to new access roads in the MHPA. This project will use an existing road within the MHPA and only those policies and guidelines related to existing roads are discussed below.

Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitat unless determined to be unavoidable. All such activities must occur on existing agricultural lands or in other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, then restoration of, and/or mitigation for, the disturbed

area after project completion will be required.
The access road is existing and will not be widened or extended, no impacts to existing habitat will occur as a result of this project.

Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. Environmental documents and mitigation monitoring and reporting programs covering such development must clearly specify how this will be achieved, and construction plans must contain all the pertinent information and be readily available to crews in the field. Training of construction crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.
The access road is located on the airport, which is surrounded by development; the project area is not located in a wildlife corridor. A project biologist will assigned to the project and will provide training to construction crews.

For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary as identified in the Framework Management Section 1.5 (MSCP Subarea Plan).
The existing road is the only road that provides access to the Fire-Rescue Air Operations Building and FAA Control Tower; the road is not underutilized or duplicative.

d. City of San Diego Biological Guidelines

i. Overview - Development Regulations

The City of San Diego Biological Guidelines (Guidelines)have been formulated by the Development Services Department to aid in the implementation and interpretation of the Environmentally Sensitive Lands Regulations, San Diego Land Development Code, Chapter 14, Division 1, Section 143.0101 et seq, and the Open Space Residential (OR-1-2) Zone, Chapter 13, Division 2, Section 131.0201 et seq. Section III of the Guidelines (Biological Impact Analysis and Mitigation Procedures) also serve as standards for the determination of impact and mitigation under the California Environmental Quality Act (CEQA) and the Coastal Act.

These Guidelines are intended to prescribe the content of biology survey reports and will be used in the analysis and preparation of environmental documents. The Guidelines shall be used as part of the environmental review process to meet the requirements of the CEQA, the Multiple Species Conservation Program, Vernal Pool Habitat Conservation Plan and the City's Environmentally Sensitive Lands Regulations.

The intent of the biology survey is to identify biological resources on the project site, determine impacts, and recommend suitable mitigation measures. Mitigation and monitoring requirements pursuant to the Guidelines and CEQA shall ensure preservation of the native species and sensitive biological resources of San Diego.

A biological report and surveys have been prepared for this project in accordance with the Guidelines and includes identification of biological resources, impact analysis, and mitigation measures as required by the Guidelines. The mitigation measures proposed will ensure preservation of the native species and sensitive biological resources of San Diego. The surveys and biological report were conducted and prepared by qualified biologist who meet the requirements of the Guidelines.

ii. Biological Impact Analysis and Mitigation

The guidelines provide specific mitigation requirements for impacts to sensitive habitats. Impacts to vernal pools outside the MHPA are authorized provided they are fully mitigated as identified in the VPHCP. Impacts to vernal pools outside the MHPA would not require a deviation provided they are fully mitigated consistent with the VPHCP. Mitigation for vernal pools shall be 2:1 for listed fairy shrimp or when no listed plant species are present, 3:1 for San Diego button-celery, and 4:1 when listed species with very limited distributions are present. While ratio is applied to the basin area, the mitigation site must include appropriate watershed to support restored and/or enhanced basins.

The project will impact 0.0735 acre of vernal pool located outside the MHPA. Four of the pools were determined to be occupied by San Diego fairy shrimp. In accordance with the VPHCP and Guidelines, mitigation for these impact will occur at 2:1 for a total of 0.147 acre. A minimum of 0.147 acre of vernal pool basin will be restored/reestablished and an appropriate area of watershed will be restored and conserved to support the vernal pool basins. A mitigation plan is currently being prepared in accordance with the requirements of the Guidelines, VPMMP and VPHCP, and will be provided for review.

iii. Supplemental Environmental Findings

Development on a site containing sensitive biological resources requires the approval of a Neighborhood Development Permit or Site Development Permit. The Development Permit process requires findings be made to ensure the project is consistent with the City's Land Development Code and applicable land use plan's. A development on a site containing sensitive biological resources requires that a set of six supplemental findings, related to biological resources, be made. These six findings are addressed below.

1. ***The site is physically suitable for the design and siting of the proposed development and the development will result in minimum disturbance to environmentally sensitive lands.***

   The site is physically suitable for the design and siting of the proposed development: The City has determined that there is a need to increase services for fire suppression, emergency rescues from remote areas, advanced life support, and medical transport. Currently there is no available hangar space to store the emergency helicopters and crew. The Project will provide new hangar space, a concrete apron to accommodate five helicopters, parking and shelter for a single Heli-tender and two fueling tender vehicles. The project design was created in consultation with several divisions: permit planning, environmental analysis, MSCP, Department of Development Services (DSD), and the airport biologist familiar with FFA regulations. This project is considered an Essential Public Project in that it would service the community at large and not just a single development project or property.

The Project has been proposed to be constructed at Montgomery-Gibbs Executive Airport. This is the most central of the City-owned airports and is located within an area surrounded by development, mostly in the form of businesses which will reduce disturbance to residents during evening and early morning hours. This location will also ensure that air support is equidistant to all service areas. Within the airport the project is proposed to be located in the northwest corner of the airport. This area currently harbors the existing Fire Air Operations building and can be accessed from a back entrance of the airport off of Ponderosa Road. The project proximity to the existing building and road will increase operation efficiency and may reduce incidental ESL impacts during construction. To operate efficiently, the project had to be located adjacent to the existing Fire-Rescue Air Operations facilities, adjacent to the runway, ad also had to comply with FAA sight requirements. The Project is located on a flat area, directly adjacent to the existing Air Operations facilities, and adjacent to the runway. The orientation of the design ensures an appropriate view corridor from the control tower in accordance with FFA regulations.

Siting of the development will result in the minimum disturbance to the environmentally sensitive lands: The total project footprint is approximately 3.476 acres, this includes the existing access road (0.546 acre). The project was designed to only impact Tier IV lands and avoid ESL to the maximum extent practicable. Out of the 3.476 total impact acres approximately 3.403 acres are within developed land and disturbed habitat. The disturbed habitat portion of the Project is located in the runway safety zone, this area is required by the FFA to be free of vegetation. The project site was chosen to avoid vernal pools identified in the baseline existing conditions analysis for the City's Vernal Pool Habitat Conservation Plan (VPHCP) and Vernal Pool Management and Monitoring Plan (VPMMP). However, six degraded vernal pools were newly identified within the project footprint during the biological reconnaissance survey. Approximately 0.0735 acres of the site are San Diego mesa hardpan vernal pools. Four of the vernal pools contain San Diego fairy shrimp (Branchinecta sandiegonensis – Federally Endangered, VPHCP-covered). One sensitive plant species was observed onsite, Orcutt's brodiaea (*Brodiaea orcuttii*). The project was designed to avoid impacts to the Multi-Habitat Planning Area (MHPA).

Direct impacts to vernal pools and San Diego fairy shrimp will be mitigated through offsite restoration of high quality habitat in compliance with the VPHCP. Orcutt's brodiaea is fairly common within the airport grounds and will be adequately conserved through the MSCP. Therefore, the design and siting of the Fire Operations Facility will result in minimum disturbance to environmentally sensitive lands.

2. ***The proposed development will minimize the alteration of natural landforms and will not result in undue risk from geologic and erosional forces, flood hazards, and fire hazards.***

The project is located on flat terrain within a previously developed/disturbed area and will not affect natural landforms. Ninyo & Moore Geotechnical and Environmental Sciences Consultants has prepared a geotechnical evaluation of the project, and two addenda thereof, to analyze the geotechnical conditions at the subject site. The study was informed by review of background data, subsurface evaluation, and laboratory testing, and its objective was to offer recommendations for the design and earthwork construction of the project. The report concluded that the potential for liquefaction, seismically induced settlement, tsunami, landsides, and flooding were not design considerations. The project is required to meet the 2013 California Building code and all applicable County of San Diego codes and ordinances, so it will not result in undue risk of fire hazards.

Therefore, the project as proposed will not alter natural land forms and will not result in undue risk from geologic and erosional forces, flood hazards, or fire hazards.

3. ***The proposed development will be sited and designed to prevent adverse impacts on any adjacent environmentally sensitive lands.***
   The City has determined that there is a need to increase services for fire suppression, emergency rescues from remote areas, advanced life support, and medical transport. Currently there is no available hangar space to store the emergency helicopters and crew. The Project will provide new hangar space, a concrete apron to accommodate five helicopters, parking and shelter for a single Heli-tender and two fueling tender vehicles. The project design was created in consultation with several divisions: permit planning, environmental analysis, MSCP, Department of Development Services (DSD), and the airport biologist familiar with FFA regulations. This project is considered an Essential Public Project in that it would service the community at large and not just a single development project or property.

   Environmentally sensitive lands (ESL) within the MHPA are located adjacent to the project to the northeast and east and will be avoided. The adjacent ESL is composed of Diegan coastal sage scrub with interspersed San Diego Mesa Hardpan Vernal Pools. Several of the vernal pool were identified in the baseline existing conditions analysis for the City's VPHCP and VPMMP and have been documented to be habitat for San Diego mesa mint (Pogogyne abramsii – Federal and State Endangered, CRPR 1B.1, VPHCP-covered and City Narrow Endemic), and/or San Diego fairy shrimp. California gnatcatcher (Polioptila californica – Federally threatened, State Species of Special Concern and MSCP-covered) was observed within the Diegan coastal sage scrub which may serve as foraging and/or nesting habitat for the species.

   The Project was sited to avoid impacting the adjacent ESL and MHPA. Indirect impacts to the adjacent ESL will be minimized to less than significant by installing fencing along the limits of disturbance adjacent to sensitive habitat during construction, monitoring bird activity, and permanently installing a barrier with signage to prevent unauthorized access into the MHPA and adjacent sensitive habitat.
4. ***The proposed development will be consistent with the City of San Diego MSCP Subarea Plan and Vernal Pool Habitat Conservation Plan (VPHCP).***

   The project site is within the existing boundaries of both the City of San Diego's MSCP Subarea, and the VPHCP, but will not impact the Multi-Habitat Planning Area. As described in Sections 3.a and 3.b of this document, the project is consistent with the City of San Diego MSCP Subarea Plan and VPHCP.

5. ***The proposed development will not contribute to the erosion of public beaches or adversely impact local shoreline sand supply.***

   This finding is not applicable to this project. The project is more than seven miles from the nearest beach or local shoreline. The project will not result in increased amounts of pollutants draining into the ocean because construction and permanent storm water best management practices will be implemented to collect and treat runoff from the project for pollutants as required by the current City of San Diego Storm Water Standards. The project is compliant with the regulations within the City's Storm Water Standards and consistent with the City's Storm Water Design Manual. Therefore the proposed improvements will not contribute to the erosion of public beaches or adversely impact local shoreline sand supply.

6. ***The nature and extent of mitigation required as a condition of the permit is reasonably related to and calculated to alleviate negative impacts created by the proposed development.***

   Approximately 0.0735 acres of sensitive wetlands, outside of the MHPA, in the form of vernal pools will be significantly impacted by the Project and will require mitigation. San Diego fairy shrimp and Orcutt's brodiaea, VCHCP- and MSCP-covered species respectively, will also be significantly impacted.

   Orcutt's brodiaea is a California Rare Plant Rank 1B.1 plant, meaning that it is defined as 'rare or endangered in California and elsewhere' and 'seriously endangered in California' (California Native Plant Society, 2001) and is also a MSCP-covered species. This species is only known to occur in limited distribution within San Diego County but is fairly prevalent within the airport. This species is an MSCP covered species and will be adequately conserved through implementation of the MSCP program. Therefore impacts to this species are less than significant.

   The VPHCP Conservation Objectives for San Diego fairy shrimp states "Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP." The population of SDFS within the Montgomery Field Complex is currently stable and this project will not impact any of the conserved vernal pools occupied by this covered species.

   Impacts to San Diego Mesa Hardpan vernal pool will be mitigated in accordance with the City's VPHCP and Biology Guidelines at a ratio of 2:1(see table below). A detailed mitigation plan will be prepared in accordance with requirements of the VPHCP and Biology Guidelines and will be submitted to the wildlife agencies for their approval.
   The Project will comply with the mitigation requirements and biological resource protection measures as described in the Biological Technical Report and is reasonably related to, and calculated to alleviate, negative impacts created by the proposed development

4. Conclusion

While this project will result in impacts to vernal pools and San Diego fairy shrimp, these impacts are consistent with the objectives of the VPHCP and will result in the restoration and conservation of vernal pools and habitat with higher biological value. This project is consistent with the overall goals and objectives of the VPHCP, MSCP, VPMMP, and City's Biological Guidelines and will result in the overall increase of vernal pool basin area and the establishment of VPHCP species as required by these documents.

Figure 1: Project Location
Fire-Rescue Air Operations - Phase II

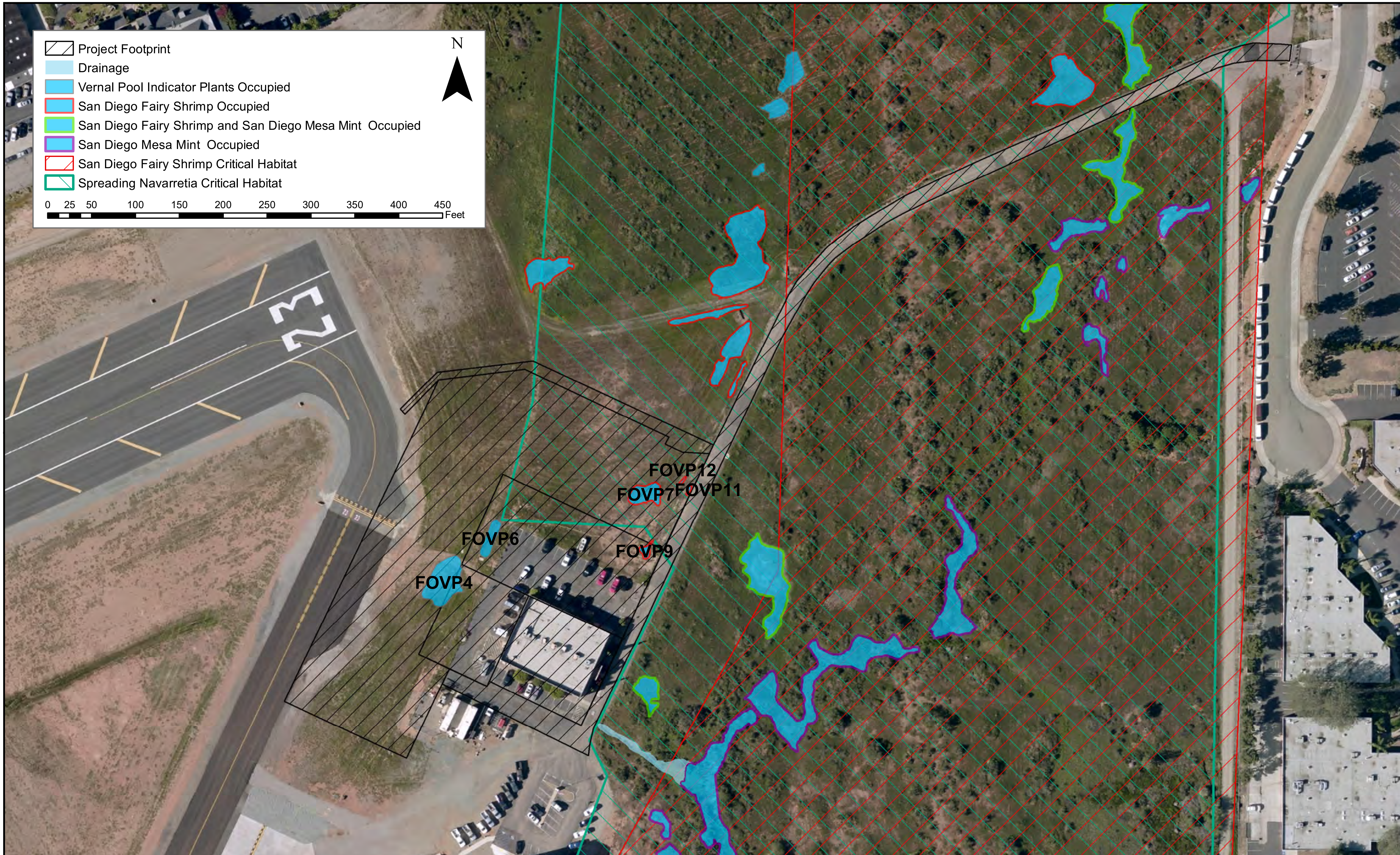


Figure 2: Vernal Pool Impacts
Fire-Rescue Air Operations - Phase II

Figure 3: South Otay 1-Acre Parcels Location
Fire-Rescue Air Operations - Phase II

APPENDIX F

CALIFORNIA RAPID ASSESSMENT METHOD REPORT

Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II, San Diego, California

California Rapid Assessment (CRAM) Report

December 17, 2018

Prepared for:

City of San Diego

Planning Department - MSCP

Development Services Department

Prepared by:

Public Works Department

Environmental and Permitting Support

525 B Street

San Diego, Ca 92101

619.533.3629

Prepared By: ___________________________________

Sean Paver, Senior Planner - Biologist

1 TABLE OF CONTENTS

FIGURES

APPENDICES

2 INTRODUCTION

The City of San Diego Public Works Department proposes to construct a new, permanent Fire Rescue Air Operations Facility (Project) at Montgomery-Gibbs Executive Airport. The facility will accommodate the emergency helicopters for the crews that will provide 24 hour on-call services during 365 days per year. The crews would provide fire suppression, emergency rescues from remote areas, advanced life support, and medical transport. Currently there is no available hangar space to store the Bell 212HP and 412EP helicopters.

2.1 LOCATION

The project site is located at Montgomery-Gibbs Executive Airport, east of Taxiway C, and north of the air traffic control tower (Figure 1). The project is located adjacent to the MHPA, in the Kearny Mesa Community Planning Area (Council District 6).

2.2 PROJECT DESCRIPTION

This project is the second phase of a two phase project on the Fire Rescue Air Operations Facility at Montgomery-Gibbs Executive Airport. Phase I is remodeling the existing 31 year-old building (formerly Federal Aviation Administration [FAA]) located adjacent to air traffic control tower. The Fire-Rescue Air Operations Phase II portion of this project will provide new hangar space and a concrete apron to accommodate five helicopters, parking and shelter for a single Heli-tender and two fueling tender vehicles. The total area of new hangar space will be approximately 32,000 square feet (SF), of which approx. 16,500 SF is existing disturbed and/or impervious area. The new hangar space includes a hangar support area for maintenance offices, overhaul, avionics and storage rooms. The new apron area will be approximately 65,000 SF of 5000 pounds-per-square-inch (PSI) concrete, of which approx. 9,300 SF is existing disturbed and/or impervious area. The project includes two above-ground fuel storage tanks, each with 12,000 gallon capacity (24,000 gallons total). The staging area for the project will be placed on existing paved and/or disturbed area. The designed size of the staging area is approximately 4,000 SF. In addition to the hangars and concrete apron, the project will also address any damages to the existing access road, from Ponderosa Avenue, sustained from construction activities. The rehabilitation of the existing access road will include a two-inch overlay of asphalt material in any areas deemed necessary and will not impact any undisturbed areas.

Hangar foundations would require excavation up to four feet in depth. This would disturb previously undisturbed soils. The total area of ground disturbance would be approximately 2.929 acres, and the project would result in 1.957 acres of new impervious surfaces, including the hangars, fueling stations, heli-tender storage buildings, concrete aprons, ramps, and vehicle parking. Portions of the 0.546 acre access road would be repaired after construction, as necessary. The maximum height of the building would be 31 feet.

3 CALIFORNIA RAPID ASSESSMENT METHOD (CRAM) OVERVIEW

The overall goal of CRAM is to "provide rapid, scientifically defensible, standardized, cost-effective assessments of the status and trends in the condition of wetlands and related policies, programs, and projects throughout California" (CWMW 2013a). CRAM is a rapid assessment method that requires collecting Level 2 data (coarse data) for monitoring wetland conditions.

One of the benefits of CRAM is that it does not require an intensive watershed-level assessment to calibrate variable scores. Instead, CRAM has been calibrated throughout California and in various wetland types. CRAM is an ambient monitoring and assessment tool that can be performed on different scales, ranging from an individual wetland to across a watershed or larger region. CRAM is designed to collect a coarse assessment of a site's ambient conditions, but it can also be used to measure progress toward meeting success criteria established for wetland function/condition, and can be repeated over the long term if necessary or desired. Level 3 (fine scale) data are not necessary to complete a CRAM assessment but are useful when determining many of the CRAM attribute scores and interpreting the final CRAM scores.

4 EXISTING CONDITIONS

Montgomery-Gibbs Executive Airport is located in Kearny Mesa. The land is flat characteristic of mesa environments and is developed with an airfield, associated buildings, and parking areas. Areas of undeveloped land occur between runways, in clearance zones and on the periphery of the airfield. The areas adjacent to the runways are routinely mowed and the undeveloped land located northeast and northwest of the existing facilities building are occasionally used for overflow parking. This area is well known to support vernal pools, and pools have been well-documented on the Montgomery-Gibbs Executive Airport (VCHCP, 2017).

The northeastern portion of the site where Hangar A and Concrete Apron are proposed to be located overlaps with critical habitat for spreading navarretia as designated by the United States Fish and Wildlife Services. The 100-foot survey buffer overlaps with critical habitat for San Diego fairy shrimp but does not overlap with the project footprint. The project footprint is adjacent to the MHPA, the access road is within the MHPA.

The vegetation within the Project Footprint is primarily disturbed and developed but supports some areas of San Diego mesa claypan vernal pools. The vernal pools onsite are located within the Project footprint in the areas proposed for the concrete apron and hangar A and B. These vernal pools are located in a disturbed area and contained the following vernal pool indicator species: wooly marble (*Psilocarphus brevissimus*) and/or prairie plantain (*Plantago elongata*) and San Diego fairy shrimp.

5 METHODS

On May 25, 2018, City staff CRAM practitioners (Sean Paver and Maya Mazon) conducted a CRAM evaluation of four vernal pools or assessment areas (AA) within the project impact area (FOVP-4, FOVP-6, FOVP-7, and FOVP-9). The CRAM practitioners walked the AAs and documented information used to score each metric. In addition, photographs were collected for each AA (Attachment B). After recording observations within the AA, the CRAM practitioners scored each CRAM metric/submetric and calculated the attribute scores and a final overall CRAM score (see Results section below) (CWMW 2013b)

The final CRAM score for each AA is composed of four main attribute scores (buffer and landscape context, hydrology, physical structure, and biotic structure), which are based on the metric and submetric scores (a measurable component of an attribute). CRAM practitioners assign a letter rating (A–D) for each metric/submetric based on a defined set of condition brackets ranging from an "A" as the theoretical best case achievable for the wetland class across California, to a "D," the worst case achievable. Each metric condition level (A–D) has a fixed numerical value (A=12, B=9, C=6, D=3), which, when combined with the other metrics, results in a score for each attribute. Each metric/submetric condition level (letter rating) has a fixed numerical value, which, when combined with the other metrics, results in a raw score for each attribute. That number is then converted to a percentage of the maximum score achievable for each attribute and represents the final attribute score, ranging from 25% to 100%. The final overall CRAM score is the sum of the four final attribute scores, ranging from 25% to 100%.

6 RESULTS

The results below represent the assessment of CRAM metrics and sub-metrics based on ambient conditions observed during the field visits in May (Table 1). Maps showing the locations of all four CRAM AA's are included as Attachment A and data sheets are included as Attachment C. The average CRAM score from the four AA's is 53 with individual scores varying from the lowest score of 45 to the highest score of 55.

Table 1 CRAM DATA SUMMARY

CRAM ATTRIBUTES	METRICS	SCORES			
		AA-1 [FOVP-4]	**AA-2 [FOVP-6]**	**AA-3 [FOVP-7]**	**AA-4 [FOVP-9]**
Buffer and Landscape Context	Aquatic Area Abundance	B (9)	B (19)	A (12)	A (12)
	Buffer Submetrics				
	- Percent of AA with Buffer	C (6)	B (9)	A (12)	C (6)
	- Average Buffer Width	B (9)	B (9)	B (9)	A (12)
	- Buffer Condition	C (6)	C (6)	C (6)	C (6)
	Attribute Score (Raw/Final)	**16/65%**	**16/68%**	**20/83%**	**19/79%**
Hydrology	Water Source	C (6)	C (6)	B (9)	B (9)
	Hydroperiod	B (9)	B (9)	B (9)	B (9)
	Hydrologic Connectivity	C (6)	C (6)	B (9)	C (6)
	Attribute Score (Raw/Final)	**21/58%**	**21/58%**	**27/75%**	**24/67%**
Physical Structure	Structural Patch Richness	D (3)	D (3)	D (3)	D (3)
	Topographic Complexity	D (3)	D (3)	D (3)	D (3)
	Attribute Score (Raw/Final)	**6/25%**	**6/25%**	**6/25%**	**6/25%**
Biotic Structure	Horizontal Interspersion and Zonation	D (3)	D (3)	D (3)	D (3)
	Plant Community Composition Submetrics				
	- Number of Co-dominant Species	B (9)	C (6)	C (6)	B (9)
	- Percent Non-native	D (3)	D (3)	B (9)	D (3)
	- Endemic Species Richness	D (3)	D (3)	D (3)	D (3)
	Plant Community Composition Metric Average	5	4	6	15
	Attribute Score (Raw/Final)	**8/33%**	**7/29%**	**9/38%**	**8/33%**
Overall AA Score		**45**	**45**	**55**	**51**

7 DISCUSSION

7.1 ATTRIBUTE 1: BUFFER AND LANDSCAPE CONTEXT

7.1.1 Metric 1: Aquatic Area Abundance

The Aquatic Area Abundance of an AA is assessed in terms of its spatial association with other areas of aquatic habitat, such as other wetlands, lakes, streams, etc. It is assumed that wetlands close to each other have a greater potential to interact ecologically and hydrologically, and that such interactions are generally beneficial. The aquatic area of abundance metric score is influenced by other wetlands within 500 meters to the north, south, east, and west of the AA. Four lines are extended in the cardinal direction from the center of the AA, and the percentage of each line that intersection another aquatic resource is recorded (Attachment XX, Figures 1, 3, 5, & 7). The four AA's metric scores varied between A and B. Two of the AA's (FOVP-7, FOVP-9) shared same score, A, of which 31% (FOVP-7) and 30% (FOVP-9) of transects intersect other aquatic areas. Both of these vernal pools are located on the northern portion of the site. To the east of the project site are undisturbed areas of DCSS and large vernal pool complexes, separated by an access road from the project site (Attachment A, Figures 5, 7). AAs FOVP-4 and FOVP-6 have a metric score of B of which 15% (FOVP-4) and 20% (FOVP-6) of transects intersect other aquatic areas. Both of these AAs are located on the western portion of the site and are separated from the larger vernal pool complexes to the east by developed areas such as parking lots and buildings (Attachment A, Figures 1, 3).

7.1.2 Metric 2: Buffer Submetrics

7.1.2.1 Percent of AA with Buffer

This submetric is based on the relationship between the extent of buffer and the functions provided by aquatic areas. Areas with more buffer typically provide more habitat values, better water quality and other valuable functions. This submetric is scored by visually estimating from aerial imagery (with field verification) the percent of the AA that is surrounded by at least 5 meters of buffer land. One AA, FOVP-7, had the highest metric score of A. FOVP-7 is the only vernal pool that is surrounded on all sides by eligible buffer land (Attachment A, Figure 6). The other three AAs have developed lands to some degree within proximity that eliminate the amount of eligible buffer land calculated in the metric score.

7.1.2.2 Average Buffer Width

The average width of the buffer adjoining the AA is estimated by average the lengths of eight straight lines drawn at regular intervals around the AA from its perimeter outward to the nearest non-buffer land cover or 250 meters, whichever is first encountered. It is assumed that the functions of the buffer do not increase significantly beyond an average width of about 250 meters. The maximum buffer width is therefore 250 meters. The minimum buffer width is 5 meters, and the minimum length of buffer along the perimeter of the AA is also 5 meters. Any area that is less than 5 meters wide and 5 meters long is too small to be a buffer. Three AAs, FOVP-4, FOVP-6, and FOVP-7, scored B with an average buffer width between 130 and 189 meters.

7.1.2.3 Buffer Condition

The condition of a buffer is assessed according to the extent and quality of its vegetation cover, the overall condition of its substrate, and the amount of human visitation. Evidence of direct impacts (parking lots, buildings, etc.) by people are excluded from this metric. All four AAs (FOVP-4, FOVP-6, FOVP-7, and FOVP-9) have a metric score of C due to the high amount of non-native vegetation on site compared to native vegetation. These vernal pools are impacted by activities of the current airport and SDFD operations. These pools are subject to routine mowing activities and are often subject to vehicular traffic. As a result, soils within the vernal pools are compacted.

7.2 ATTRIBUTE 2: HYDROLOGY

7.2.1 Metric 1: Water Source

Water sourced directly affect the extent, duration, and frequency of saturated or ponded conditions within an AA. Water sources include the kinds of direct inputs of water into the AA as well as any diversions of water from the AA. Diversions area considered a water source because they affect the ability of the AA to function as a source of water for other habitats while also directly affecting the hydrology of the AA. Natural, direct sources include rainfall, and ground water discharge. The AAs located on the northern portion of the project site, (FOVP-7, FOVP-9) scored B. These pools are located closer to the undisturbed natural areas with larger vernal pool complexes; however, these pools are located close to developed areas that indirectly affect the hydrology. The AA's located on the western portion of the project site (FOVP-4, FOVP-6) are more directly influenced by the SDFD and airport operations. There is a hydrant system used by the SDFD operations that contribute unnatural water sources to these pools, and as a result, the metric score for FOV-P4 and FOVP-6 is C.

7.2.2 Metric 2: Hydroperiod

Hydroperiod is the characteristic frequency and duration of inundation or saturation of a wetland during a typical year. Vernal pools are ephemeral wetlands that form in shallow depressions underlain by bedrock or by an impervious, near-surface soil horizon. These depressions fill with rainwater and runoff during the winter and may remain inundated until spring or early summer, sometimes filling and emptying repeatedly during the wet season. All four AAs, FOVP-4, FOVP-6, FOVP-7, and FOVP-9, had a metric score of B. All four pools are within proximity of airport and SDFD facilities of which during wet seasons have greater inundation due to impervious surfaces compared to what would be expected in a more natural environment.

7.2.3 Metric 3: Hydrologic Connectivity

Hydrologic connectivity describes the ability of water to flow into or out of the wetland, or to inundate their adjacent uplands. It provides for the ecotone caused by the moisture gradient between the vernal pool and its surrounding upland. For an individual vernal pool, hydrological connectivity is scored by assessing the degree to which the rise and fall of surface water along the margin of the AA is restricted by unnatural features, such as levees and excessively high or steep banks, that truncate, foreshorten, or compress the ecotone relative to what is expected for the site given its natural topography. Three of the AAs, FOVP-4, FOVP-6, and FOVP-9, had a metric score of C of which at least 50 percent of the adjacent zones are limiting flood flows. The three AAs are located adjacent to developed areas associated with airport operations and SDFD facilities (i.e. runways, parking lots, helipads, etc.). FOVP-7 had a metric score of B. This AA is the northern most vernal pool of which is only limited by an access road to the east that is associated with general airport operations.

7.3 ATTRIBUTE 3: PHYSICAL STRUCTURE

7.3.1 Metric 1: Structural Patch Richness

Patch richness is the number of different obvious types of physical surfaces or features that may provide habitat for aquatic (including wetland) or riparian species. This metric is different from topographic complexity in that it addresses the number of different patch types, whereas topographic complexity helps evaluate the spatial arrangement and interspersion of the types. Physical patches can be natural or unnatural. All four AAs, FOVP-4, FOVP-6, FOVP-7, and FOVP-9, have a metric score of D. All four AAs had only one structural patch type, cobbles and boulders. All four AAs are heavily influenced by the SDFD and airport operations such as regular mowing, vehicular traffic, urban runoff, etc.; and as a result, lack diverse physical structures or features that provide aquatic habitat as compared to adjacent undisturbed vernal pools.

7.3.2 Metric 2: Topographic Complexity

Topographic complexity refers to the variety of elevation within a wetland due to micro-topographic features and elevation gradients. All four AAs, FOVP-4, FOVP-6, FOVP-7, and FOVP-9, have a metric score of D. All four AAs are located in areas impacted by regular airport and SDFD operations. Soils are compacted and as a result lack slopes.

7.4 ATTRIBUTE 4: BIOTIC STRUCTURE

7.4.1 Metric 1: Horizontal Interspersion and Zonation

Horizontal biotic structure refers to the variety and interspersion of plant "zones", plant monocultures or obvious multi-species association or assemblages that are arrayed along gradients of elevation, moisture, or other environmental factors. Interspersion is essentially a measure of the number of distinct plant zones and the amount of shared edge between them. All four AAs, FOVP-4, FOVP-6, FOVP-7, and FOVP-9, have a metric score of D. All four AAs are heavily influence by regular SDFD and airport operations. The pools are mowed regularly and are impacted by vehicular traffic. As a result, all four AAs have only one plant zone. These pools are similar in species makeup and lack variation.

7.4.2 Metric 2: Plant Community Composition Submetrics

7.4.2.1 Submetric A: Number of Co-dominant Species

This submetric considers all the plant species that comprise at least 10% relative cover within the pool as a whole. Only living vegetation in growth position is considered in this metric. Two AAs, FOVP-4 and FOVP-9, had a metric score of B, of which FOVP-4 had four co-dominant species and FOVP-9 had five co-dominant species. FOVP-6 and FOVP-7 had a metric score of C of which both AAs had three co-dominant species.

7.4.2.2 Submetric B: Percent Nonnative

This submetric considers all plant species that are considered co-dominant per Submetric A that are nonnative. Three AAs, FOVP-4, FOVP-6, and FOVP-9, had a metric score of D, of which roughly half of the co-dominant species were nonnative species. FOVP-7 scored a B of which only one out of the three co dominant species is considered nonnative. All four AAs have been impacted overtime by the daily operations and development of the airport and the regular SDFD operations have degraded these pools overtime through introduction of nonnative species that have encroached from ornamental landscaping and weedy nonnative species that proliferate from regular disturbances.

7.4.2.3 Submetric C: Endemic Species Richness

This submetric is based on the total number of co-dominant native plant species endemic to vernal pools that occur within the AA. All four AAs, FOVP-4, FOVP-6, FOVP-7, and FOVP-9 have metric scores of D, of which two of the AAs, FOVP-7 and FOVP-9 had only one co-dominant vernal pool endemic species observed within the AA. FOVP-4 and FOVP-6 had no co-dominant vernal pool endemic species observed within the AAs.

8 CONCLUSION

The project will directly impact all four vernal pools. These CRAM evaluations serve to provide baseline conditions of the existing vernal pools onsite that will be impacted by project activities and to inform mitigation strategies with the intent to mitigate for these pools offsite with vernal pools of similar or higher quality.

9 REFERENCES

California Wetlands Monitoring Workgroup (CWMW)
2013 California Rapid Assessment Method (CRAM) for Vernal Pools, User's Manual Version 6.1

Figure 1: Vernal Pool 4 Aquatic Area Abundance
Fire Rescue Air Operations Phase II

Figure 2: Vernal Pool 4 Buffer Width Estimate

Fire Rescue Air Operations Phase II

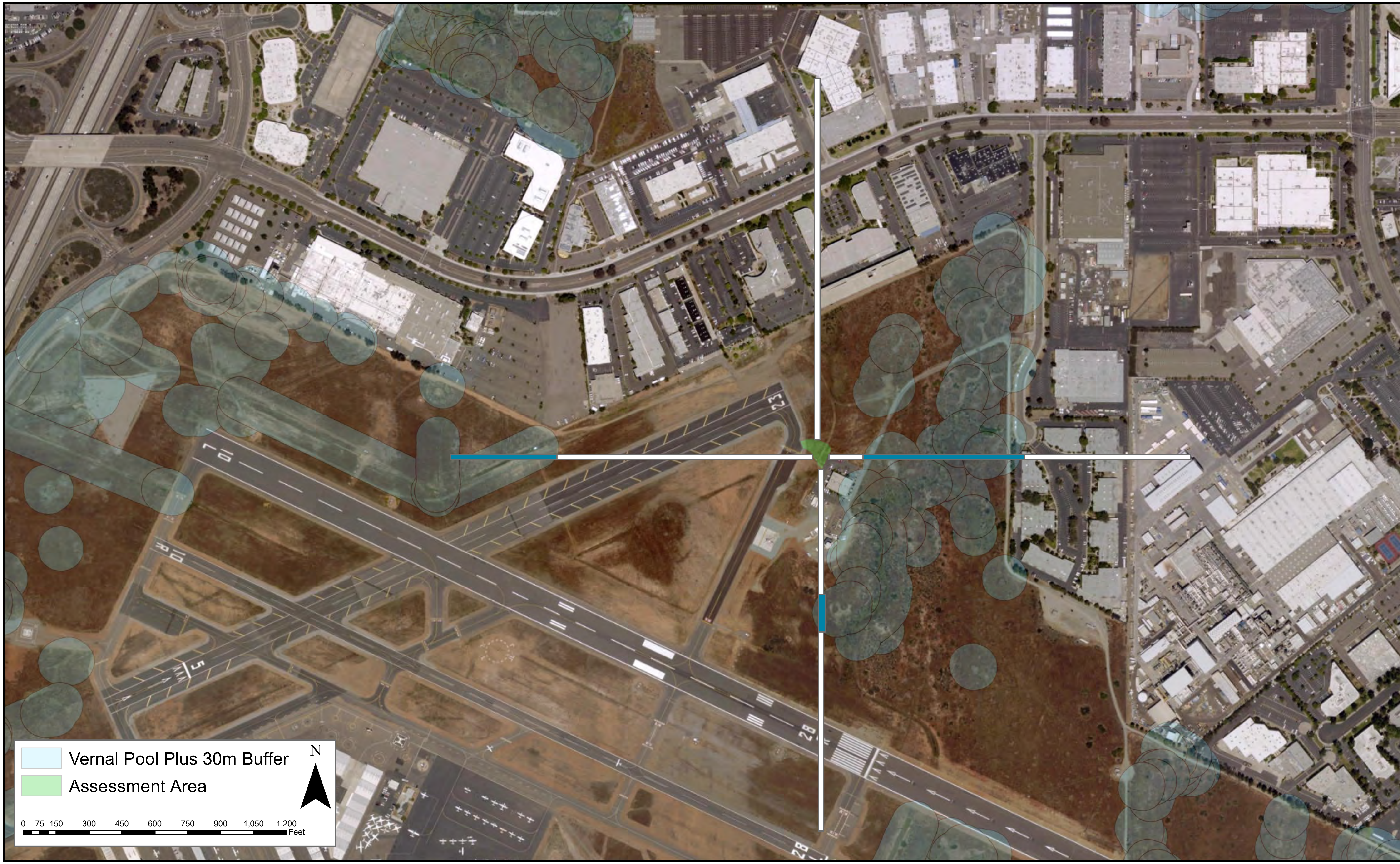


Figure 3: Vernal Pool 6 Aquatic Area Abundance

Fire Rescue Air Operations Phase II

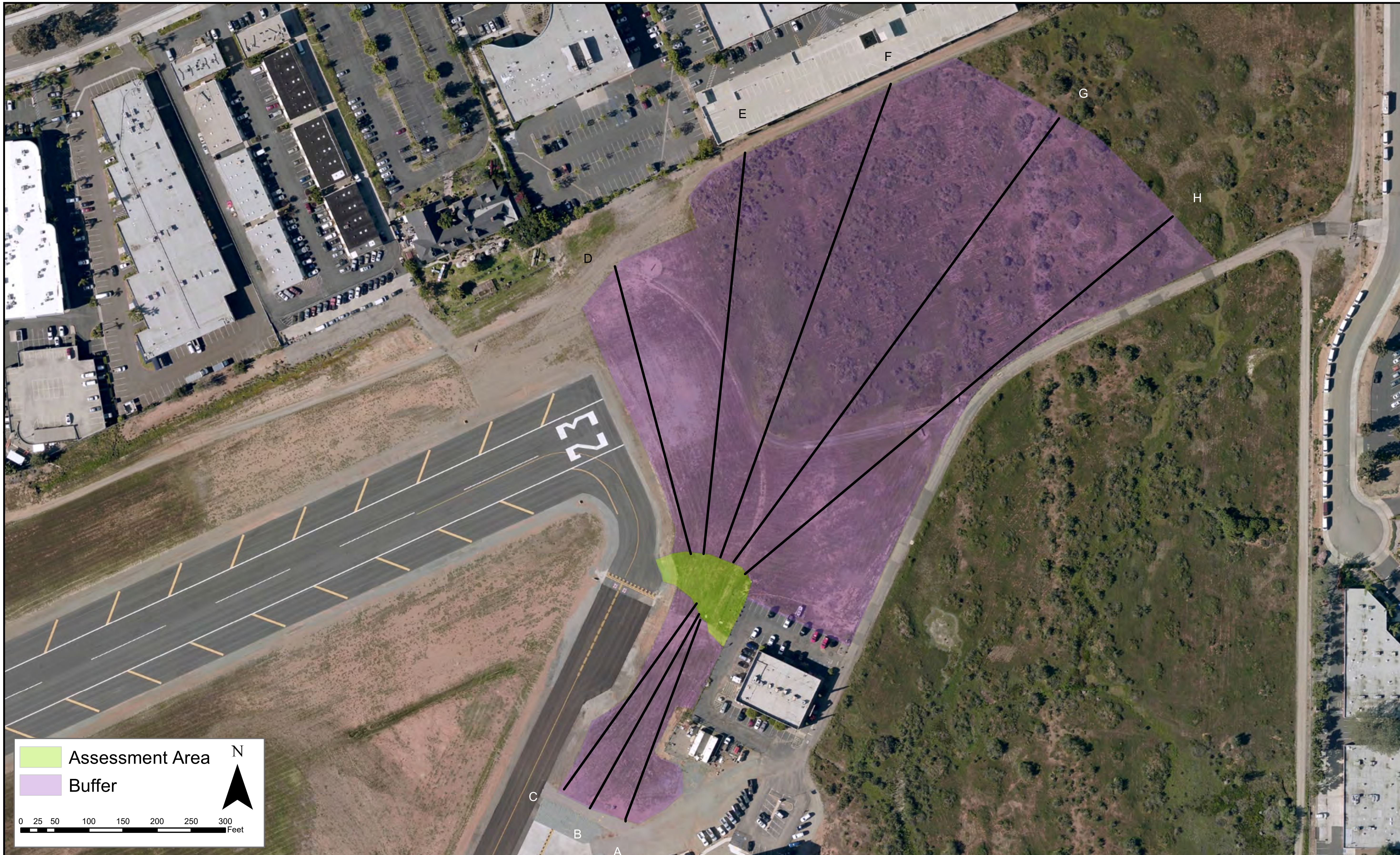


Figure 4: Vernal Pool 6 Buffer Width Estimate
Fire Rescue Air Operations Phase II

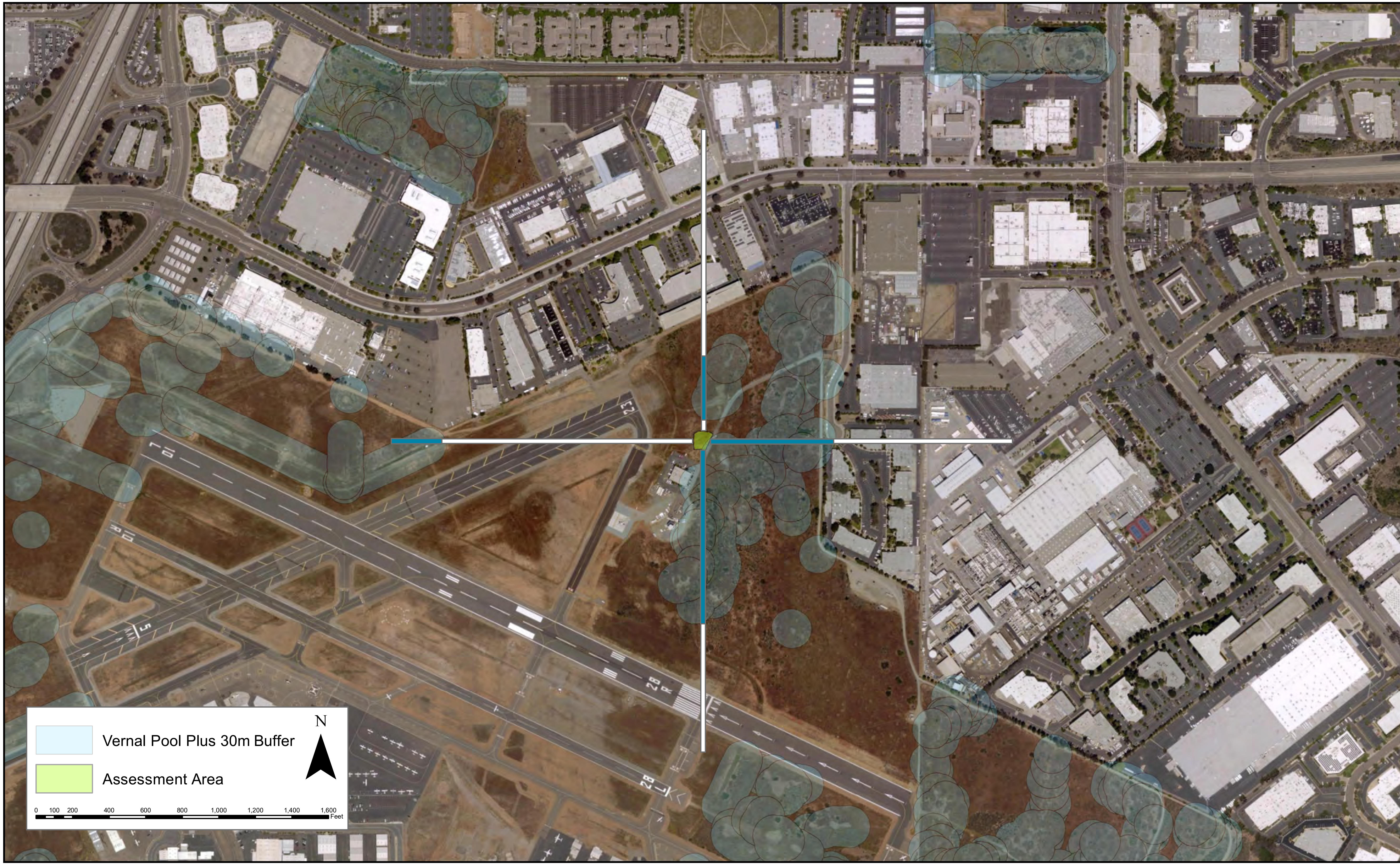


Figure 5: Vernal Pool 7 Aquatic Area Abundance
Fire Rescue Air Operations Phase II

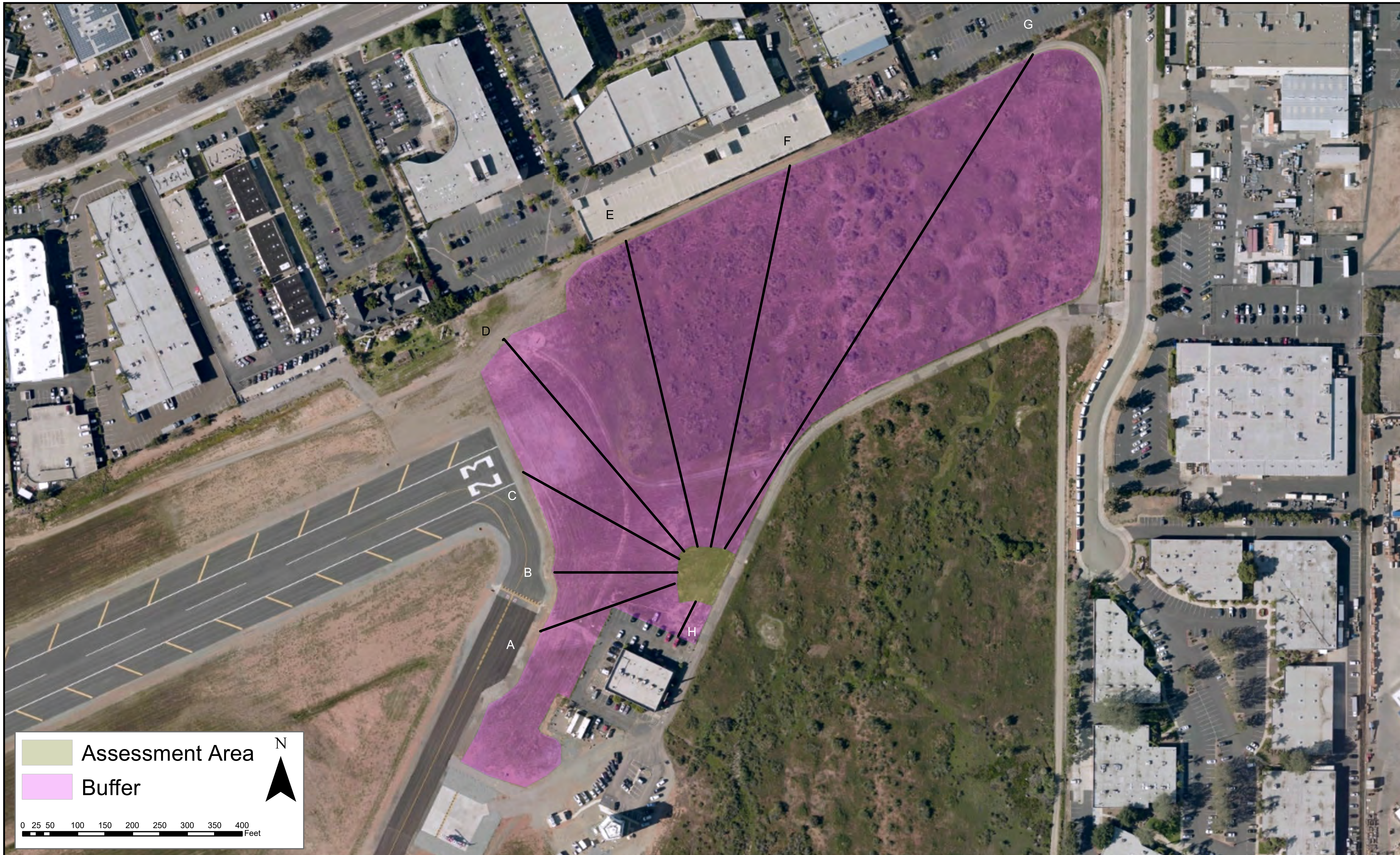


Figure 6: Vernal Pool 7 Buffer Width Estimate
Fire Rescue Air Operations Phase II

Figure 7: Vernal Pool 9 Aquatic Area Abundance
Fire Rescue Air Operations Phase II

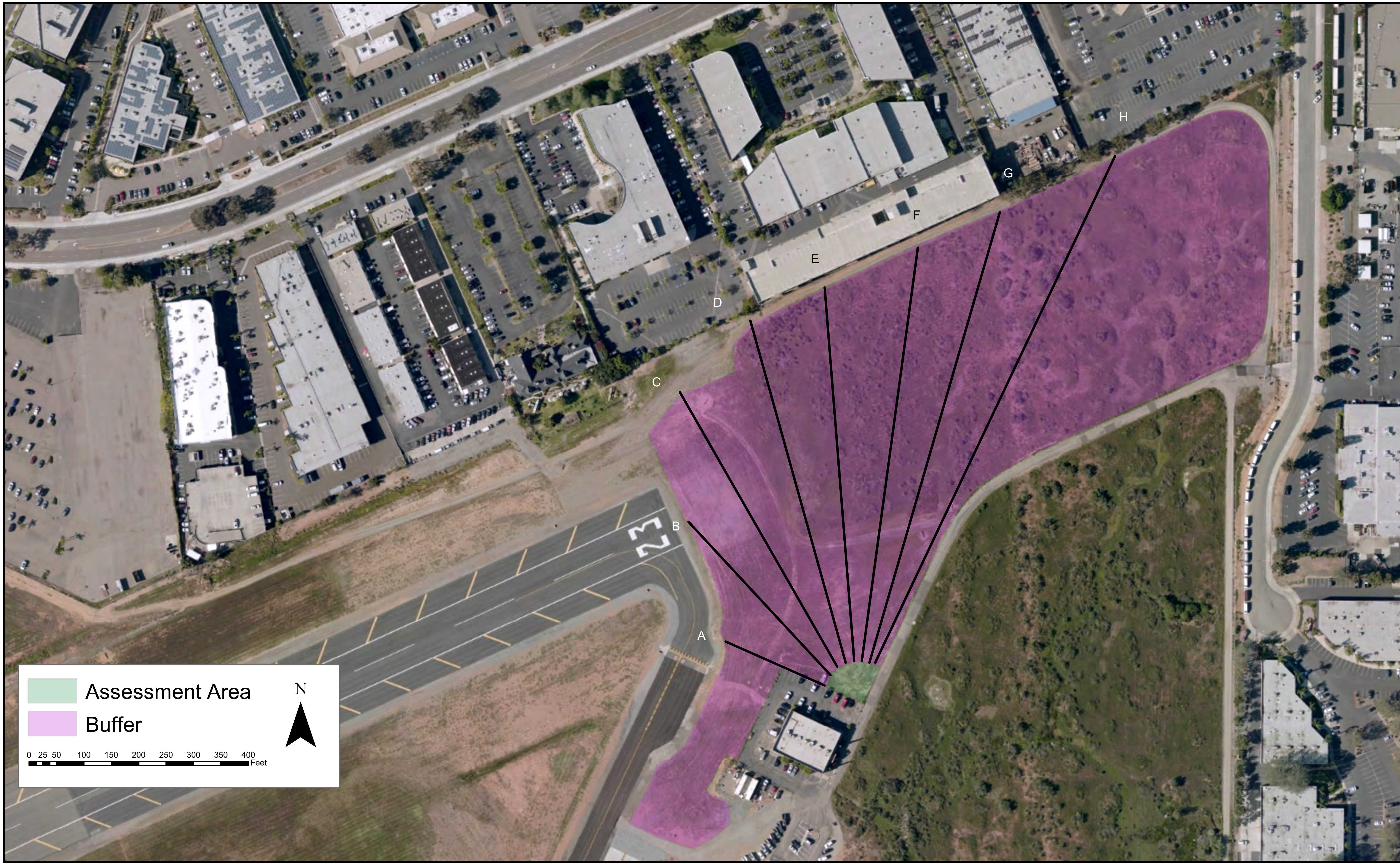


Figure 8: Vernal Pool 9 Buffer Width Estimate
Fire Rescue Air Operations Phase II

APPENDIX A

CRAM DATA SHEETS

Basic Information: Individual Vernal Pool

Assessment Area Name: VERNAL POOL 4	
Project Name: FIRE-RESCUE AIR OPERATIONS FACILITY HANGARS PROJECT	
Assessment Area ID #: FOVP 4	
Project ID #: S-15012	**Date:** 5/25/18
Assessment Team Members for This AA	
SEAN PAVER, CINDY DUNN, MAYA MAZON, DOUGLAS ALLEN	

AA Location:
Latitude: 32° 49' 04.46" N **Longitude:** 117° 08' 08.19" W **Datum:** WGS 1984

Wetland Category:
☒ Natural ☐ Constructed ☐ Restoration (Rehabilitation OR Enhancement)

If Created or Restored, does the action encompass:
☐ entire wetland ☐ portion of the wetland

What best describes the hydrologic state of the wetland at the time of assessment?
☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?
☐ long-duration ☐ medium-duration ☒ short-duration

Does the vernal pool system connect with the floodplain of a nearby stream?
☐ yes ☒ no

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North	32° 49' 04.21" N	117° 08' 08.15" W	WGS 1984
2		South	32° 49' 04.83" N	117° 08' 08.19" W	WGS 1984
3		East	32° 49' 04.44" N	117° 08' 08.77" W	WGS 1984
4		West	32° 49' 04.39" N	117° 08' 07.53" W	WGS 1984
5					
6					

Comments:

Scoring Sheet: Individual Vernal Pools

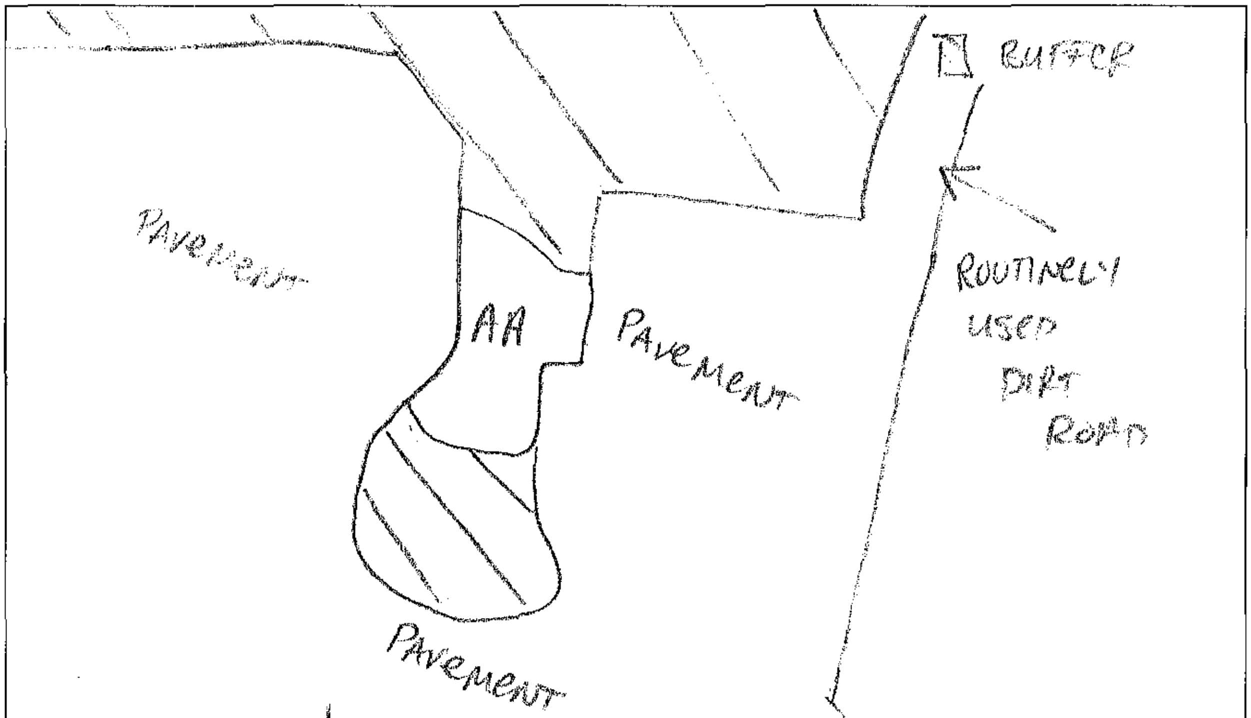
AA Name: VP04					Date: 5/25/18	
Attributes and Metrics			Alpha.	Numeric	**Comments**	
Attribute 1: Buffer and Landscape Context (pg. 7-15)						
(A) Aquatic Area Abundance			B	9		
	Alpha.	Numeric				
(B): Percent of AA with Buffer	C	6				
(C): Average Buffer Width	B	9				
(D): Buffer Condition	C	6			DISTURBED HABITAT, ROUTINELY MOWED (3x/yr)	
Initial Attribute Score= A + [D x (B x C)^{½}] ^{½}				16	**Final Attribute Score = (Initial Score/24) x 100**	65
Attribute 2: Hydrology (pg. 8-18)						
Water Source			C	6		
Hydroperiod			B	9	observed at survey: Fire Hose leaking into pool (temporary)	
Hydrologic Connectivity			C	6		
Initial Attribute Score= sum of metric scores			21		**Final Attribute Score = (Initial Score/36) x 100**	58
Attribute 3: Physical Structure (pg. 19-22)						
Structural Patch Richness			D	3		
Topographic Complexity			D	3		
Initial Attribute Score= sum of metric scores			6		**Final Attribute Score = (Initial Score/24) x 100**	25
Attribute 4: Biotic Structure (pg. 23-27)						
Horizontal Interspersion and Zonation			D	3		
	Alpha.	Numeric				
Plant Community submetric A: Number of Co-dominants	B	9				
Plant Community submetric B: Percent Non-native	D	3				
Plant Community submetric C: Endemic Species Richness	D	3				
Plant Community Composition Metric (*numeric average of submetrics A-C*)				7		
Initial Attribute Score= sum of metric scores			10		**Final Attribute Score = (Initial Score/24) x 100**	33
Overall AA Score (Average of four Final Attribute Scores)					45	

Worksheet 1: Aquatic Area Abundance Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	0 %
South	0 %
East	40 %
West	20 %
Average Percent Crossing Aquatic Area for all Four Transects ***Round to nearest integer***	15%

Worksheet 2: Percent of AA with Buffer

In the space provided below make a quick sketch of the AA, or on aerial the imagery, indicate where buffer is present, and record the total amount in the space provided.



Percent of AA with Buffer: 30 %

Worksheet 3: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	37
B	38
C	41
D	36
E	186
F	228
G	250
H	250
Average Buffer Width *Round to nearest integer*	133

Worksheet 4: Structural Patch Type for Individual Vernal Pools.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15.

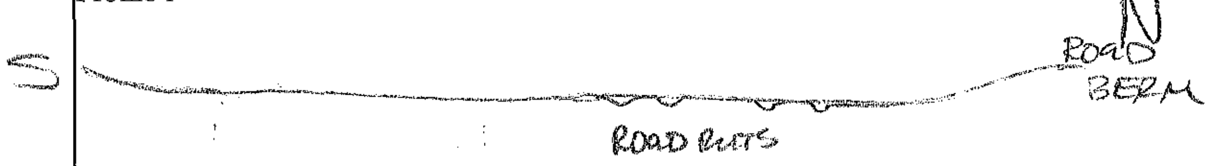
Structural Patch Type	Check for Presence	
Adjacent shrub or tree cover	0	
Animal mounds and burrows	0	
Bare soil (minimum 3 m ^{2})	0	
Cobble and boulders	1	<5%
Islands	0	
Mima mounds	0	
Patches of dense vegetation	0	
Soil cracks	0	
Within Pool Mounds	0	
Total Possible	9	
No. Observed Patch Types (use in Table 15)	1	

Worksheet 5: Sketches of Vernal Pool Profiles

Along the long axis of the pool and perpendicular to the long axis across the middle, make a sketch of the profile of the pool from its outside edge (1-3m landward or away from the saturated zone of the pool) to its deepest areas and back out to the opposite edge. Try to capture the major breaks in slope and the intervening micro-topographic relief.

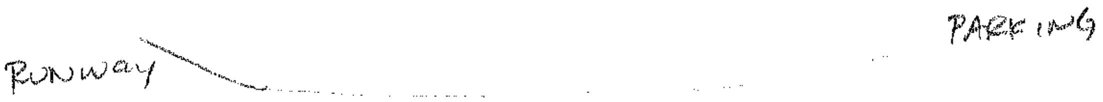
N-S

Profile 1



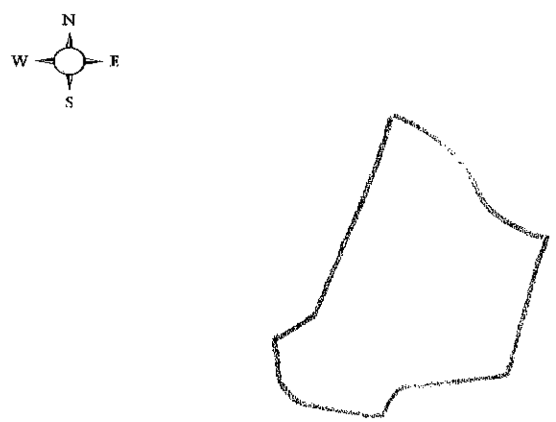
E-W

Profile 2



Worksheet 6: Sketches of Vernal Pool Plant Zones

Make a sketch-map of the vernal pool boundary plus the approximate locations of obvious plant zones. Compare the sketch-map to Figure 5 to score the pool with regard to horizontal Interspersion and zonation. Make special note of amount of shared edge.



Worksheet 7a: Plant Community Composition Metric –
Co-dominant Plant Species in Individual Vernal Pool

Note: A dominant species represents ≥10% *relative cover.* Count species only once when calculating any Plant Community Composition sub-metric. Use Appendix I to determine if a species is non-native and/or endemic.

Co-dominant Species	Check if Endemic	Check if non-native
BROMUS DIANDRA	—	✓
DIENANDRA FASCICULATA	—	—
ERODIUM CICUTARIUM	—	✓
HOLOCARPHA VIRGATA SSP. ELONGATA	—	—
Total Number of Co-dominants		4

Worksheet 7b: Plant Community Composition Metric – List of Unique Co-dominant Vernal Pool Endemic Plant Species

(A) Total number of co-dominant species (from worksheet 7a) (enter here and use in Table 19)	4
(B) Total number of co-dominant species that are non-native (from worksheet 7a)	2
Percent Non-native [(B)/(A) x 100] *Round to nearest integer* (enter here and use in Table 20)	50
Total number of co-dominant vernal pool endemic species based on Appendix I (enter here and use in Table 21)	0

Table 22: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Worksheet 8: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)	✓	LEAKING HOSE NO
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓	NO VEHICLE WASH, PAVEMENT RUNOFF
Flow diversions or unnatural inflows	—	—
Dams (reservoirs, detention basins, recharge basins)	—	—
Flow obstructions (culverts, paved stream crossings)	—	—
Weir/drop structure, tide gates	—	—
Dredged inlet/channel	—	—
Engineered channel (riprap, armored channel bank, bed)	—	—
Dike/levees	—	—
Groundwater extraction	—	—
Ditches (borrow, agricultural drainage, mosquito control, etc.)	—	—
Actively managed hydrology	—	—
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**	—	
Grading/ compaction **(N/A for restoration areas)**	✓	VEHICLE OCCASIONAL NOT LIKELY
Plowing/Discing **(N/A for restoration areas)**	—	
Resource extraction (sediment, gravel, oil and/or gas)	—	
Vegetation management	✓	MOWING/3X/YR /YES
Excessive sediment or organic debris from watershed	—	
Excessive runoff from watershed	—	
Nutrient impaired (PS or Non-PS pollution)	—	
Heavy metal impaired (PS or Non-PS pollution)	—	
Pesticides or trace organics impaired (PS or Non-PS pollution)	✓	SPRAY ADJACENT/ON ROADWAY / NO
Bacteria and pathogens impaired (PS or Non-PS pollution)	—	
Trash or refuse	✓	NOT LIKELY
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	✓	mow 3x yr / yes
Excessive human visitation	—	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	—	
Tree cutting/sapling removal	—	
Removal of woody debris	—	
Treatment of non-native and nuisance plant species	✓	NO
Pesticide application or vector control	✓	RAT TRAPS / NO
Biological resource extraction or stocking (fisheries, aquaculture)	—	
Excessive organic debris in matrix (for vernal pools)	—	
Lack of vegetation management to conserve natural resources	✓	NO NO TREATMENT / YES
Lack of treatment of invasive plants adjacent to AA or buffer	✓	YES
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential	—	
Industrial/commercial	✓	In airport in comm. area.
Military training/Air traffic	✓	In airport
Dams (or other major flow regulation or disruption)	—	
Dryland farming	—	
Intensive row-crop agriculture	—	
Orchards/nurseries	—	
Commercial feedlots	—	
Dairies	—	
Ranching (enclosed livestock grazing or horse paddock or feedlot)	—	
Transportation corridor	✓	In airport.
Rangeland (livestock rangeland also managed for native vegetation)	—	
Sports fields and urban parklands (golf courses, soccer fields, etc.)	—	
Passive recreation (bird-watching, hiking, etc.)	—	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	—	
Physical resource extraction (rock, sediment, oil/gas)	—	
Biological resource extraction (aquaculture, commercial fisheries)	—	
Comments		

Basic Information: Individual Vernal Pool

Assessment Area Name: VERNAL POOL 6
Project Name: FIRE OPS
Assessment Area ID #: FOVP 6
Project ID #: S-15012 Date: 5/25/18

Assessment Team Members for This AA

SEAN PAPER, CINDY DUNN, MAYA MAZON, DOUGLAS ALLEN

AA Location:
Latitude: 32°49' 05.22" N Longitude: 117° 08' 07.49" W Datum: WGS 1985

Wetland Category:
☒ Natural ☐ Constructed ☐ Restoration (Rehabilitation OR Enhancement)

If Created or Restored, does the action encompass:
☐ entire wetland ☐ portion of the wetland

What best describes the hydrologic state of the wetland at the time of assessment?
☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?
☐ long-duration ☐ medium-duration ☒ short-duration

Does the vernal pool system connect with the floodplain of a nearby stream?
☐ yes ☒ no

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North	32°49'05.86"N	117°08'07.22" W	WGS 1984
2		South	32° 49' 04.55"N	117° 08' 07.76"W	WGS 1984
3		East	32° 49' 05.19"N	117° 08' 07.11"W	WGS 1984
4		West	32° 49' 05.35"N	117° 08' 07.96"W	WGS 1984
5					
6					

Comments:

Scoring Sheet: Individual Vernal Pools

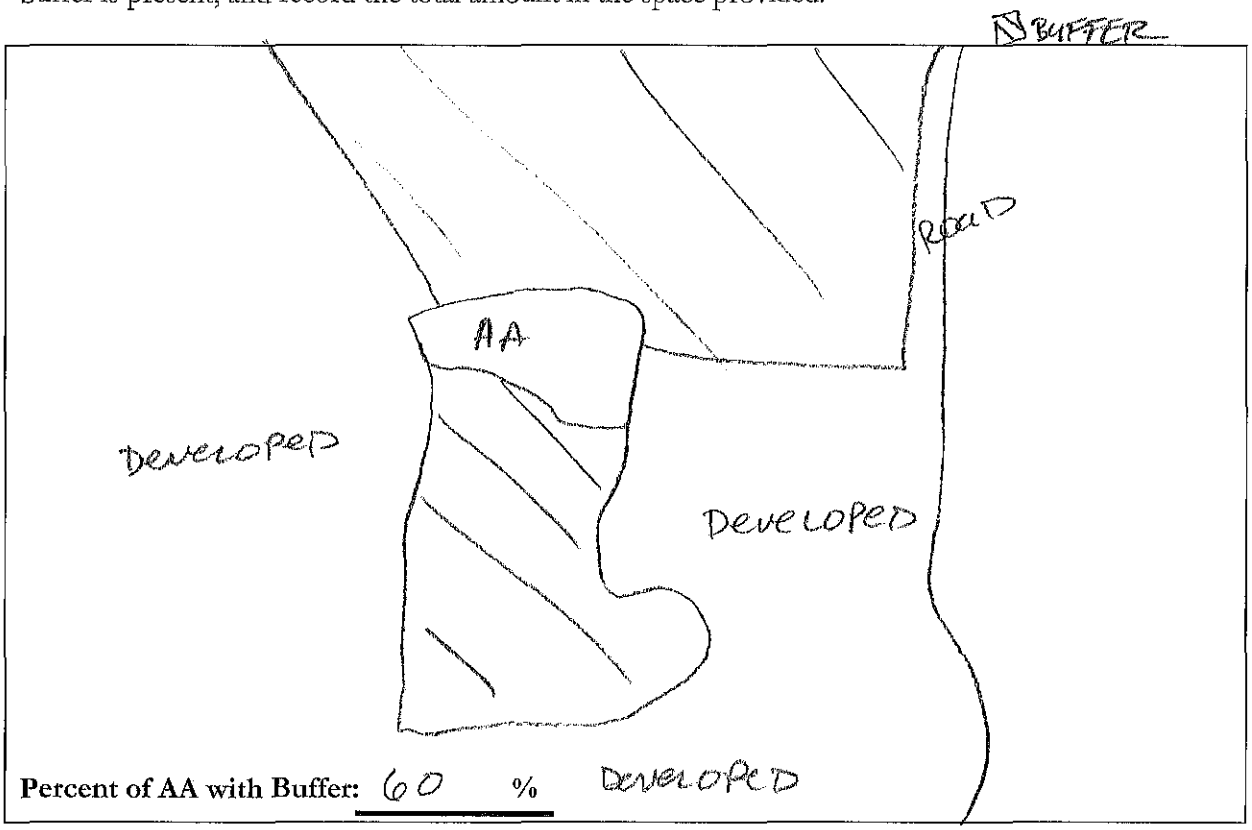
AA Name:					Date:	
Attributes and Metrics			Alpha.	Numeric	**Comments**	
Attribute 1: Buffer and Landscape Context (pg. 7-15)						
(A) Aquatic Area Abundance			B	9		
	Alpha.	Numeric				
(B): Percent of AA with Buffer	B	9				
(C): Average Buffer Width	B	9				
(D): Buffer Condition	C	6				
Initial Attribute Score= A + [D x (B x C)^{½}] ^{½}				16	**Final Attribute Score = (Initial Score/24) x 100**	68
Attribute 2: Hydrology (pg. 8-18)						
Water Source			C	6		
Hydroperiod			B	9		
Hydrologic Connectivity			C	6		
Initial Attribute Score= sum of metric scores			21		**Final Attribute Score = (Initial Score/36) x 100**	58
Attribute 3: Physical Structure (pg. 19-22)						
Structural Patch Richness			D	3		
Topographic Complexity			D	3		
Initial Attribute Score= sum of metric scores			6		**Final Attribute Score = (Initial Score/24) x 100**	25
Attribute 4: Biotic Structure (pg. 23-27)						
Horizontal Interspersion and Zonation			D	3		
	Alpha.	Numeric				
Plant Community submetric A: Number of Co-dominants	C	6				
Plant Community submetric B: Percent Non-native	D	3				
Plant Community submetric C: Endemic Species Richness	D	3				
Plant Community Composition Metric (*numeric average of submetrics A-C*)				4		
Initial Attribute Score= sum of metric scores			7		**Final Attribute Score = (Initial Score/24) x 100**	29
Overall AA Score (Average of four Final Attribute Scores)					45	

Worksheet 1: Aquatic Area Abundance Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	0%
South	10%
East	45%
West	25%
Average Percent Crossing Aquatic Area for all Four Transects ***Round to nearest integer***	20%

Worksheet 2: Percent of AA with Buffer

In the space provided below make a quick sketch of the AA, or on aerial the imagery, indicate where buffer is present, and record the total amount in the space provided.



Percent of AA with Buffer: 60 %

Worksheet 3: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	106
B	104
C	96
D	147
E	181
F	229
G	250
H	250
Average Buffer Width ***Round to nearest integer***	170

Worksheet 4: Structural Patch Type for Individual Vernal Pools.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15.

Structural Patch Type	Check for Presence
Adjacent shrub or tree cover	⊖
Animal mounds and burrows	⊖
Bare soil (minimum 3 m ^{2})	⊖
Cobble and boulders	1
Islands	⊖
Mima mounds	⊖
Patches of dense vegetation	⊖
Soil cracks	⊖
Within Pool Mounds	⊖
Total Possible	9
No. Observed Patch Types (use in Table 15)	1

Worksheet 5: Sketches of Vernal Pool Profiles

Along the long axis of the pool and perpendicular to the long axis across the middle, make a sketch of the profile of the pool from its outside edge (1-3m landward or away from the saturated zone of the pool) to its deepest areas and back out to the opposite edge. Try to capture the major breaks in slope and the intervening micro-topographic relief.

Profile 1 W → E

Profile 2 N → S

Worksheet 6: Sketches of Vernal Pool Plant Zones

Make a sketch-map of the vernal pool boundary plus the approximate locations of obvious plant zones. Compare the sketch-map to Figure 5 to score the pool with regard to horizontal Interspersion and zonation. Make special note of amount of shared edge.

Worksheet 7a: Plant Community Composition Metric –
Co-dominant Plant Species in Individual Vernal Pool

Note: A dominant species represents ≥10% *relative cover.* Count species only once when calculating any Plant Community Composition sub-metric. Use Appendix I to determine if a species is non-native and/or endemic.

Co-dominant Species	Check if Endemic	Check if non-native
BROMUS DIANDRUS	—	✓
DIENANDRA FASCICULATA	—	—
ERODIUM CICUTARIUM	—	✓
Total Number of Co-dominants	→	3

Worksheet 7b: Plant Community Composition Metric – List of Unique Co-dominant Vernal Pool Endemic Plant Species

(A) Total number of co-dominant species (from worksheet 7a) (enter here and use in Table 19)	3
(B) Total number of co-dominant species that are non-native (from worksheet 7a)	2
Percent Non-native [(B)/(A) x 100] *Round to nearest integer* (enter here and use in Table 20)	66
Total number of co-dominant vernal pool endemic species based on Appendix I (enter here and use in Table 21)	0

Table 22: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Worksheet 8: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)	—	
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓	NO (VEHICLE WASH, PAVEMENT RUNOFF)
Flow diversions or unnatural inflows	—	
Dams (reservoirs, detention basins, recharge basins)	—	
Flow obstructions (culverts, paved stream crossings)	—	
Weir/drop structure, tide gates	—	
Dredged inlet/channel	—	
Engineered channel (riprap, armored channel bank, bed)	—	
Dike/levees	—	
Groundwater extraction	—	
Ditches (borrow, agricultural drainage, mosquito control, etc.)	—	
Actively managed hydrology	—	

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**	—	
Grading/ compaction **(N/A for restoration areas)**	✓	NOT LIKELY (VEHICLE OCCASIONAL)
Plowing/Discing **(N/A for restoration areas)**	—	
Resource extraction (sediment, gravel, oil and/or gas)	—	
Vegetation management	✓	Yes (mowing - 3x/yR)
Excessive sediment or organic debris from watershed	—	
Excessive runoff from watershed	—	
Nutrient impaired (PS or Non-PS pollution)	—	
Heavy metal impaired (PS or Non-PS pollution)	—	
Pesticides or trace organics impaired (PS or Non-PS pollution)	✓	NO (SPRAY ON ADJACENT RUNWAY)
Bacteria and pathogens impaired (PS or Non-PS pollution)	—	
Trash or refuse	✓	NOT LIKELY

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	✓	Yes (mow - 3x/yr.)
Excessive human visitation	—	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	—	
Tree cutting/sapling removal	—	
Removal of woody debris	—	
Treatment of non-native and nuisance plant species	✓	NO
Pesticide application or vector control	✓	NO (RAT TRAPS)
Biological resource extraction or stocking (fisheries, aquaculture)	—	
Excessive organic debris in matrix (for vernal pools)	—	
Lack of vegetation management to conserve natural resources	✓	YES (NO TREATMENT OF NN species)
Lack of treatment of invasive plants adjacent to AA or buffer	✓	yes
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential	—	
Industrial/commercial	✓	In airport surrounded by comm. area
Military training/Air traffic	✓	In airport
Dams (or other major flow regulation or disruption)	—	
Dryland farming	—	
Intensive row-crop agriculture	—	
Orchards/nurseries	—	
Commercial feedlots	—	
Dairies	—	
Ranching (enclosed livestock grazing or horse paddock or feedlot)	—	
Transportation corridor	✓	In airport
Rangeland (livestock rangeland also managed for native vegetation)	—	
Sports fields and urban parklands (golf courses, soccer fields, etc.)	—	
Passive recreation (bird-watching, hiking, etc.)	—	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	—	
Physical resource extraction (rock, sediment, oil/gas)	—	
Biological resource extraction (aquaculture, commercial fisheries)	—	
Comments		

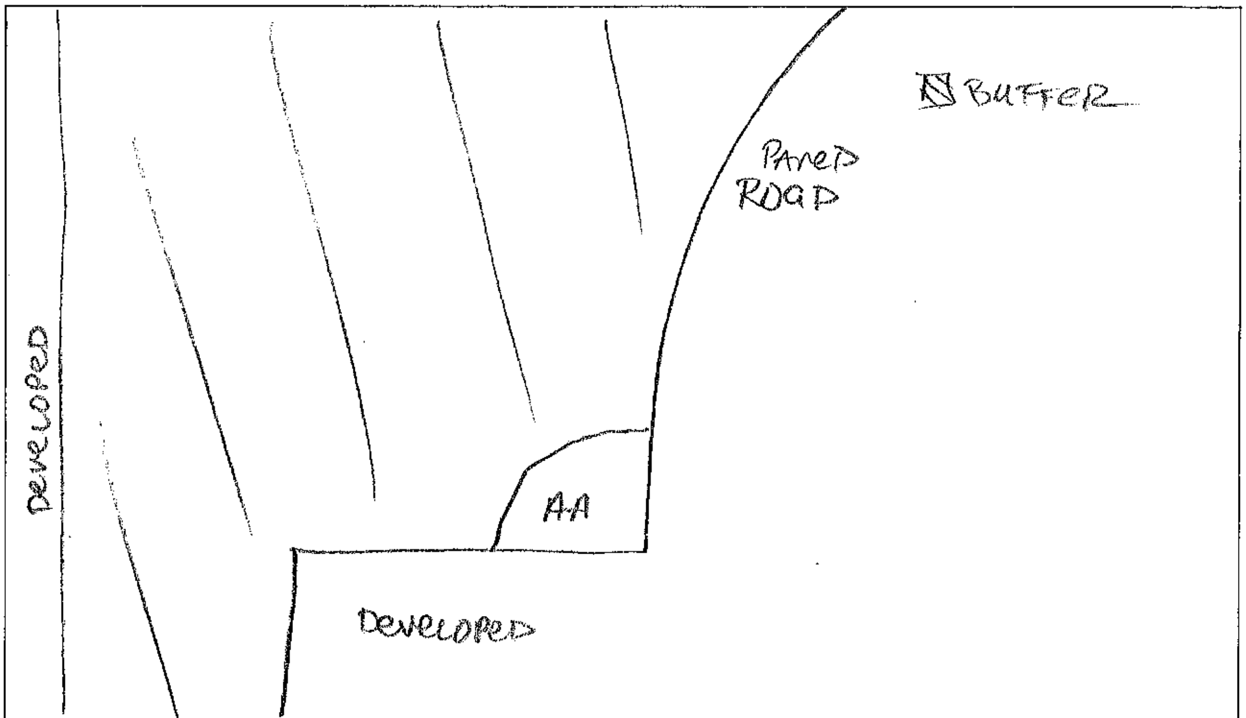
Scoring Sheet: Individual Vernal Pools

AA Name: FOVP9			Date: 5/25/18
Attributes and Metrics	Alpha.	Numeric	**Comments**
Attribute 1: Buffer and Landscape Context (pg. 7-15)			
(A) Aquatic Area Abundance	A	12	
	Alpha.	Numeric	
(B): Percent of AA with Buffer	C	6	
(C): Average Buffer Width	A	12	
(D): Buffer Condition	C	6	
Initial Attribute Score= $A + [D \times (B \times C)^{½}]^{½}$		19	**Final Attribute Score = (Initial Score/24) x 100** 79
Attribute 2: Hydrology (pg. 8-18)			
Water Source	B	9	
Hydroperiod	B	9	NEARBY RUNOFF FROM BUILDING GOES TO VERNAL POOL
Hydrologic Connectivity	C	6	
Initial Attribute Score= sum of metric scores	24		**Final Attribute Score = (Initial Score/36) x 100** 67
Attribute 3: Physical Structure (pg. 19-22)			
Structural Patch Richness	D	3	
Topographic Complexity	D	3	
Initial Attribute Score= sum of metric scores	6		**Final Attribute Score = (Initial Score/24) x 100** 25
Attribute 4: Biotic Structure (pg. 23-27)			
Horizontal Interspersion and Zonation	D	3	
	Alpha.	Numeric	
Plant Community submetric A: Number of Co-dominants	B	9	
Plant Community submetric B: Percent Non-native	D	3	
Plant Community submetric C: Endemic Species Richness	D	3	
Plant Community Composition Metric (*numeric average of submetrics A-C*)		5	
Initial Attribute Score= sum of metric scores	8		**Final Attribute Score = (Initial Score/24) x 100** 33
Overall AA Score (Average of four Final Attribute Scores)			51

Worksheet 1: Aquatic Area Abundance Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	~~20%~~ 10%
South	~~75%~~ 55%
East	~~20%~~ 45%
West	~~0%~~ 10%
Average Percent Crossing Aquatic Area for all Four Transects ***Round to nearest integer***	~~29%~~ 30%

Worksheet 2: Percent of AA with Buffer
In the space provided below make a quick sketch of the AA, or on aerial the imagery, indicate where buffer is present, and record the total amount in the space provided.



Percent of AA with Buffer: 45 %

Worksheet 5: Sketches of Vernal Pool Profiles

Along the long axis of the pool and perpendicular to the long axis across the middle, make a sketch of the profile of the pool from its outside edge (1-3m landward or away from the saturated zone of the pool) to its deepest areas and back out to the opposite edge. Try to capture the major breaks in slope and the intervening micro-topographic relief.

N–S

Profile 1
Profile 2 E→W

Worksheet 6: Sketches of Vernal Pool Plant Zones

Make a sketch-map of the vernal pool boundary plus the approximate locations of obvious plant zones. Compare the sketch-map to Figure 5 to score the pool with regard to horizontal Interspersion and zonation. Make special note of amount of shared edge.

Worksheet 7b: Plant Community Composition Metric – List of Unique Co-dominant Vernal Pool Endemic Plant Species

(A) Total number of co-dominant species (from worksheet 7a) (enter here and use in Table 19)	5
(B) Total number of co-dominant species that are non-native (from worksheet 7a)	3
Percent Non-native [(B)/(A) x 100] *Round to nearest integer* (enter here and use in Table 20)	60%
Total number of co-dominant vernal pool endemic species based on Appendix I (enter here and use in Table 21)	1

Table 22: Wetland disturbances and conversions.

<table>
<tr><td>Has a major disturbance occurred at this wetland?</td><td>Yes</td><td colspan="2">No</td><td colspan="2"></td><td></td></tr>
<tr><td>If yes, was it a flood, fire, landslide, or other?</td><td>flood</td><td colspan="2">fire</td><td colspan="2">landslide</td><td>other</td></tr>
<tr><td>If yes, then how severe is the disturbance?</td><td colspan="2">likely to affect site next 5 or more years</td><td colspan="2">likely to affect site next 3-5 years</td><td colspan="2">likely to affect site next 1-2 years</td></tr>
<tr><td rowspan="4">Has this wetland been converted from another type? If yes, then what was the previous type?</td><td colspan="2">depressional</td><td colspan="2">vernal pool</td><td colspan="2">vernal pool system</td></tr>
<tr><td colspan="2">non-confined riverine</td><td colspan="2">confined riverine</td><td colspan="2">bar-built estuarine</td></tr>
<tr><td colspan="2">perennial saline estuarine</td><td colspan="2">perennial non-saline estuarine</td><td colspan="2">wet meadow</td></tr>
<tr><td colspan="2">lacustrine</td><td colspan="2">seep or spring</td><td colspan="2">playa</td></tr>
</table>

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	✓	Yes
Excessive human visitation	✓	YES
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	—	
Tree cutting/sapling removal	—	
Removal of woody debris	—	
Treatment of non-native and nuisance plant species	—	
Pesticide application or vector control	—	
Biological resource extraction or stocking (fisheries, aquaculture)	—	
Excessive organic debris in matrix (for vernal pools)	—	
Lack of vegetation management to conserve natural resources	✓	YES
Lack of treatment of invasive plants adjacent to AA or buffer	✓	YES
Comments		

ADJACENT TO PARKING

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information: Individual Vernal Pool

Assessment Area Name: VERNAL POOL 7
Project Name: FIRE OPS
Assessment Area ID #: FOVP 7
Project ID #: S-15012 Date: 5/25/18

Assessment Team Members for This AA

SEAN PAVER, CINDY DUNN, MAYA MAZON, DOUGLAS ALLEN

AA Location:
Latitude: 32° 49' 06.14" N Longitude: 117° 08' 05" W Datum: WGS 1985

Wetland Category:
☐ Natural ☒ Constructed ☐ Restoration (Rehabilitation OR Enhancement)
DEPRESSION MAY HAVE BEEN CAUSED BY VEHICLE COMPACTION

If Created or Restored, does the action encompass:
☐ entire wetland ☐ portion of the wetland

What best describes the hydrologic state of the wetland at the time of assessment?
☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?
☐ long-duration ☐ medium-duration ☒ short-duration

Does the vernal pool system connect with the floodplain of a nearby stream?
☐ yes ☒ no

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North	32° 49' 06.73" N	117° 08' 05.53" W	WGS 1985
2		South	32° 49' 04.39" N	117° 08' 06.10" W	WGS 1985
3		East	32° 49' 06.09" N	117° 08' 06.77" W	WGS 1985
4		West	32° 49' 05.72" N	117° 08' 04.61" W	WGS 1985
5					
6					

Comments:

Scoring Sheet: Individual Vernal Pools

AA Name: FOVP7					Date: 5/25/14	
Attributes and Metrics			Alpha.	Numeric	**Comments**	
Attribute 1: Buffer and Landscape Context (pg. 7-15)						
(A) Aquatic Area Abundance			A	12		
	Alpha.	Numeric				
(B): Percent of AA with Buffer	A	12				
(C): Average Buffer Width	B	9				
(D): Buffer Condition	C	6				
Initial Attribute Score= A + [D x (B x C)$^{1/2}$] $^{1/2}$				20	**Final Attribute Score = (Initial Score/24) x 100**	83
Attribute 2: Hydrology (pg. 8-18)						
Water Source			B	9		
Hydroperiod			B	9	NEARBY RUNOFF FROM BUILDING GOES TO VERNAL POOL	
Hydrologic Connectivity			B	9		
Initial Attribute Score= sum of metric scores			27		**Final Attribute Score = (Initial Score/36) x 100**	75
Attribute 3: Physical Structure (pg. 19-22)						
Structural Patch Richness			D	3		
Topographic Complexity			D	3		
Initial Attribute Score= sum of metric scores			6		**Final Attribute Score = (Initial Score/24) x 100**	25
Attribute 4: Biotic Structure (pg. 23-27)						
Horizontal Interspersion and Zonation			D	3		
	Alpha.	Numeric				
Plant Community submetric A: Number of Co-dominants	C	6				
Plant Community submetric B: Percent Non-native	B	9				
Plant Community submetric C: Endemic Species Richness	D	3				
Plant Community Composition Metric (*numeric average of submetrics A-C*)				6		
Initial Attribute Score= sum of metric scores			9		**Final Attribute Score = (Initial Score/24) x 100**	38
Overall AA Score (Average of four Final Attribute Scores)					55	

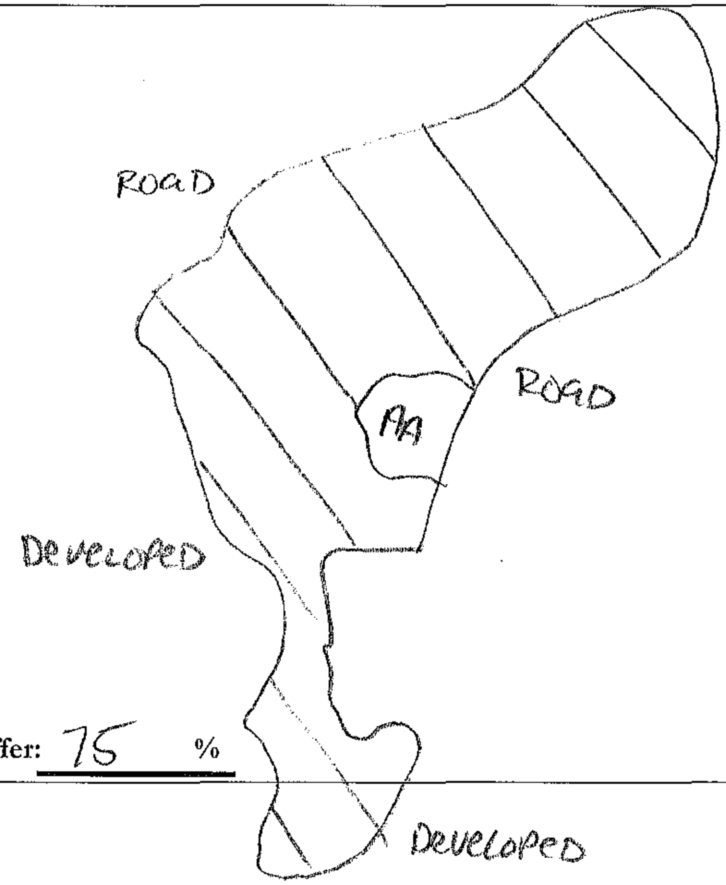
Worksheet 1: Aquatic Area Abundance Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	20%
South	60%
East	35%
West	10%
Average Percent Crossing Aquatic Area for all Four Transects ***Round to nearest integer***	31%

Worksheet 2: Percent of AA with Buffer

In the space provided below make a quick sketch of the AA, or on aerial the imagery, indicate where buffer is present, and record the total amount in the space provided.

☒ Buffer



Percent of AA with Buffer: 75 %

Worksheet 3: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	80
B	70
C	95
D	153
E	174
F	217
G	322
H	21
Average Buffer Width ***Round to nearest integer***	141

Worksheet 4: Structural Patch Type for Individual Vernal Pools.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15.

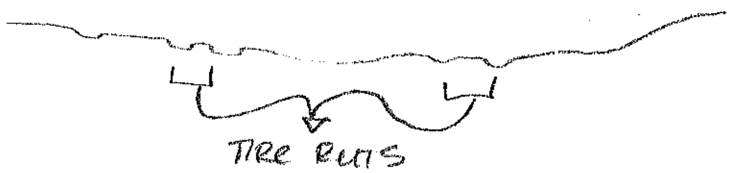
Structural Patch Type	Check for Presence
Adjacent shrub or tree cover	—
Animal mounds and burrows	—
Bare soil (minimum 3 m ^{2})	—
Cobble and boulders	✓
Islands	—
Mima mounds	—
Patches of dense vegetation	—
Soil cracks	—
Within Pool Mounds	—
Total Possible	9
No. Observed Patch Types (use in Table 15)	1

Worksheet 5: Sketches of Vernal Pool Profiles

Along the long axis of the pool and perpendicular to the long axis across the middle, make a sketch of the profile of the pool from its outside edge (1-3m landward or away from the saturated zone of the pool) to its deepest areas and back out to the opposite edge. Try to capture the major breaks in slope and the intervening micro-topographic relief.

N-S

Profile 1

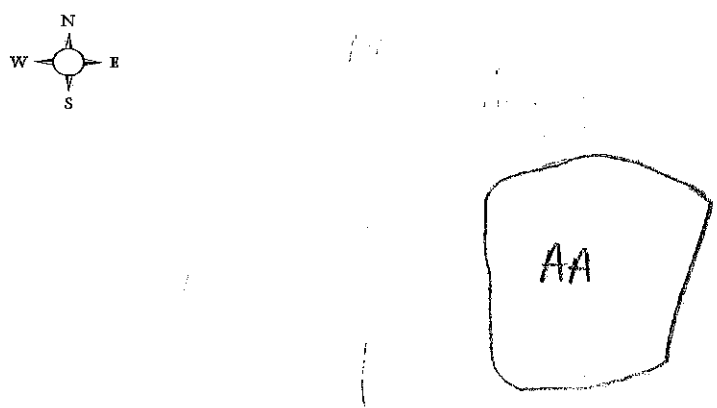


Profile 2

E → W

Worksheet 6: Sketches of Vernal Pool Plant Zones

Make a sketch-map of the vernal pool boundary plus the approximate locations of obvious plant zones. Compare the sketch-map to Figure 5 to score the pool with regard to horizontal Interspersion and zonation. Make special note of amount of shared edge.



Worksheet 7a: Plant Community Composition Metric –
Co-dominant Plant Species in Individual Vernal Pool

Note: A dominant species represents ≥10% *relative cover.* Count species only once when calculating any Plant Community Composition sub-metric. Use Appendix I to determine if a species is non-native and/or endemic.

Co-dominant Species	Check if Endemic	Check if non-native
ERIODIUM CICUTARIUM	—	✓
Holocarpha virgata ssp. elongata	—	—
Psilocarphus brevissimus	✓	—
Total Number of Co-dominants		3

Worksheet 7b: Plant Community Composition Metric – List of Unique Co-dominant Vernal Pool Endemic Plant Species

(A) Total number of co-dominant species (from worksheet 7a) (enter here and use in Table 19)	3
(B) Total number of co-dominant species that are non-native (from worksheet 7a)	1
Percent Non-native [(B)/(A) x 100] ***Round to nearest integer*** **(enter here and use in Table 20)**	33
Total number of co-dominant vernal pool endemic species based on Appendix I (enter here and use in Table 21)	1

Table 22: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Worksheet 8: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA	
Point Source (PS) discharges (POTW, other non-stormwater discharge)	—		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓	NO	PARKING LOT
Flow diversions or unnatural inflows	—		
Dams (reservoirs, detention basins, recharge basins)	—		
Flow obstructions (culverts, paved stream crossings)	—		
Weir/drop structure, tide gates	—		
Dredged inlet/channel	—		
Engineered channel (riprap, armored channel bank, bed)	—		
Dike/levees	—		
Groundwater extraction	—		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	—		
Actively managed hydrology			
Comments			

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA	
Filling or dumping of sediment or soils **(N/A for restoration areas)**	—		
Grading/ compaction **(N/A for restoration areas)**	✓	YES	HISTORICAL PARKING / DRIVING
Plowing/Discing **(N/A for restoration areas)**	—		
Resource extraction (sediment, gravel, oil and/or gas)	—		
Vegetation management	—		
Excessive sediment or organic debris from watershed	—		
Excessive runoff from watershed	—		
Nutrient impaired (PS or Non-PS pollution)	—		
Heavy metal impaired (PS or Non-PS pollution)	—		
Pesticides or trace organics impaired (PS or Non-PS pollution)	—		
Bacteria and pathogens impaired (PS or Non-PS pollution)			
Trash or refuse	✓	NO	
Comments			

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	✓	Yes
Excessive human visitation	✓	YES ADJACENT TO PARKING
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	—	
Tree cutting/sapling removal	—	
Removal of woody debris	—	
Treatment of non-native and nuisance plant species	—	
Pesticide application or vector control	—	
Biological resource extraction or stocking (fisheries, aquaculture)	—	
Excessive organic debris in matrix (for vernal pools)	—	
Lack of vegetation management to conserve natural resources	✓	YES
Lack of treatment of invasive plants adjacent to AA or buffer	✓	YES

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential	—	
Industrial/commercial	✓	In airport surrounded by comm. area
Military training/Air traffic	✓	In airport
Dams (or other major flow regulation or disruption)	—	
Dryland farming	—	
Intensive row-crop agriculture	—	
Orchards/nurseries	—	
Commercial feedlots	—	
Dairies	—	
Ranching (enclosed livestock grazing or horse paddock or feedlot)	—	
Transportation corridor	✓	In airport
Rangeland (livestock rangeland also managed for native vegetation)	—	
Sports fields and urban parklands (golf courses, soccer fields, etc.)	—	
Passive recreation (bird-watching, hiking, etc.)	—	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	—	
Physical resource extraction (rock, sediment, oil/gas)	—	
Biological resource extraction (aquaculture, commercial fisheries)	—	

Comments

APPENDIX B

PHOTO DOCUMENTATION

Appendix B: CRAM Photopoint Locations

Fire Rescue Air Operations Phase II

Appendix B
Photo Documentation

Photo 1. Wet Season: Vernal Pool 4 (FOVP4) observed on March 19, 2018 within the Project Area facing west

Photo 2. Dry Season: Vernal Pool 4 (FOVP4) observed within the Project Area facing northwest.

Appendix B
Photo Documentation

Photo 3. Dry Season: Vernal Pool 4 (FOVP4) observed within the Project Area facing northeast.

Photo 4. Dry Season: Vernal Pool 4 (FOVP4) observed within the Project Area facing southeast.

Appendix B
Photo Documentation

Photo 5. Dry Season: Vernal Pool 4 (FOVP4) observed within the Project Area facing southwest.

Photo 6. Wet Season: Vernal Pool 6 (right-FOVP6) and Vernal Pool 4 (left-FOVP4) observed on January 10, 2018 within the Project Area facing northeast.

Appendix B
Photo Documentation

Photo 7. Dry Season: Vernal Pool 6 (FOVP6) observed within the Project Area facing northeast.

Photo 8. Dry Season: Vernal Pool 6 (FOVP6) observed within the Project Area facing south.

Photo 9. Dry Season: Vernal Pool 6 (FOVP6) observed within the Project Area facing southwest.

Photo 10. Dry Season: Vernal Pool 6 (FOVP6) observed within the Project Area facing northwest.

Photo 11. Dry Season: Vernal Pool 7 (FOVP7) observed within the Project Area facing northeast.

Photo 12. Dry Season: Vernal Pool 7 (FOVP7) observed within the Project Area facing southeast.

Appendix B
Photo Documentation

Photo 13. Dry Season: Vernal Pool 7 (FOVP7) observed within the Project Area facing southwest.

Photo 14. Dry Season: Vernal Pool 7 (FOVP7) observed within the Project Area facing northwest.

Appendix B
Photo Documentation

Photo 15. Dry Season: Vernal Pool 9 (FOVP9) observed within the Project Area facing northwest.

Photo 16. Dry Season: Vernal Pool 9 (FOVP9) observed within the Project Area facing southeast.

Photo 17. Dry Season: Vernal Pool 9 (FOVP9) observed within the Project Area facing southwest.

APPENDIX G

2016 BURROWING OWL HABITAT ASSESSMENT

SUMMARY REPORT

September 9, 2016

Ms. Esther Burkett
California Department of Fish and Wildlife
Wildlife Branch - Nongame Wildlife
1812 9th Street
Sacramento, CA 95811

RE: 2016 BURROWING OWL HABITAT ASSESSMENT SUMMARY REPORT FOR THE FIRE RESCUE AIR OPERATIONS FACILITY, MONTGOMERY FIELD AIRPORT, CITY OF SAN DIEGO, CALIFORNIA

Ms. Burkett:

Busby Biological Services, Inc. (BBS) was contracted by RECON Environmental, Inc. (RECON) to conduct a focused habitat assessment for burrowing owl (*Athena cunicularia*) for the proposed Fire Rescue Air Operations Facility Project (Proposed Project) at Montgomery Field Airport in the City of San Diego, California (Attachment 1: Figures 1 through 3). This survey summary report provides brief project background information, burrowing owl species and historical occurrence information, habitat assessment methods, and results/discussion.

1.0 PROPOSED PROJECT DESCRIPTION AND LOCATION

The City of San Diego (City) Public Works Department (PWD) proposes to construct a new, permanent Fire Rescue Air Operations Facility at Montgomery Field Airport to accommodate the emergency helicopters and crews that are on-call during all hours, every day of the year, to provide fire suppression, emergency rescues from remote areas, advanced life support, and medical transport. The Proposed Project is composed of the following two components: (1) Construction Site, where construction of the new, permanent Fire Rescue Air Operations facility will take place and (2) Demolition Site, where demolition of the existing, temporary Fire Rescue Air Operations building will take place (Attachment 1: Figure 3). The Proposed Project is still in the planning stages. However, conceptual drawings for the proposed new facilities have been prepared, and the City has requested a biological constraints analysis based on the conceptual Proposed Project design footprint.

The Construction and Demolition Sites of the Proposed Project are both located entirely within Montgomery Field Airport, on both developed and undeveloped lands within Assessor's Parcel Number (APN) 421-290-11-00 in the U.S. Geological Survey (USGS) La Jolla 7.5-minute quadrangle (USGS 1996) in the City of San Diego, County of San Diego, California (Attachment 1: Figures 1 and 2). Montgomery Field Airport is bounded to the north by commercial development along the south side of Balboa Avenue, to the east by commercial development along the west side of Ruffin Road, to the south by Aero Drive, and to the west by Kearny Villa Road (Attachment 1: Figures 2 and 3).

The focused burrowing owl habitat assessment was conducted for the Proposed Project footprint as well as a 500-foot buffer around the footprint, collectively referred to as the Burrowing Owl Habitat Assessment Area in this report. The approximately 59-acre Burrowing Owl Habitat Assessment Area is composed of the approximately 36.9-acre Construction Site Assessment Area (i.e., the approximately 0.23-acre Proposed Project impact area and a 500-foot assessment buffer) and the approximately 22.1-acre Demolition Site Assessment Area (i.e., the approximately 0.23-acre Proposed Project impact area and a 500-foot assessment buffer).

2.0 BURROWING OWL SPECIES & HISTORICAL OCCURRENCE INFORMATION

The burrowing owl is a California Department of Fish and Wildlife (CDFW) Species of Special Concern and a City of San Diego Multiple Species Conservation Program (MSCP)-covered species. This section provides species-specific information about the burrowing owl range and migration patterns, habitat, breeding information, and population threats.

2.1 Burrowing Owl Range & Migration Patterns

The burrowing owl ranges from southwestern Canada and the western United States, south through Central America, and into the northernmost portion of South America as well as the southern half of South America. It can also be found on coastal islands off of Florida and Baja California, Mexico (Haug et al. 1993). The northernmost populations of this species are almost completely migratory, and wintering birds can be found south to southern Mexico.

The western subspecies of burrowing owl (*A. c. hypugaea*) includes the populations that occur in southern Alberta, Canada, and within the western United States. In California, the western burrowing owl is found throughout the state, with the exception of the northern coast and eastern Sierra Nevada Mountains (Shuford and Gardali 2008). This subspecies remains fairly common in the Imperial Valley, which is home to nearly 70 percent of the entire California population; however, this species is rapidly declining in the remainder of the California populations (Unitt 2004). While the northern populations are often migratory, southern California burrowing owls are only partially migratory as evidenced by reduced population sizes in winter, with some birds remaining on territories throughout the year.

The burrowing owl has disappeared and/or populations have declined in several southern California and San Francisco Bay area counties and in coastal areas throughout California, as they have in other regions throughout the United States and Canada (DeSante et al. 1997, Klute et al. 2003). During the late 1800s and early 1900s, the burrowing owl was widespread and common in San Diego County, primarily along the coast and into the grassy interior; however, by the 1970s, the burrowing owl was considered uncommon and declining in these areas (Unitt 2004; Bent 1961). The burrowing owl currently occupies some historical sites in San Diego County (e.g., Naval Air Station North Island, south San Diego coastal area, and Otay Mesa) in much reduced numbers and is believed to be absent from many developed areas that it formerly occupied (e.g., north-central San Diego County, coastal areas, and the area around the City of San Diego) (Unitt 2004; Lincer and Bloom 2007). As of 2007, an estimated 41 to 46 pairs breed and 148 to 168 local individuals winter within San Diego County (Lincer and Bloom 2007). During the winter, local wintering burrowing owls are joined by migratory wintering burrowing owls to form a total estimated wintering population of approximately 300 to 370 individuals (Lincer and Bloom 2007).

2.2 Burrowing Owl Habitat

The burrowing owl is a ground-dwelling raptor that requires open, relatively flat terrain with burrows for nesting, roosting, and cover (CDFW 2012). This species can be found in a variety of habitat types that contain suitable burrowing and foraging habitat, including – but not limited to – native and non-native grassland, shrub steppe, shrubland with low density shrub cover, desert, agricultural, golf courses, drainage ditches, earthen berms, pasturelands, fallow fields, and even ruderal areas and vacant lots (Gervais et al. 2008, CDFW 2012). The burrowing owl is typically associated with areas containing well-drained, friable soils inhabited by fossorial mammals (Haug et al. 1993, CDFW 2012).

In California, the burrowing owl prefers habitat with short, sparse vegetation and few shrubs, level to gentle topography, and well-drained soils (Haug et al. 1993). In San Diego County, the burrowing owl typically inhabits coastal lowlands in grasslands, agricultural areas, and coastal dunes (Unitt 2004).

In addition to burrowing habitat, the burrowing owl requires ample foraging habitat surrounding its burrows. This species concentrates it foraging within approximately 2,000 feet of its burrow, which equates to an area of up to approximately 300 acres (Haug and Oliphant 1990, Rosenberg and Haley 2004); however, the burrowing owl is known to use much smaller patch sizes, especially when they are located adjacent to suitable breeding and/or foraging habitat. Preferred foraging habitat consists of dry, open, relatively flat expanses with short grasses and sparse shrub cover (Ehrlich et al. 1988).

Although the burrowing owl may dig its own burrows (Thomsen 1971, Barclay et al. 2007), this opportunistic species usually modifies or enlarges existing burrows that were previously used by mammals. In California, the burrowing owl frequently uses burrows of California ground squirrel (*Spermophilus beecheyi*) and round-tailed ground squirrel (*Citellus tereticaudus*), but it may also use dens or holes dug by American badger (*Taxidea taxus*), coyote (*Canis latrans*), and fox (*Vulpes* spp.; Ronan 2002, CDFW 2012). In addition to earthen burrows, the burrowing owl may also use natural rock cavities, debris piles, culverts, openings beneath cement or asphalt pavement, and pipes (Rosenberg et al. 1998) as well as artificial burrows (Smith and Belthoff 2003) for nesting, roosting, and cover (CDFW 2012).

2.3 Burrowing Owl Breeding Information

Burrowing owl breeding behaviors include a wide range of activities associated with site selection by males; breeding pair formation; copulation; egg laying, incubation, and hatching; and care of the young during fledging and post-fledging. In California, the burrowing owl breeding season typically occurs between February 1 and August 31; however, breeding outside this window has been documented under appropriate environmental conditions (CDFW 2012). The peak of the breeding season, when most burrowing owls have active nests, typically occurs between April 15 and July 15. In addition to its nest burrow, the burrowing owl may use satellite burrows to reduce predation and parasite infestation, particularly while caring for nestlings (CDFW 2012).

2.4 Burrowing Owl Population Threats

In California, the burrowing owl is threatened by a variety of factors, including habitat loss, control of burrowing rodents, and direct mortality. Population declines have been attributed to habitat loss, degradation, and fragmentation resulting most often from conversion of suitable habitat as a result of urbanization (Gervais et al. 2008). Burrowing rodent control programs, especially those targeting the California ground squirrel, threaten burrowing owl populations, because ground squirrel burrows are the burrows most often utilized by burrowing owl for nesting and cover. Thus, elimination of burrowing rodents has led to both recent and historical declines of burrowing owl populations in California and nationwide (Klute et al. 2003). Direct mortality from vehicle collisions (Haug et al. 1993, Gervais et al. 2008), agricultural drain/ditch maintenance, discing in fallow fields (Rosenberg and Haley 2004, Catlin and Rosenberg 2006), and wind turbine collisions as well as exposure to pesticides (Klute et al. 2003, Gervais et al. 2008) have all added to the decline of the burrowing owl in California. In areas of remaining open habitat close to or surrounded by developed areas, disturbance from human activity (e.g., walking, jogging, off-road activity, dog walking) and loose and feral pets are likely factors deterring the burrowing owl from these areas (Wesemann and Rowe 1985, Millsap and Bear 2000).

3.0 METHODS

The methods used for the burrowing owl habitat assessment follow guidelines set for by the California Department of Fish and Wildlife (2012) and are presented in this section.

3.1 Habitat Assessment Methods

Qualified BBS biologists conducted a focused habitat assessment during spring 2016 to identify locations of suitable habitat for the species within the Burrowing Owl Habitat Assessment Area. The habitat assessment consisted of an analysis of historical occurrence data, desktop evaluation of available site data and aerial imagery, and a field evaluation to further investigate and map suitable burrowing owl habitat. The following sections provide detail on the habitat assessment methods.

3.1.1 Historical Occurrence Data and Desktop Evaluation

BBS obtained historical burrowing owl occurrence data for the Burrowing Owl Habitat Assessment Area and an approximate 3-mile buffer from the CDFW *California Natural Diversity Database* (CNDDB; CDFW 2014a). BBS also reviewed other special-status species resources, including the CDFW Special Animals list (CDFW 2014b); Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007); San Diego County Breeding Bird Atlas (Unitt 2004); North American Breeding Bird Survey, Results Analysis 1966-2012 (Sauer et al. 2014); eBIRD (http://ebird.org); Gervais et al. (2008); the San Diego Natural History Museum Bird Atlas Project (SDNHM 2014); and other regional and site-specific relevant information, data, and literature.

In addition, BBS evaluated aerial imagery of the Burrowing Owl Habitat Assessment Area to determine if patches of open or other potentially suitable burrowing owl breeding and/or foraging habitat occur or if patches of fully developed, dense vegetation, or other potentially unsuitable burrowing owl habitat occur onsite. Potentially suitable and unsuitable habitat was later evaluated during the focused field evaluation, described below.

3.1.2 Focused Field Evaluation

BBS used the results of the background research and desktop evaluation as guidance during the field evaluation conducted within the Burrowing Owl Habitat Assessment Area. All potentially suitable and unsuitable habitat areas were visited to determine if they did or did not have potential to support breeding and/or foraging burrowing owl. Representative photographs were taken of the Burrowing Owl Habitat Assessment Area.

BBS used the following criteria categories to evaluate the suitability of the Burrowing Owl Habitat Assessment Area:

- dominant vegetation and land use
- presence of adjacent foraging habitat
- vegetation height and shrub density
- presence or absence of friable soils
- presence and quantity of burrows and burrow complexes
- other evidence of fossorial animal use and burrow features
- topography and hydrological features

BBS used this data to assess the overall potential for the Burrowing Owl Habitat Assessment Area to support burrowing owl, taking into consideration the historical occurrence data and the evaluation criteria. Habitat within the Burrowing Owl Habitat Assessment Area was either determined as not expected to support burrowing owl, or as having a low, moderate, or high potential to support burrowing owl.

4.0 RESULTS & DISCUSSION

The results of the habitat assessment for burrowing owl within the Burrowing Owl Habitat Assessment Area are presented in this section, as well as a brief discussion of our findings.

4.1 Habitat Assessment Results

This section provides a summary of the results of the historical occurrence data analysis as well as the results of the focused field evaluation.

4.1.1 Historical Burrowing Owl Occurrence within Vicinity of the Proposed Project

A search of the CNDDB (CDFW 2014a) showed that a single burrowing owl occurrence in the fall of 1993 was recorded within a 3-mile buffer of the Burrowing Owl Habitat Assessment Area. Specifically, the detection was made in an undeveloped area approximately 4,000-feet east of the Proposed Project area near the eastern extent of the Montgomery Field Airport runway. Because of the seasonal timing of this single occurrence, the CNDDB record may represent a migrant or wintering bird, though information on this record is inconclusive. Migrant wintering burrowing owls can utilize a variety of habitats not suitable for breeding individuals. In addition, RECON previously detected a single owl with an active burrow during breeding season surveys approximately 4,000 feet southwest of the Construction Site and approximately 2,500 feet west of the Demolition Site in the southwestern corner of Montgomery Field Airport (RECON 2008).

According to current literature, breeding burrowing owls are believed to be absent from the Burrowing Owl Habitat Assessment Area (Unitt 2004; Lincer and Bloom 2007). Currently, the closest known breeding occurrences are at Naval Air Station North Island, south San Diego coastal areas, and Otay Mesa (Unitt 2004; Lincer and Bloom 2007).

4.1.2 Desktop and Field Evaluation Results

During the initial desktop evaluation of the Burrowing Owl Habitat Assessment Area, BBS concluded that the area within and surrounding the Proposed Project area has potential burrowing owl habitat based on our understanding of the existing conditions onsite along with an interpretation of aerial imagery. Montgomery Field Airport is approximately 456 acres, composed of three asphalt runways, three helipads, hangars, various buildings, and undeveloped native habitat and disturbed land. Areas surrounding the Proposed Project area are fully developed, with light industrial building complexes north and east of Montgomery Field Airport, urban housing in the form of apartment complexes south of Montgomery Field Airport, and Highway 163 and commercial buildings to the west of Montgomery Field Airport. The closest large expanse of native habitat outside Montgomery Field Airport occurs approximately 1.25 miles to the north at U.S. Marine Corps Air Station Miramar.

On May 13, 2016, BBS biologists Darin Busby and Erik LaCoste conducted a field evaluation of the Burrowing Owl Habitat Assessment Area. No burrowing owls or burrowing owl sign were observed during the burrowing owl habitat assessment. Based on the field assessment, BBS evaluated approximately 59 acres of potential burrowing owl habitat (Attachment 1: Figure 3). In general, the Burrowing Owl Habitat Assessment Areas consist of relatively flat topography; however, the Construction Site Assessment Area contains small, undulating mima mounds associated with vernal pools and a north-south running vernal swale in the northern, eastern, and southern extent of the 500-foot buffer. Redding gravelly loam, 2 to 9 percent slopes (RdC), occurs within the Burrowing Owl Habitat Assessment Area, which ranges in structure from compact, graded soils to somewhat friable and well drained soils (USDA 2016). Vegetation communities within the Burrowing Owl Habitat Assessment Area include disturbed habitat, non-native grasslands, San Diego Mesa vernal pool, herbaceous wetland, and Diegan coastal sage scrub. Small mammal burrows were found intermittently throughout the disturbed habitat, non-native grasslands, and Diegan coastal sage scrub. Representative photographs of the Burrowing Owl Habitat Assessment Area are included in Attachment 2: Burrowing Owl Habitat Assessment Photographs. Brief descriptions of each vegetation community within the Burrowing Owl Habitat Assessment Area are provided below.

Disturbed land occurs adjacent to the developed portions of the Construction Site Assessment Area and dominates the Demolition Site Assessment Area. The disturbed habitat consists of flat or nearly flat, open areas ranging from bare ground that has been graded or covered with gravel to a mix of sparse non-native, low-growing vegetation less than a foot in height. Where vegetated, dominant plants include tocalote (*Centaurea melitensis*), long-beak filaree (*Erodium botrys*), Russian thistle (*Salsola tragus*), fountaingrass (*Pennisetum setaceum*), deerweed, African daisy (*Dimorphotheca sinuate*), and Australian tumbleweed (*Salsola australis*). The vegetated areas appear to receive regular maintenance such as weeding or mowing.

Non-native grassland occurs throughout the Construction Site Assessment Area. The non-native grassland is similar to the disturbed areas, consisting of relatively flat terrain and low growing vegetation less than a foot in height; however, this community is dominated by non-native grasses and is more densely vegetated than the disturbed habitat. Dominant plants include long-beak filaree, foxtail chess (*Bromus madritensis*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Festuca perennis*), fountaingrass, tocalote, African daisy, and deerweed (*Acmispon glaber*). Portions of the non-native grassland adjacent to buildings and the runways also appear to receive regular maintenance such as weeding or mowing.

San Diego Mesa vernal pools occur within the northern, eastern, and southern extent of the Construction Site Assessment Area. The San Diego Mesa vernal pools are dominated by low-growing, open vegetation less than a foot in height. Dominant plants include San Diego mesa mint (*Pogogyne abramsii*), Orcutt's brodiaea (*Brodiaea orcuttii*), woolly marbles (*Psilocarphus* sp.), deerweed, clustered tarweed (*Deinandra fasciculata*), and long-beak filaree. These areas do not appear to receive any type of regular vegetation maintenance.

Herbaceous wetland occurs east of the existing paved access road that extends southwest from Ponderosa Avenue, adjacent to the vernal pool/swale complex, within the Construction Site Assessment Area. This community appears to be supported by storm drain run-off and is dominated by low-growing vegetation less than a foot in height. Dominant plants include flatsedge (*Cyperus* sp.), Italian rye grass, curly dock (*Rumex crispus*), and common sow-thistle (*Sonchus oleraceus*). This area does not appear to receive any type of regular vegetation maintenance.

Diegan coastal sage scrub occurs within the northern, eastern, and southern extent of the Construction Site Assessment Area. The Diegan coastal sage scrub consists of native shrubs typical of this vegetation community, such as California sagebrush (*Artemisia californica*), coyote bush (*Baccharis pilularis*), coast California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), laurel sumac (*Malosma laurina*), clustered tarweed, and deerweed. In general, shrubs in the Diegan coastal sage scrub range in height between 2 and 8 feet with an open structure. However, a more heavily vegetated, north-south running vernal swale runs through the Diegan coastal sage scrub just east of the Proposed Project Area. Several vernal pools with low-growing, open vegetation are intermixed within the open Diegan coastal sage scrub. The Diegan coastal sage scrub does not appear to receive any type of regular maintenance.

In summary, with the exception of developed areas and the more densely vegetated, north-south running vernal swale in the Diegan coastal sage scrub just east of the Construction Site, the remaining portions of the Burrowing Owl Habitat Assessment Area contain potentially suitable habitat for breeding and resident burrowing owl as well as migrant wintering burrowing owl (Attachment 1: Figure 3). These areas with potentially suitable habitat contained at least four, of the following characteristics:

- flat or nearly flat topographical features
- vegetation communities and/or vegetation density suitable for burrowing owl
- friable soils with small mammal burrows
- adjacent open foraging or breeding habitat

4.2 SUMMARY & DISCUSSION

No burrowing owls were detected during the burrowing owl habitat assessment. However, an approximate total of 38.6 acres of potentially suitable habitat for breeding, migrant, or wintering owls occurs throughout the Burrowing Owl Habitat Assessment Area, including 28.5 acres of potentially suitable habitat within the Construction Site Assessment Area and 10.1 acres of potentially suitable habitat within the Demolition Site Assessment Area. These areas are considered potentially suitable habitat for burrowing owl, because they contain flat or nearly flat topographical features, vegetation communities and/or vegetation density suitable for burrowing owl, friable soils with small mammal burrows, and/or adjacent open foraging or breeding habitat. In addition, historical records indicate burrowing owl have been detected within Montgomery Field Airport (RECON 2008; CDFW 2014a). Therefore, burrowing owl have a low to moderate potential to occur within the Burrowing Owl Habitat Assessment Area, and focused, breeding season and/or non-breeding season burrowing owl surveys, as outlined in *Appendix D. Breeding and Non-breeding Season Surveys and Reports* from the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012), are recommended to further evaluate the Project Site for the potential to support burrowing owl. These surveys must consist of the following:

- Breeding season surveys – four surveys, including 1) at least one survey between February 15 and April 15, and 2) a minimum of three surveys, at least three weeks apart, between April 15 and July 15, with at least one visit after June 15. If burrowing owl are not detected, non-breeding season surveys must occur.
- Non-breeding season surveys – four surveys, spread evenly, throughout the non-breeding season.

Please do not hesitate to contact me at erik@busbybiological.com or 760.500.8802, or Darin Busby at darin@busbybiological.com or 858.334.9508, if you have any questions.

Sincerely,

Erik LaCoste
Senior Biologist

ATTACHMENTS

Attachment 1: Figures
Attachment 2: Photographs

REFERENCES

Barclay, J.H., K.W. Hunting, J.L. Lincer, J. Linthicum, and T.A. Roberts, editors
2007 Proceedings of the California Burrowing Owl Symposium, 11-12 November 2003, Sacramento, California, USA. Bird Populations Monographs No. 1. The Institute for Bird Populations and Albion Environmental, Inc., Point Reyes Station, CA.

Bent, A.C.
1961 Life histories of North American birds of prey. Part 2. U.S. Natl. Mus. Bull. No. 170. Dover Publications, New York.

California Department of Fish and Wildlife (CDFW)
2012 Staff Report on Burrowing Owl Mitigation. State of California. Natural Resources Agency, Department of Fish and Game. March 2012.
2014a Natural Diversity Data Base. Nongame-Heritage Program, California Department of Fish and Wildlife, Sacramento.
2014b CDFW Biogeographic Data Branch, California Natural Diversity Database. Special Animals List. Available at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf. January 2011. Accessed October 2014.

Catlin, D.H. and D.K. Rosenberg
2006 Nest destruction increases mortality and dispersal of Burrowing Owls in the Imperial Valley, California. Southwest Naturalist 51: 406–409.

Desante, D.F., E.D. Ruhlen, S.L. Adamany, K.M. Burton, and S. Amin
1997 A census of Burrowing Owls in Central California in 1991. Pages 38-48 in Lincer, J. L. and K. Steenhof [EDS]. 1997. The Burrowing Owl, Its Biology and Management: Including the Proceedings of the First International Burrowing Owl Symposium. Raptor Research Report Number 9.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye
1988 The Birder's Hanbook; A Field Guide to the Natural History of North American Birds. Simon and Schuster Inc. New York.

Gervais, J.A., D.K. Rosenberg, and L.A. Comrack
2008 Burrowing Owl (Athene cunicularia) *in* California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, California, USA.

Haug, E.A., B.A. Millsap, and M.S. Martell
1993 Burrowing owl (Speotyto cunicularia), *in* A. Poole and F. Gill, editors, The Birds of North America, The Academy of Natural Sciences, Philadelphia, Pennsylvania, and The American Ornithologists' Union, Washington, D.C., USA.

Haug, E.A. and L.W. Oliphant
1990 Movements, activity patterns, and habitat use of burrowing owls in Saskatchewan. Journal of Wildlife Management 54: 27-35.

Klute, D.S., L.W. Ayers, M.T. Green, W.H. Howe, S.L. Jones, J.A. Shaffer, S.R. Sheffield, and T.S. Zimmerman
2003 Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Lincer, J.L. and P.H. Bloom
2007 The Status of the Burrowing Owl in San Diego County, California. Proceedings of the California Burrowing Owl Symposium 90-102 © The Institute for Bird Populations

Millsap, B.A. and C. Bear
2000 Density and reproduction of Burrowing Owls along an urban development gradient. Journal of Wildlife Management 64:33-41.

RECON Environmental, Inc. (RECON)
2008 Final Environmental Constraints Report for West and Northwest Areas of Montgomery Field Airport, San Diego, California. May 19.

Ronan, N.A.
2002 Habitat selection, reproductive success, and site fidelity of burrowing owls in a grassland ecosystem. Thesis, Oregon State University, Corvallis, Oregon, US

Rosenberg, D.K., J.A. Gervais, H. Ober, and D.F. DeSante
1998 An adaptive management plan for the burrowing owl population at Naval Air Station Lemoore, California, USA. Publication 95, Institute for Bird Populations, P.O. Box 1346, Pt. Reyes Station, CA 94956.

Rosenberg, D.K., and K.L. Haley
2004 The ecology of burrowing owls in the agroecosystem of the Imperial Valley, California. Studies in Avian Biology 27:120-135.

Sauer, J.R., J.E. Hines, J.E. Fallon, K.L. Pardieck, D.J. Ziolkowski, Jr., and W.A. Link
2014 *The North American Breeding Bird Survey, Results and Analysis 1966 - 2012.* Version 02.19.2014 USGS Patuxent Wildlife Research Center, Laurel, MD.

San Diego Natural History Museum (SDNHM)
2014 http://www.sdnhm.org/science/birds-and-mammals/projects/san-diego-county-bird-atlas/. Bird Atlas Project. Accessed October 2014.

Shuford, W.D. and T. Gardali

2008 California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Smith, B.W. and J.R. Belthoff
2003 Patterns of artificial burrow occupancy and reuse by burrowing owls in Idaho. Wildlife Society Bulletin 31:1-7.

Thomsen, L.
1971 Behavior and ecology of burrowing owls on the Oakland Municipal Airport Condor 73: 177-192.

U.S. Geological Survey (USGS)
1996 7.5-minute La Jolla Topographic Quadrangle

Unitt, Philip
2004 San Diego County Bird Atlas. San Diego Natural History Museum. San Diego, CA.

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
2016 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions [Online WWW]. Available at: http://soils.usda.gov/technical/classification/osd/index.html. Accessed June 2016.

Wesemann, T. and M. Rowe.
1985 Factors influencing the distribution and abundance of Burrowing Owls in Cape Coral, Florida. Pages 129-137 in Adams and Leedy, EDS. Integrating Man and Nature in the Metropolitan Environment. Proc. Natl. Symp. on Urban Wildlife.

ATTACHMENT 1 – Figures

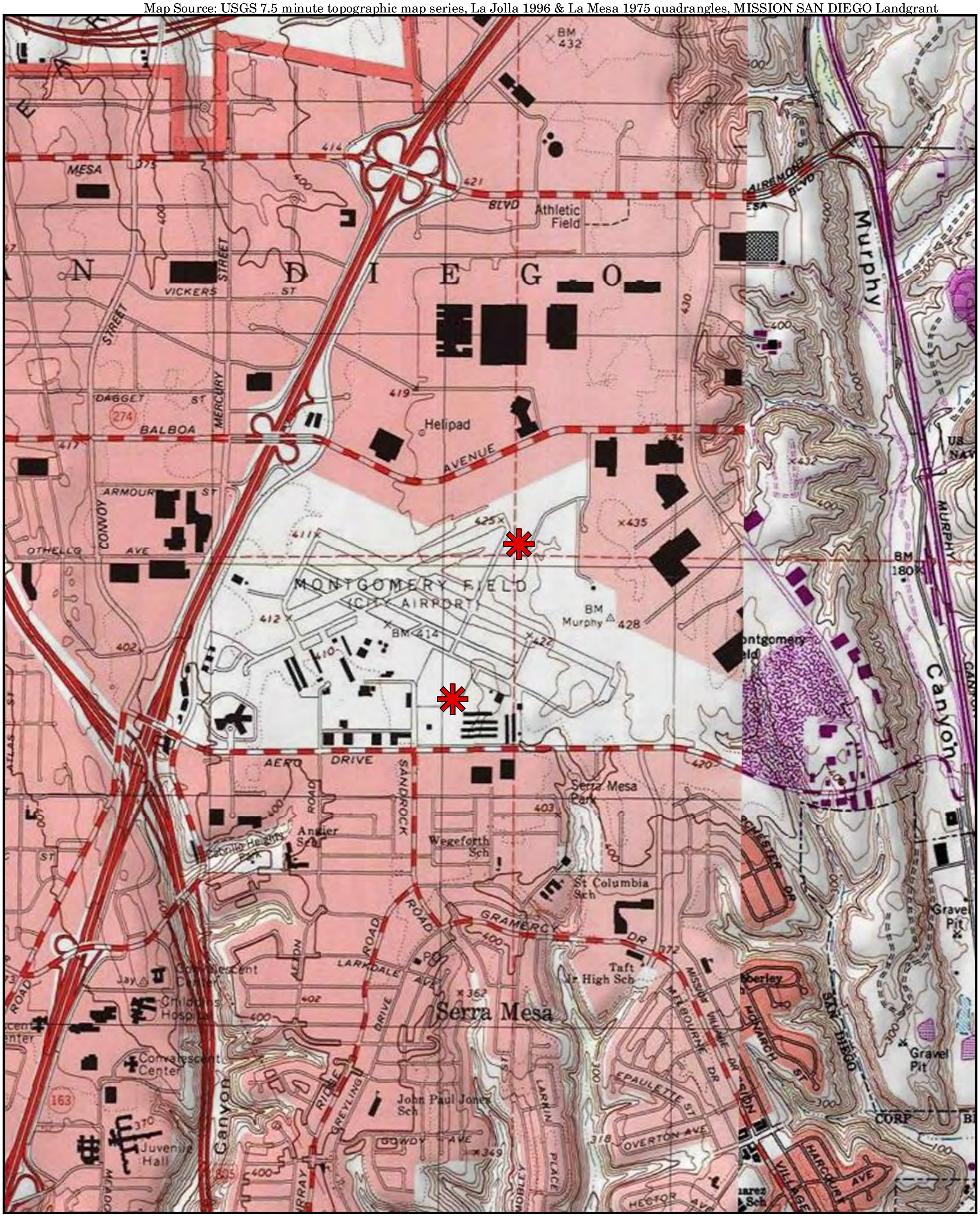
Project Location

FIGURE 1
Regional Location

RECON

M:\JOBS5\8239\common_gis\fig1_NCS.mxd 6/6/2016 sab

Map Source: USGS 7.5 minute topographic map series, La Jolla 1996 & La Mesa 1975 quadrangles, MISSION SAN DIEGO Landgrant



0 Feet 2,000

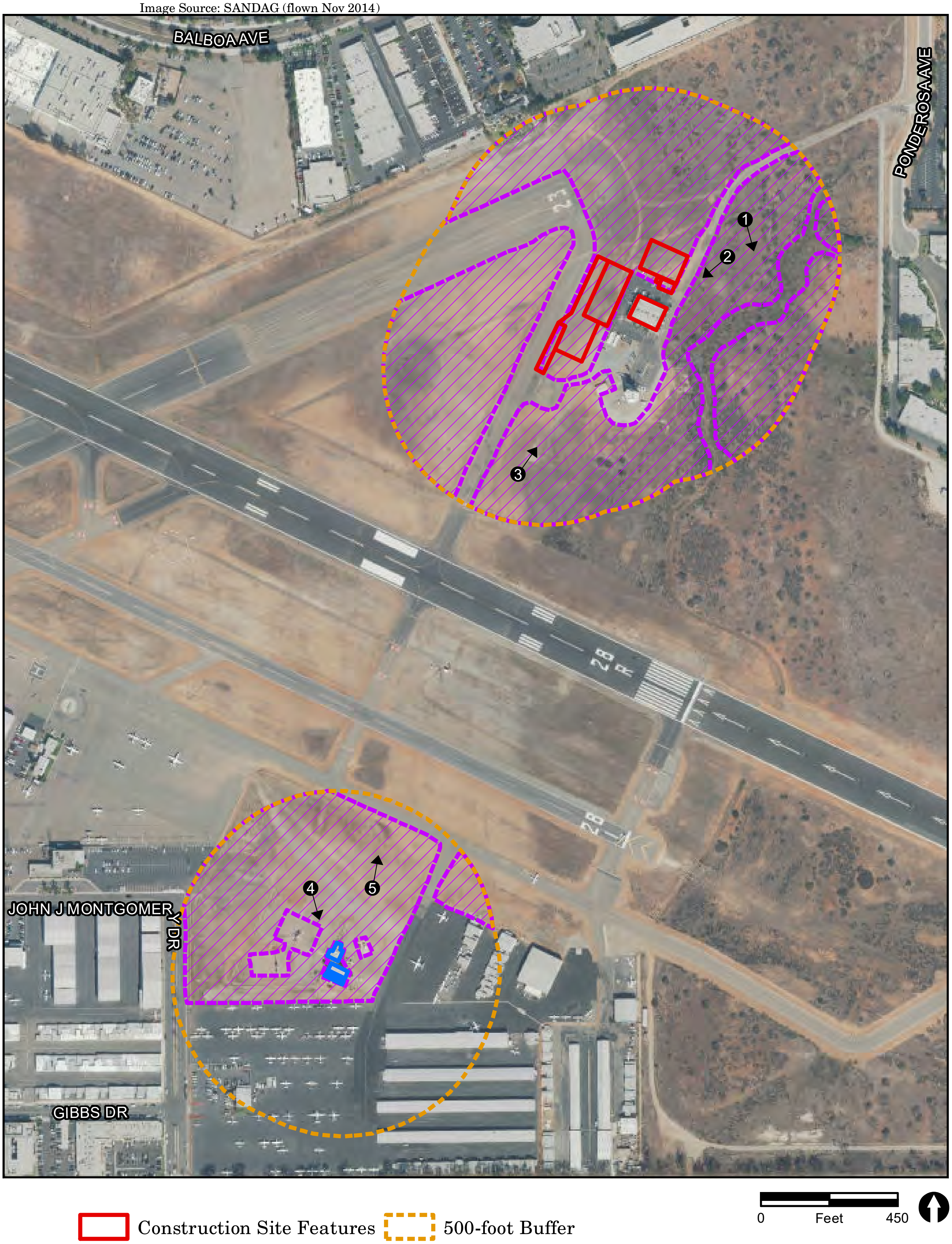
Project Locations

FIGURE 2
Project Vicinity on USGS Map

RECON

M:\JOBS5\8239\common_gis\fig2_NCS.mxd 6/7/2016 sab

Image Source: SANDAG (flown Nov 2014)



Construction Site Features
Demolition Site Features
500-foot Buffer
Burrowing Owl Suitable Habitat
Photo Point

FIGURE 3

Burrowing Owl Habitat Assessment

RECON

M:\JOBS5\8239\common_gis\fig3_buow.mxd 6/17/2016 sab

ATTACHMENT 2 – Photographs

Photograph 1. Open Diegan coastal sage scrub. Burrowing owl have a low potential for occurrence due to density of shrubs. However, there is presence of small mammal burrows, relatively flat topography, and adjacent low-density vegetation (Facing southeast; May 13, 2016).

Photograph 2. Non-native grasslands and open Diegan coastal sage scrub with exisiting building proposed for remodel in background at Construction Site Assessment Area. Burrowing owl have a low to moderate potential for occurrence due to presence of low-density vegetation, flat topography, adjacent suitable habitat, friable soils, and scattered small mammal burrows (Facing west; May 13, 2016).

Photograph 3. Non-native grassland and disturbed habitat with exisiting building proposed for remodel in background at Construction Site Assessment Area. Burrowing owl have a low to moderate potential for occurrence due to presence of low-density vegetation, flat topography, adjacent suitable habitat, friable soils, and scattered small mammal burrows (Facing north; May 13, 2016).

	**Photograph 4.** Developed land and disturbed habitat with proposed building to be demolised in background within Demolition Site Assessment Area. Burrowing owl have a low potential for occurrence in outlying disturbed habitat due to presence of low-density vegetation, flat topography, and adjacent suitable habitat (Facing southeast; May 13, 2016).
	**Photograph 5.** Disturbed habitat in outlying areas surrounding Demolition Site Assessment Area. Burrowing owl have a low potential for occurrence in these outlying areas due to presence of low-density vegetation, flat topography, adjacent suitable habitat, and scattered small mammal burrows (Facing north; May 13, 2016).

APPENDIX H

VERNAL POOL MITIGAITON PLAN

Vernal Pool Mitigation Plan for the La Media Road Widening & Fire-Rescue Air Operations Phase II Project San Diego, California

Prepared for
City of San Diego
Public Works Department
525 B Street, Suite 750 MS 980A
San Diego, CA 92101

Prepared by
RECON Environmental, Inc.
1927 Fifth Avenue
San Diego, CA 92101
P 619.308.9333

RECON Number 9227
May 28, 2020

Meagan Olson, Restoration Ecologist

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

FIGURES

TABLES

TABLE OF CONTENTS (cont.)

TABLES (cont.)

Acronyms

Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
City	City of San Diego
CRAM	California Rapid Assessment Method
DSD	Development Services Department
DSM	digital surface model
FAA	Federal Aviation Administration
MMC	Mitigation Monitoring and Coordination
MSCP	Multiple Species Conservation Program
MSS	maritime succulent scrub
PEP	Plant Establishment Period
PWD	Public Works Department
sUAV	small unmanned aerial vehicle
USFWS	U.S. Fish and Wildlife Service
VPHCP	City of San Diego Vernal Pool Habitat Conservation Plan

1.0 Introduction

This mitigation plan is intended to mitigate for impacts to vernal pool habitat for the La Media Road Widening Project and the Fire-Rescue Air Operations Phase II Project. Impacts from these projects are still being assessed and will be discussed in more detail in each project-specific biological technical report. Any additional mitigation credits not needed for these projects would be available for future City of San Diego (City) projects.

1.1 Project Location

The La Media Road Widening Project is located in the Otay Mesa neighborhood of the City, along La Media Road, south of Interstate 905. The Fire-Rescue Air Operations Phase II Project is located at Montgomery-Gibbs Executive Airport in the City in the Kearny Mesa Planning Area. The vernal pool mitigation site (mitigation site) is located in the City's Otay Mesa neighborhood, south of the southern terminus of Caliente Avenue, and approximately three miles west of the La Media Road Widening Project. The mitigation site was selected to support mitigation for both projects in an effort to create a larger preserve as opposed to two smaller mitigation sites. On-site mitigation for the Fire-Rescue Air Operations Phase II Project was not feasible due to Federal Aviation Administration (FAA) restrictions that limit restoration near airports. Additionally, the Fire-Rescue Air Operations Phase II Project and the mitigation site are both located within spreading navarretia (*Navarretia fossalis*) critical habitat and, although no spreading navarretia was impacted, the mitigation plan will aim to restore viable populations of this species.

It is situated along a City-owned dirt road south of Dillon Canyon (Figures 1 through 3). The mitigation site is made up of eight City-owned one-acre parcels with an approximately 40-foot road easement that passes north to south through the center, bisecting the site into two four-acre areas. The City-owned parcels are dedicated Open Space as part of the City of San Diego Vernal Pool Habitat Conservation Plan (VPHCP) and managed by the City Park and Recreation Department. The City will be pursuing an easement vacation to dissolve the road easement and incorporate that area into the site. Figures 2 and 3 show the individual one-acre parcels with the road easement in the center while all subsequent figures display the mitigation site boundary as a whole, after road easement vacation.

1.2 Restoration Goals and Objectives

The goal of this plan is restoration of vernal pools as mitigation for 0.125 acre of impacts caused by the La Media Road Widening (three vernal pool basins) and 0.087 acre of impacts caused by the Fire-Rescue Air Operations Phase II project (six vernal pool basins). These impacts are being mitigated through the restoration of 0.814 acre (35,443 square feet) of vernal pool surface area, enhancement of 0.150 acre (6,524 square feet) of existing vernal pools, and restoration of 6.666 acres of adjacent upland watershed.

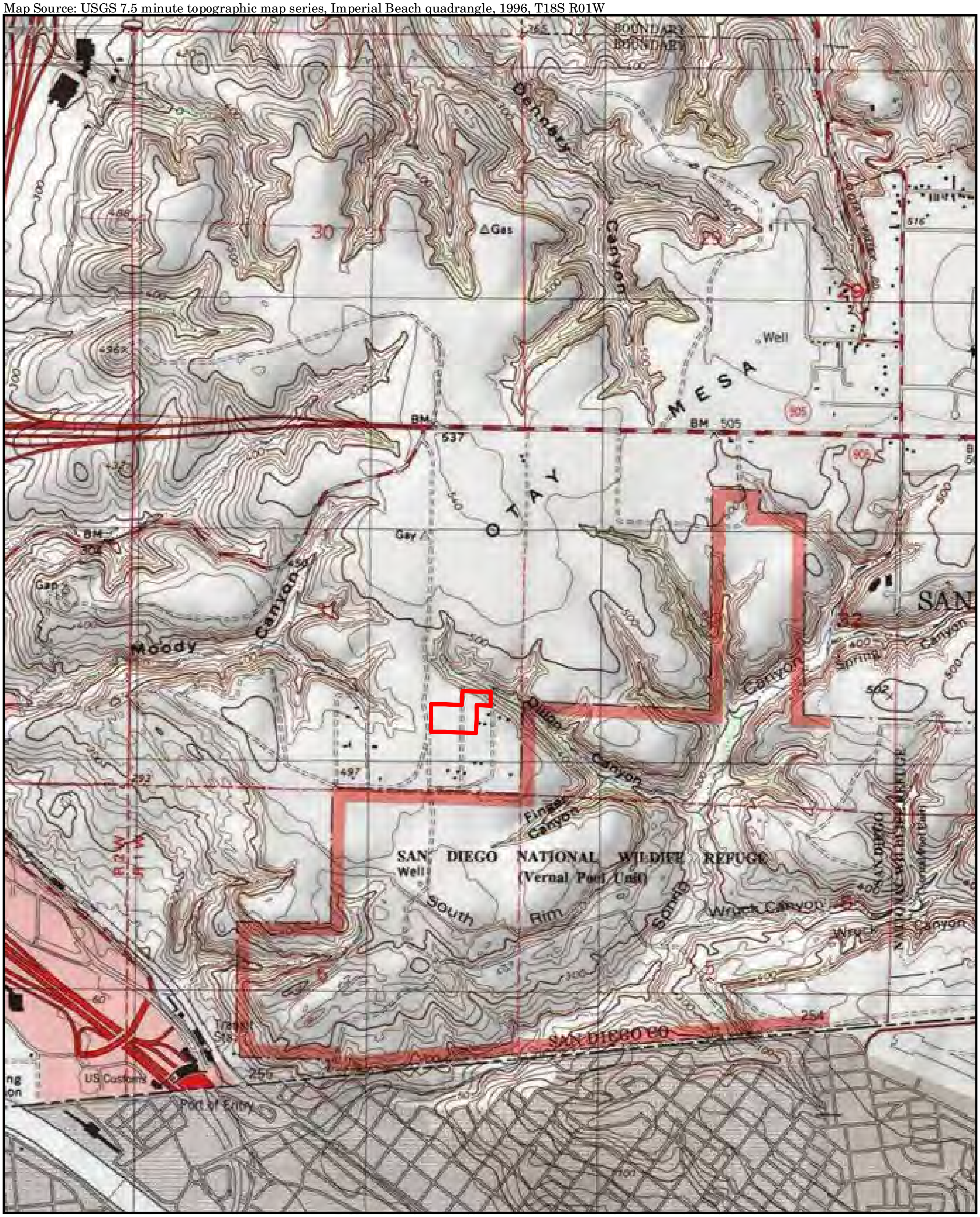
Project Location

FIGURE 1
Regional Location

RECON

M:\JOBS5\9227\common_gis\fig1_vp.mxd 4/10/2019 bma

Map Source: USGS 7.5 minute topographic map series, Imperial Beach quadrangle, 1996, T18S R01W



0 Feet 2,000

Project Boundary

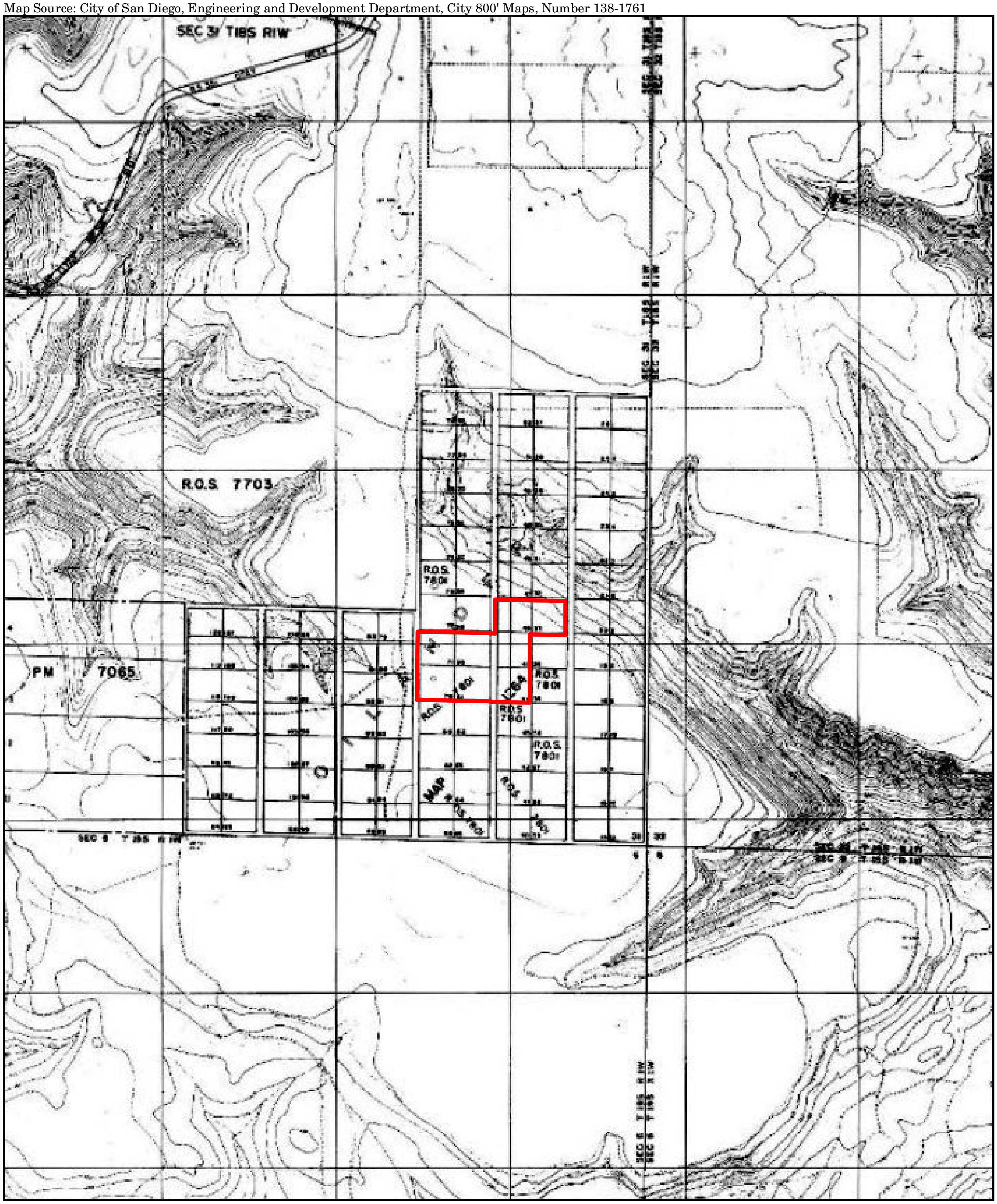
FIGURE 2

Mitigation Site Location on USGS Map

RECON

M:\JOBS5\9227\common_gis\fig2_vpmit.mxd 8/1/2019 bma

Map Source: City of San Diego, Engineering and Development Department, City 800' Maps, Number 138-1761



0 Feet 800

Project Boundary

FIGURE 3

Mitigation Site Location on City 800' Map

RECON

M:\JOBS5\9227\common_gis\fig3_vpmit.mxd 8/1/2019 bma

2.0 Mitigation Site Existing Conditions

2.1 Mitigation Site Description

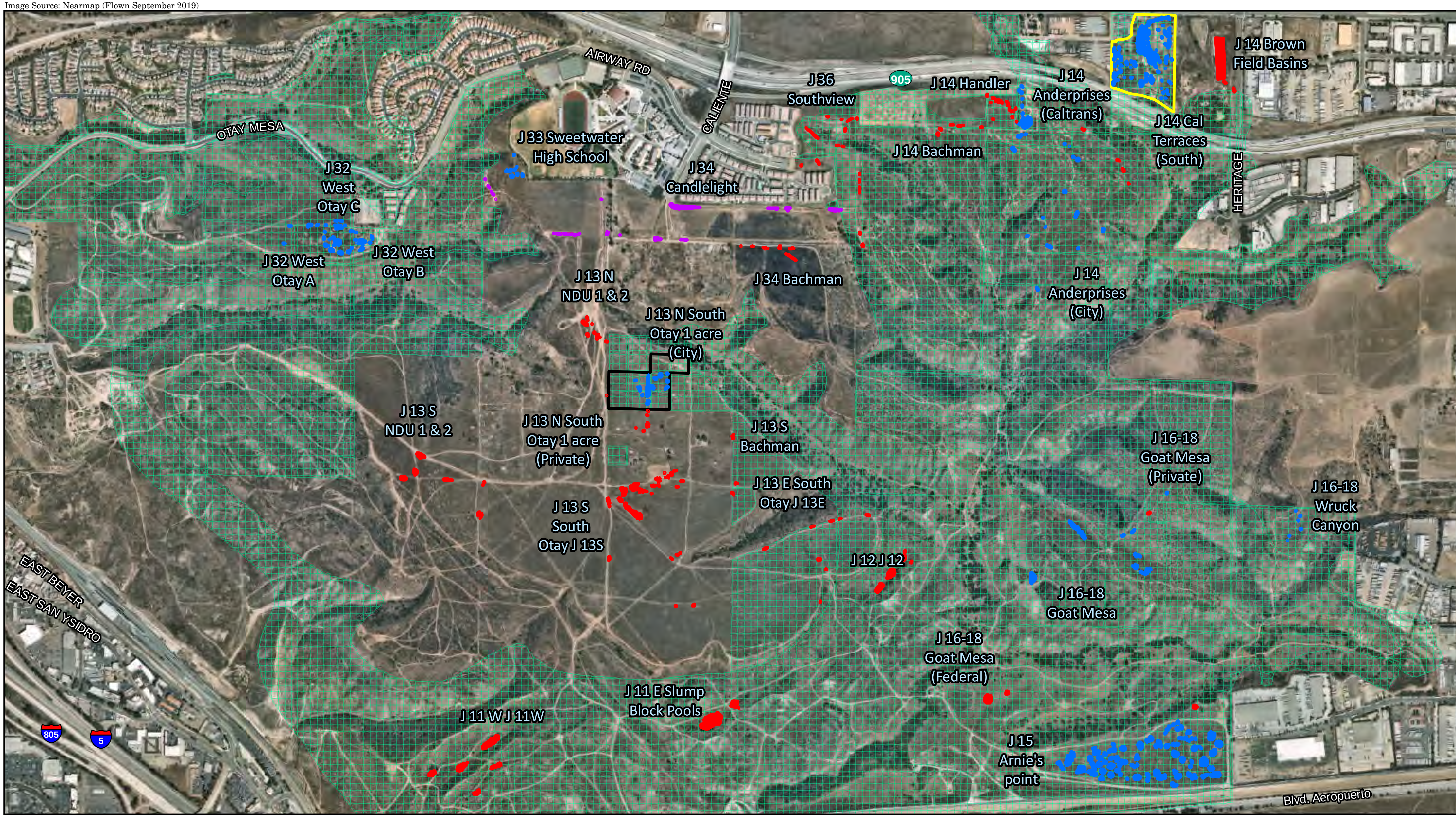
The VPHCP (City of San Diego 2017a) and Vernal Pool Management and Monitoring Plan (VPMMP; City of San Diego 2017b) identify the mitigation site as part of vernal pool complex J 13 N (Figure 4). The J 13 N complex was identified in the Recovery Plan for Vernal Pools of Southern California (U.S. Fish and Wildlife Service [USFWS] 1998) as necessary to stabilize populations of San Diego button-celery (*Eryngium aristulatum*), Otay Mesa mint (*Pogogyne nudiuscula*), spreading navarretia (*Navarretia fossalis*), Orcutt's grass (*Orcuttia californica*), San Diego fairy shrimp (*Branchinecta sandiegoensis*), and Riverside fairy shrimp (*Streptocephalus woottoni*).

Complex J 13 N comprises three sites: South Otay 1 acre (City), South Otay 1 acre (Private), and NDU 1 & 2 (see Figure 4). The VPHCP identifies 37 pools existing in the complex, of which 17 pools are located on the South Otay 1 acre (City) site, which is fully conserved and is owned and managed by the City Park and Recreation Department. The remaining 20 vernal pools are on the South Otay 1 acre (Private) and NDU 1 & 2 sites, which are on private non-conserved properties zoned for multi- and single-family residential development. It is assumed that these non-conserved properties will be developed in the future.

South Otay 1 acre (City) is an approximately 12-acre site comprising 12 one-acre parcels. The City acquired four one-acre parcels from The Environmental Trust as part the latter's bankruptcy proceedings, and the remaining eight one-acre parcels through a Federal Section Six Grant and City funds with the goal of establishing a vernal pool preserve. These 12 one-acre parcels were added to the MHPA pursuant to the VPHCP.

The mitigation site totals 7.63 acres and consists of undeveloped City land and is currently surrounded by undeveloped open space. The areas immediately north and immediately east of the mitigation site will be preserved as open space, while development areas for the Otay Mesa Southwest Village will occur approximately 400 feet to the north, providing at least a 400-foot buffer between development and the mitigation site. Future developments may occur immediately west of the mitigation site and a road is planned 50 feet to the south. All future development that may occur adjacent to the mitigation site would be required to adhere to Section 5.2.1 of the VPHCP, including being designed in a manner that prevents runoff from entering vernal pools. Due to the location of potential future development, the mitigation site was designed in a manner to provide adequate buffer between potential development and the vernal pools and their watersheds. The MHPA runs within Dillon Canyon to the northwest of the mitigation site (Figure 5). The mitigation site has been subjected to recent and historic disturbance and unauthorized activity (e.g., off-highway vehicle use, pedestrian traffic, and trash dumping).

Image Source: Nearmap (Flown September 2019)



Vernal Pools per VPHCP

- Conserved Pools
- Non-Conserved Pools per VPHCP
- Not Part of VPHCP
- Project Boundary
- Cal Terraces Reference Site
- Multi-habitat Planning Area

0 Feet 800

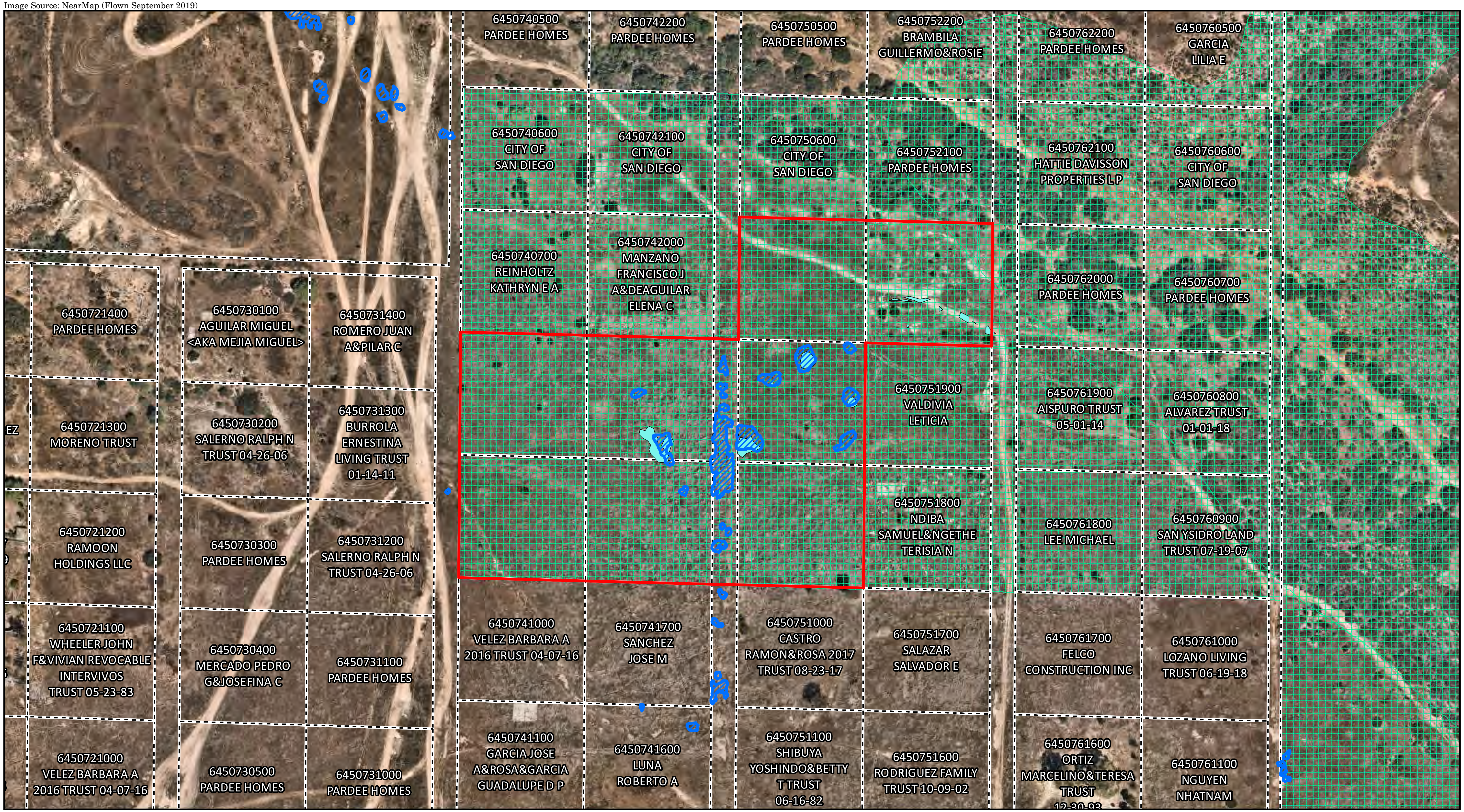
FIGURE 4

Regional Vernal Preservation Context

RECON

M:\JOBS5\9227\common_gis\fig4_vpmit.mxd 11/22/2019 bma

Image Source: NearMap (Flown September 2019)



Project Boundary

Parcel Boundary

Multi-Habitat Planning Area

Vernal Pools per RECON 2019

San Diego HCP Vernal Pools

0 Feet 150

RECON

M:\JOBS5\9227\common_gis\fig5_vpmit.mxd 11/22/2019 bma

FIGURE 5

Mitigation Site Location and Surrounding Land Use

2.2 Soil Characteristics

Two soil series are mapped within the mitigation site: Huerhuero loam and Olivenhain cobbly loam (Figure 6; U.S. Department of Agriculture 1973). Huerhuero loam is the dominant soil, underlying most of the site. This soil series includes moderately well drained soils with clay subsoils. It occurs on gently sloping, undulating sites and often forms mima mounds in less disturbed areas. Olivenhain cobbly loams are present only in the northeast corner of the mitigation site, where the mesa ends and slopes north into a finger canyon. Olivenhain cobbly loams are well-drained, moderately deep soils with cobbly clay subsoils.

Both Huerhuero and Olivenhain soil series are known to support vernal pools, and vernal pools are present on the mitigation site (Bauder and McMillan 1998), so the soils are expected to be suitable for vernal pool restoration.

2.3 Hydrology

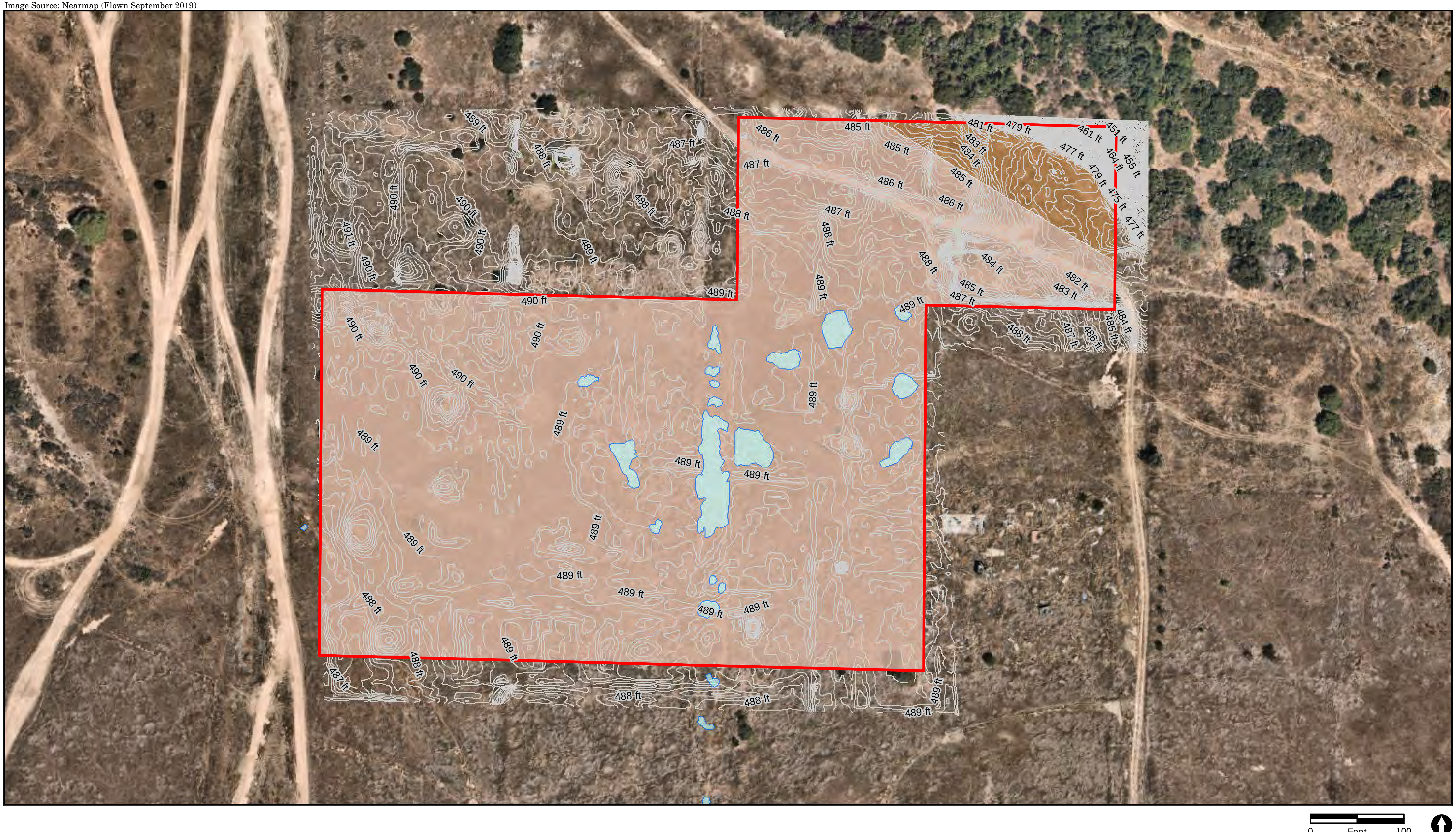
The vernal pool mitigation site is primarily flat and does not contain any drainages or streams; however, there are 17 existing vernal pools as mapped by the City's VPHCP within the site, including nine pools within the 1-acre parcels and eight within the road easement that will be vacated. During the 2019 vegetation mapping conducted by RECON, ten pools with vernal pool vegetation were mapped. Seven of those pools did not overlap with the City's existing VPHCP pools, for a total of 24 existing vernal pools (Figure 7).

In coastal southern California, annual precipitation is highly seasonal, with most of the rainfall occurring in the winter and early spring, from December through April. The first major rainfall event of the season typically functions to wet and recharge soils that dried during the summer drought. Thus, the first rainfall event rarely fills vernal pools, with surface ponding typically occurring from subsequent storms.

The formation of surface ponding in vernal pools requires very low permeability soils that create a perched water table, combined with topographic depressions to capture and hold precipitation. The shape and ponding capacity of the perched water table is influenced by soil permeability, overall site slope, and subsoil permeability (presence of sand, clay lenses, or holes in the hardpan). This surface shape ultimately determines the depth and duration of ponding.

The depth and duration of ponding is highly dependent upon the magnitude, number, and time between each storm, as well as climactic determinants of evaporation and transpiration (temperature, humidity, sunlight, and wind). A seasonal hydrologic regime characterizes the natural inputs to the vernal pools and other isolated waters of the U.S. and waters of the State on the site. The local watersheds of many these pools have been altered by vehicular activity, dumping, and historical agriculture.

Image Source: Nearmap (Flown September 2019)



Project Boundary
Vernal Pools per VPHCP
Topographic Contours

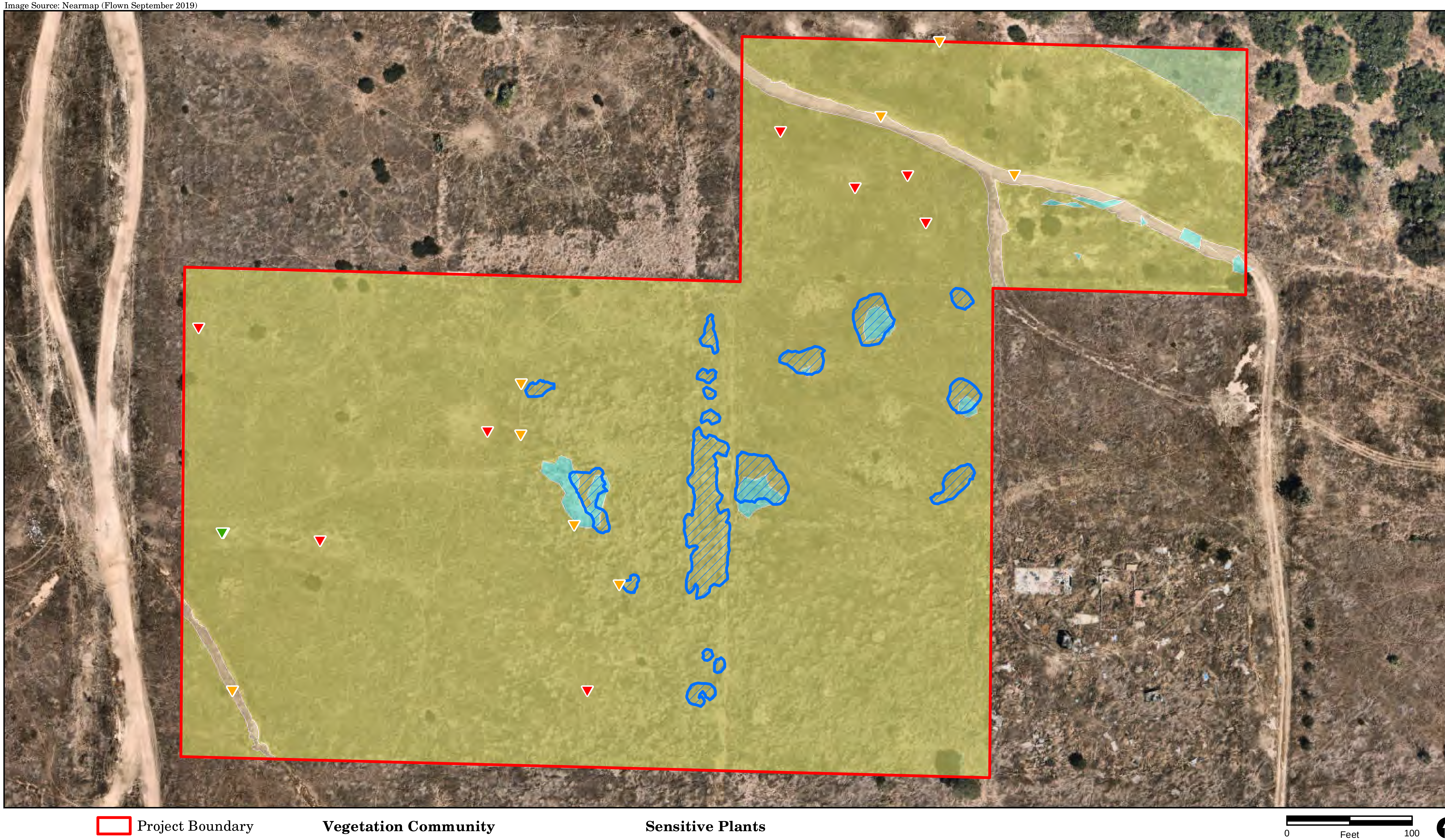
Soil Type
Huerhuero loam, 2 to 9 percent slopes
Olivenhain cobbly loam, 30 to 50 percent slopes

RECON

M:\JOBS5\9227\common_gis\fig6_vpmit.mxd 11/21/2019 bma

FIGURE 6
Mitigation Site Soil Map

Image Source: Nearmap (Flown September 2019)



Project Boundary

Vernal Pools per VPHCP

Vegetation Community

Vernal Pool (0.079 Acre)

Diegan Coastal Sage Scrub (0.082 Acre)

Non-Native Grassland (7.412 Acres)

Disturbed Land (0.139 Acre)

Sensitive Plants

Ashy Spike-Moss (*Selaginella cinerascens*)

Vernal Pool Indicator Plant Species

Dwarf Pepper Grass (*Lepidiom latipes*)

Dwarf Woollyheads (*Psilocarphus brevissimus*)

RECON

M:\JOBS5\9227\common_gis\fig7_vpmit.mxd 11/21/2019 bma

FIGURE 7

Mitigation Site Location and Existing Biological Resources

2.4 Biological Conditions

RECON Environmental, Inc. (RECON) biologists conducted a general biological survey of the mitigation site on March 28, 2019, and a vernal pool survey following the California Rapid Assessment Method (CRAM) on May 3, 2019.

2.4.1 Vegetation Communities

The mitigation site is located on a large mesa characterized by non-native vegetation composed primarily of annual grasslands, with patches of native shrub habitat in the canyons. Dillon Canyon, which crosses the northeast corner of the mitigation site, supports grassland and Diegan coastal sage scrub. The area surrounding the project site generally contains flat topography intersected by finger canyons that lead south to the Tijuana River Valley (see Figure 2). There are four vegetation communities within the mitigation site: non-native grassland (7.412 acres), disturbed land (0.139 acre), vernal pool (0.079 acre), and Diegan coastal sage scrub (0.082 acre; see Figure 7).

Non-native grassland. Non-native grassland covers the majority of the mitigation site. Overall vegetation cover is dense, characterized by non-native annual grasses, such as rye grass (*Festuca perennis*), slender wild oat (*Avena barbata*), ripgut grass (*Bromus diandrus*), and wall barley (*Hordeum murinum*), as well as patches of black mustard (*Brassica nigra*), Russian thistle (*Salsola tragus*), and fennel (*Foeniculum vulgare*). A number of native herbs and annuals are present, including bluedicks (*Dichelostemma capitatum*), collar lupine (*Lupinus truncatus*), and common muilla (*Muilla maritima*). Additionally, there are occasional native shrubs, like California buckwheat (*Eriogonum fasciculatum*), broom baccharis (*Baccharis sarothroides*), and lemonade berry (*Rhus integrifolia*) present.

Disturbed land. Disturbed land, consisting of several dirt roads, occurs within the mitigation site, with one road in the northeast portion and one crossing the southwest corner of the site. These areas are only sparsely vegetated, with long-beak filaree (*Erodium botrys*) providing the majority of the cover, with scattered fascicled tarplant (*Deinandra fasciculata*), garland daisy (*Glebionus coronaria*), native pygmy weed (*Crassula connata*), and non-native grasses.

Vernal pools. The City's Vernal Pool Habitat Conservation Plan (VPHCP; City of San Diego 2017a) identifies 9 vernal pools within the mitigation site, plus an additional 8 vernal pools within the road easement bisecting the eight one-acre parcels (see Figure 7). During the general biological survey, RECON identified 11 vernal pool areas within the mitigation site based on the presence of vernal pool indicator plants, such as dwarf woollyheads (*Psilocarphus brevissimus* var. *brevissimus*), American pillwort (*Pilularia americana*), toad rush (*Juncus bufonius*), and pale spikerush (*Eleocharis macrostachya*). Five of the 11 RECON-identified pools are pools that are also identified in the VPHCP. In total, 23 pools have been observed on-site based on the presence of vernal pool vegetation.

Diegan coastal sage scrub. Diegan coastal sage scrub occurs in the northeast corner of the mitigation site, where the flat mesa slopes into Dillon Canyon. Vegetation in this area is dominated by lemonade berry and black mustard, with lesser components of California sagebrush (*Artemisia californica*) and jojoba (*Simmondsia chinensis*).

2.4.2 Wildlife Species

Wildlife diversity is fairly low within the mitigation site, as may be expected for an area dominated by non-native grassland. The majority of the wildlife species detected are typical of grassland habitats and disturbed areas. A total of 12 birds were observed during the biological survey, including western meadowlark (*Sturnella neglecta*), common raven (*Corvus corax clarionensis*), American crow (*Corvus brachyrhynchos hesperis*), house finch (*Haemorhous mexicanus frontalis*), horned lark (*Eremophila alpestris*), white-crowned sparrow (*Zonotrichia leucophrys*), northern mockingbird (*Mimus polyglottos polyglottos*), red-tailed hawk (*Buteo jamaicensis*), Say's phoebe (*Sayornis saya*), mourning dove (*Zenaida macroura marginella*), cliff swallow (*Petrochelidon pyrrhonota tachina*), and wrentit (*Chamaea fasciata henshawi*). Additionally, three butterfly species were detected: painted lady (*Vanessa cardui*), west coast lady (*Vanessa atalanta rubria*), and Pacific Sara orangetip (*Anthocharis sara sara*). One crustacean species, seed shrimp (*Cladocera* sp.), was observed in the vernal pools, although fairy shrimp surveys were not conducted. Fairy shrimp species were not identified on-site by the VPHCP.

2.5 Cultural Resources

RECON archaeologists conducted a record search with the California Historical Resources Information System in March 2019. A total of 44 cultural resource records were found within the one-half mile search radius, including two records located between approximately 130 and 400 feet northwest of the mitigation site. These records consist of lithic scatters, including milling implement fragments. No cultural resource records, historic structures, or historic addresses are listed within or immediately adjacent to the mitigation site.

RECON conducted a field survey on March 19, 2019. No cultural material was observed during the survey; however, ground visibility was very low as a result of dense vegetation cover.

2.6 Rationale for Expecting Success

2.6.1 Regional Factors

The proposed mitigation site lies on a relatively flat portion of western Otay Mesa. The VPHCP identifies 28 distinct sites with vernal pool complexes in the vicinity. The mitigation site, identified as part of complex J 13 N on Figure 4, is on conserved land in the MHPA. Most of these complexes are located within the MHPA and several are on conserved lands; however, many of the vernal pool complexes closest to the mitigation site (red pools on Figure 4; J 11, J 13, J 13 S, J 34, and J 36) are on private property and may not be conserved. The complexes beyond these non-conserved areas (blue pools on Figure 4; J 32 and J 33 to the west and J 14, J 15, and J 16 to the east) are all conserved. Thus, the mitigation site will connect to the vernal pool preserve area to the north and open space to the east, and be buffered by the open space in Dillon Canyon to the northeast. Even with the Otay Mesa Southwest Village development, the mitigation site will improve the number and quality of vernal pools in Complex J 13 N and maintain a stepping stone connection between the conserved complexes on western Otay Mesa.

Currently, most of the land in the project vicinity is undeveloped; however, the planned Otay Mesa Southwest Village, other developments, and a road are expected to develop portions of the surrounding land to the west and south. The Southwest Village development is expected to preserve the areas north and east of the restoration site as open space. The locations and proximity of the nearby developments were considered when developing this mitigation plan and the vernal pool basins were designed to have adequate watershed-to-basin ratios to support vernal pool flora and fauna, despite adjacent development plans. The watersheds of all vernal pool basins are either within the mitigation site or just outside the mitigation site (i.e., extending no further than 50 feet outside the mitigation site) but within areas not planned for development. Additionally, any development that may occur adjacent to the mitigation site will be required to comply with Section 5.2.1 of the VPHCP and the Land Use Adjacency Guidelines in the MSCP Subarea Plan (City of San Diego 1997). These guidelines apply to projects that are adjacent to the MHPA and include restrictions on drainage of urban runoff, release of toxic materials, lighting, noise, public access, invasive non-native species, brush management, and grading within the MHPA. As the mitigation site is within the MHPA, these guidelines would provide protections for the restored pools from indirect impacts. The design of this mitigation site provides sufficient buffers to adequately protect the proposed vernal pools and their watersheds.

2.6.2 Environmental Factors

The mitigation site contains soils that are highly suitable for vernal pool restoration (Bauder and McMillan 1998), and there are a large number of vernal pool complexes on the site and surrounding area (see Figure 4). It is situated within an area of designated critical habitat for listed fairy shrimp species and also within the City of San Diego's Multiple Species Conservation Plan (MSCP) hardline preserve. Moreover, vernal pool restoration on the site would add to the value of existing adjacent preserved open space areas (see Figure 4).

2.6.3 Design Factors

The proposed restoration includes an 8:1 watershed to basin ratio with additional watershed being provided by the preserved areas adjacent to the site. This ratio combined with the preserved areas adjacent to the site helps ensure that the basins will receive adequate hydrologic input to support vernal pool plant and animal species, assuming average or better rainfall. In addition, the planting and seeding palette for the vernal pool basins includes species with a wide range of hydrological and inundation requirements, and an emphasis on indicator species that are known to germinate and survive in lower rainfall years.

2.7 Consistency Analysis

This Mitigation Plan has been prepared in accordance with the mitigation measures included in the Biological Resources Report for the La Media Road Widening Project (RECON 2020) and the Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II (City of San Diego 2020) and the VPHCP. Table 1 includes a consistency analysis for this Mitigation Plan with the VPHCP Conservation Objectives.

3.0 Roles and Responsibilities

3.1 Project Proponent and Financially Responsible Party

The project proponent (City of San Diego Public Works Department [PWD]) will be responsible for retaining (1) a qualified vernal pool restoration specialist with over seven years of experience monitoring vernal pool habitat restoration to oversee the entire installation and monitoring of the mitigation program in coordination with City Development Services Department (DSD) staff and (2) a qualified installation/maintenance contractor with documented success in restoration of vernal pool habitat restoration and maintenance. Contact information for the City's PWD Project Manager is provided below:

Contact: Mr. Sean Paver
City of San Diego
Public Works Department
525 B Street, Suite 750
San Diego, CA 92101
Office: 619-533-3629

The City PWD will be responsible for financing the installation, five-year maintenance program, and biological monitor of the proposed mitigation described in the plan.

3.2 Responsible Agencies

The City DSD will be responsible for issuing any necessary permits and reviewing and approving this plan.

Contact: Mr. Mark Brunette
City of San Diego
Development Services Department
1222 First Avenue, MS 301
San Diego, CA 92101-4101
Office: 858-654-4237

Table 1
VPHCP Conservation Objectives Consistency Analysis

Objectives	Restoration Goals	Consistency
Vernal Pool Objectives (Habitat Based)	Restore 19 vernal pool sites (within 12 complexes) to a "Level 1" (stewardship) management condition within the MHPA through implementation of the VPHCP Management and Monitoring Plan or Site-Specific Management Plans (that are consistent with the VPHCP goals and objectives).	The La Media Road Widening Project proposes to impact three vernal pools (0.125-acre), one inside the MHPA and two outside the MHPA. The Fire Rescue Air Operations Phase II Project proposes to impact six vernal pools (0.089 acre) outside of the MHPA. The projects propose to reestablish and restore vernal pools inside the MHPA at a 2:1 ratio in a configuration that maintains long-term viability of VPHCP covered species. The mitigation associated with these projects will increase the number of pools and basin surface area of conserved vernal pools within the MHPA. The restoration project will restore the J13N complex from a Level 3 to a Level 1 management condition. The J13N complex will be managed in perpetuity in accordance with the VPMMP.
Species-Specific Objectives	Restore specific complexes identified in Appendix A of the VPMMP to enhance covered species populations to ensure long-term viability.	The La Media Road Widening Project will impacts pools that are occupied by SDFS but are not within a complex identified in the VPHCP. The Fire Rescue Air Operations Phase II Project will impact pools occupied by SDFS located within Montgomery Field Complex (N 5-6). The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The VPHCP Conservation Objectives for SDFS states "Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP." The population of SDFS within Otay Mesa and the Montgomery Field Complex are currently stable and these projects will not impact any of the conserved vernal pools occupied by covered species. This project proposes to restore and re-establish vernal pools within the Otay 1-Acre Complex (J13N). This restoration work will address the Conservation/Restoration Objectives for the J13N Complex and Conservation/Restoration Objectives for spreading navarretia, San Diego button-celery, California Orcutt grass, Otay mesa mint and Riverside fairy shrimp. The restoration project will establish viable populations of these species.
Otay Mesa mint	Establish viable populations of Otay Mesa mint within the J13E, J13N, J16–18, J20–21, J27, and J28 complex series.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by Otay Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with these projects, restoration of vernal pools at the J13N Complex will occur. The restoration will incorporate Otay Mesa Mint to establish a viable population at J13N.

Table 1 VPHCP Conservation Objectives Consistency Analysis		
Objectives	Restoration Goals	Consistency
San Diego Mesa mint	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by San Diego Mesa mint, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP.
Spreading navarretia	Establish viable populations of spreading navarretia within J11E, J11W, J12, J13E, J13 N, J16–18, J20–21, J27, J28, and R1.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by spreading navarretia, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration plan will restore and incorporate spreading navarretia to establish a viable population at J13N.
San Diego button-celery	Establish a viable population of San Diego button-celery within J13E and J13N.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by San Diego button-celery, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with this project, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate San Diego button-celery to establish a viable population at J13N.
California Orcutt's grass	Establish viable populations of California Orcutt grass within J11E, J11W, J12, J13E, J14, J16-18, J20–21, J21, J27, and J28E.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by California Orcutt grass, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with these projects, restoration of vernal pools at the J13N Complex will occur. The restoration will restore and incorporate California Orcutt grass to establish a viable population.
Riverside fairy shrimp	Establish viable populations of Riverside fairy shrimp within J11E, J11W, J12, J13E, J13N, J14, J16-18, J20–21, J21, J27, and J28E.	The La Media Road Widening Project and the Fire Rescue Air Operations Phase II Project will not impact any vernal pools occupied by Riverside fairy shrimp, and all existing, occupied, and conserved vernal pools will continue to be managed consistent with the VPMMP. To offset impacts associated with these projects, restoration of vernal pools at the J13N Complex will occur. The restoration plan will incorporate Riverside fairy shrimp to establish a viable population.
San Diego fairy shrimp	Restoration is not necessary for this covered species, as the populations of this species are adequately conserved under the VPHCP.	The La Media Road Widening Project will impact pools occupied by SDFS. One of the pools being impacted is located within the MHPA and the other two pools are located outside the MHPA, but none of the pools are located within a VPHCP identified complex. The Fire Rescue Air

Table 1 VPHCP Conservation Objectives Consistency Analysis		
Objectives	Restoration Goals	Consistency
		Operations Phase II Project will impact pools occupied with SDFS. The pools being impacted are located outside of the MHPA, were not previously identified, and were not included as part of the Montgomery Field Complex. The populations of SDFS on Otay Mesa and within the Montgomery Field Complex are currently stable and these projects will not impact any of the conserved vernal pools occupied by SDFS.

Due to the location of the mitigation site on City-owned preserve lands, the City's Parks and Recreation Department will be responsible for overseeing the establishment and development of habitat during the five-year maintenance and monitoring period and beyond. The primary avenue for the City's participation is through the permitting process; reviewing and commenting on this plan, the construction documents, and subsequent annual reports; and inspecting and commenting on significant milestones involved in the implementation of this plan.

Contact: Mr. Mark Berninger
City of San Diego
Parks and Recreation Department
Office: 619-685-1314
mberninger@sandiego.gov

3.3 Vernal Pool Restoration Specialist

Overall supervision of the installation and maintenance of this restoration effort will be the responsibility of a vernal pool restoration specialist. The vernal pool restoration specialist must have at least seven years of vernal pool restoration and maintenance experience and be approved by the wildlife agencies and the City. The vernal pool restoration specialist will oversee the efforts of the installation/maintenance contractor for the life of the restoration. Specifically, the restoration specialist will educate all construction and maintenance personnel about restoration goals and requirements; inspect plant material; directly oversee vernal pool grading, planting, seeding, weeding, and other maintenance activities; and conduct regular monitoring as well as annual assessments of the restoration effort. The restoration specialist will provide the PWD Project Manager and contractor with a written monitoring memo, including a list of items in need of attention, after qualitative monitoring visits (see Section 4.5 and 5.0 for discussion of qualitative monitoring). The restoration specialist will prepare and submit annual monitoring reports.

3.4 Installation/Maintenance Contractor

The City PWD Project Manager will hire a qualified restoration contractor with at least seven years of applicable restoration experience, i.e., vernal pool restoration, sensitive plant species restoration, and native and non-native plant identification. The contractor will be a firm holding a valid C-27 Landscape Contracting License from the State of California, a valid Pest Control Business License, and a Qualified Applicator Certificate or Qualified Applicator License, with Category B, that will allow them to perform the required work for this restoration effort. The contractor may be from the same firm as the restoration specialist. The PWD Project Manager may change contractors at their discretion.

During the installation, the contractor will be responsible for initial weed control/dethatching, fencing/barrier installation, irrigation installation (if applicable), top soil salvage and translocation, and planting and seeding, as well as maintenance of the restoration site during the 120-day plant establishment period (PEP) and five-year maintenance period.

Following installation, the contractor will submit marked up as-built plans for all implementation activities to the PWD Project Manager. The contractor will be held responsible for meeting all PEP success criteria until formal sign-off of the PEP has been obtained from the restoration specialist, PWD Project Manager, City DSD staff, City MSCP staff, and wildlife agencies.

Following formal sign-off of the PEP, the contractor will be responsible for maintaining the mitigation site for a minimum of five years. During this period, the contractor will service the entire mitigation site according to the maintenance schedule (Section 5.0, below). Service will include, but not be limited to, weed control, irrigation maintenance (if applicable), trash removal, watering, dead plant replacement, re-seeding, and pest and disease management. All activities conducted will be seasonally appropriate and approved by the restoration specialist and PWD Project Manager. The contractor will meet with the restoration specialist and PWD Project Manager at the site when requested and will perform all checklist items in a timely manner as directed.

3.5 Grading Contractor

The installation contractor will hire a qualified grading contractor, if they are not capable of performing the grading themselves. The grading contractor will have at least five years of applicable vernal pool restoration experience working in and near vernal pools. The grading contractor must have demonstrated at least three projects with successful vernal pool creation, as determined by the basin’s ability to hold water after rainfall events and support both vernal pool endemic plants and fairy shrimp species. The contractor will be a firm holding a valid A General Engineering or C-27 Landscape Contracting License from the State of California that will allow them to perform the required work for this restoration effort. The PWD Project Manager may change contractors at their discretion.

During installation, the grading contractor will be responsible for topographic reconstruction and implementation of any best management practices required during grading.

3.6 Vernal Pool Biologist

The vernal pool biologist will work closely with the vernal pool restoration specialist to direct vernal pool restoration. The vernal pool biologist and vernal pool restoration specialist may be the same person provided all qualifications are met. The vernal pool biologist will have at least five years of vernal pool restoration experience and will be approved by the City and wildlife agencies. The biologist will possess a Section 10(a)1(A) Recovery Permit for Conducting Surveys for Listed Large Branchiopod Species and will directly supervise all work to be conducted in or adjacent to vernal pools known to support sensitive species.

3.7 Native Plant Nursery

Seed collection and bulking and container plant propagation will be conducted by a nursery that specializes in native plants and contract seed collection and growing. The nursery will have the appropriate collection permits for sensitive plant species and will have demonstrated experience in the collecting and bulking of vernal pool plant species seed. The nursery will be responsible for providing brief updates on the progress of seed collection and bulking activities to the restoration specialist and City PWD Biologist.

4.0 Implementation Plan

This section describes the design of the compensatory mitigation and how it will be implemented. Implementation of mitigation efforts will be conducted under the direction of a qualified vernal pool restoration specialist as defined in Section 3.3. All restoration and enhancement activities will commence the first summer–fall season prior to, or concurrently with, the initiation of project impacts.

4.1 Avoidance and Minimization Measures

During mitigation implementation, avoidance and minimization measures will be implemented to avoid impacts to existing vernal pools and to ensure that the existing hydrology (rainwater runoff and subsurface flows) of the preserved vernal pools is maintained or enhanced during grading, construction, and implementation. The VPHCP includes avoidance and minimization measures that are specific for construction or development projects rather than mitigation projects; however, these measures have been adapted and modified to ensure the protection of existing resources at the mitigation site. These measures help ensure avoidance of negative impacts to the existing vernal pools and their watersheds.

General avoidance and minimization measures will be implemented as follows:

Mitigation Site Design

1. Any development adjacent to the MHPA shall be constructed to slope away from the extant pools to be avoided, to ensure that runoff from the project does not flow into the pools.

2. Vernal pool topsoil will not be salvaged from the vernal pools to be impacted at the La Media Road Widening Project and the Fire-Rescue Air Operations Phase II construction sites. Occurrences of versatile fairy shrimp (*Branchinecta lindahli*) have been reported at the La Media Road Widening Project and the Fire-Rescue Air Operations Phase II site is located at Montgomery-Gibbs Executive Airport in Kearny Mesa, a significant distance north of the mitigation site, which raises concerns regarding genetic integrity of fairy shrimp.

   Prior to mitigation site grading, topsoil will be salvaged from existing pools that will be expanded through grading as described in Section 4.3.6.

3. Permanent protective fencing along any interface with developed areas and/or use of other measures approved by the City of San Diego to deter human and pet access to on-site habitat will be installed. Fencing will be shown on the development plans and should have no gates (accept to allow access for maintenance and monitoring of the mitigation area) and be designed to prevent intrusion by pets. Signage for the mitigation area will be posted and maintained at conspicuous locations. The requirement for fencing and/or other preventative measures is further discussed in Section 4.3.4.

During Mitigation Implementation

1. Temporary fencing (with silt barriers) will be required at the limits of the mitigation site (including implementation staging areas and access routes) to prevent additional vernal pool impacts and the spread of silt from the mitigation construction zone into adjacent vernal pools outside of the mitigation site. Fencing will be installed in a manner that does not impact native vegetation and existing vernal pools. Final construction plans will include photographs that show the fenced limits of impact and all areas of vernal pools to be impacted or avoided. If work inadvertently occurs beyond the fenced or demarcated limits of impact, all work will cease until the problem has been remedied to the satisfaction of the wildlife agencies and the City. Temporary construction fencing will be removed upon project completion.

2. Impacts from fugitive dust that may occur during vernal pool grading will be avoided and minimized through watering and other appropriate measures.

3. The qualified vernal pool biologist that has been approved by the City will be on-site as needed during implementation activities to ensure compliance with all mitigation measures identified in the CEQA environmental document. The biologist will perform the following duties:

    a. Oversee installation of and inspect the fencing and erosion control measures within or upslope of vernal pool restoration and preservation areas as needed, including daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.

    b. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

    c. Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented for construction personnel. At a minimum, training will include discussions of (1) the purpose for resource protection; (2) vernal pool species and their habitats; (3) the conservation measures that must be implemented during implementation to conserve the vernal pool species, including strictly limiting activities, vehicles, equipment, and construction materials to areas that require grading; (4) environmentally responsible construction practices as outlined in measures 4, 5, and 6 below; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program, the need to adhere to the provisions of the federal Endangered Species Act, and the penalties associated with violating the federal Endangered Species Act.

    d. Submit regular monthly letter reports to the City of San Diego Mitigation Monitoring and Coordination (MMC), City MSCP staff, and wildlife agencies during mitigation implementation and a final as-built report within 60 days following completion of construction. The final report will include as-built construction drawings with an overlay of habitat that was restored, final maximum extent of ponding for each vernal pool basin, general location of mounds, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved.

4. The following conditions will be implemented during project implementation:

    a. Employees will strictly limit their activities, vehicles, equipment, and implementation materials to the fenced project footprint.

    b. The project site will be kept as clean of debris as possible. All food-related trash items will be enclosed in sealed containers and regularly removed from the site.

    c. Disposal or temporary placement of excess fill, brush, or other debris will be limited to areas within the fenced project footprint.

5. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, and any other such activities will occur in designated areas as approved by the vernal pool biologist. These designated areas will be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent any runoff from entering the vernal pools or their watersheds and should be shown on the construction plans. Fueling of equipment will take place within existing disturbed areas greater than 100 feet from the vernal pools or their watersheds. Contractor equipment should be checked for leaks prior to operation and repaired as necessary. A spill kit for each piece of construction equipment should be on-site to be used in the event of a spill. “No-fueling zones” will be designated on construction plans.

6. Grading activities immediately adjacent to vernal pools will be timed to avoid wet weather to minimize potential impacts (e.g., siltation) to the vernal pools unless the area to be graded is at an elevation below the pools. To achieve this goal, grading adjacent to avoided pools will comply with the following:

   a. Grading will occur only when the soil is dry to the touch both at the surface and one inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and one inch below indicates whether the soil is dry.

   b. After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently as described above and no sooner than two days (48 hours) after the rain event ends.

   c. To prevent erosion and siltation from storm water runoff due to unexpected rains, best management practices (i.e., silt fences) will be implemented as needed during grading.

   d. If rain occurs during grading, work will stop and resume only after soils are dry, as described above.

   e. Grading will be done in a manner to prevent runoff from entering preserved vernal pools.

   f. If necessary, water spraying will be conducted at a level sufficient to control fugitive dust but not to cause runoff into vernal pools.

   g. If mechanized grading is necessary, grading will be performed in a manner to minimize soil compaction (i.e., use the smallest type of equipment needed to feasibly accomplish the work).

4.2 Preliminary Design and Engineering

This mitigation plan proposes restoration of 32 vernal pools and enhancement of 16 existing pools. The mitigation site contains a total of 24 existing vernal pools (labeled with an "E" on Figure 8). Existing pools are those that were either identified in the VPHCP or by RECON vegetation surveys conducted in 2019. The RECON vegetation surveys were used to refine the vernal pool boundaries presented in the VPHCP. In instances where the RECON boundaries differed from the VPHCP boundaries, the RECON boundaries were utilized. Eight of the 24 existing pools (E1, E2, E3, E18, E19, E20, E22, and E23) will be expanded and/or combined with other existing pools through minor grading. After grading, these eight existing pools will form five larger new pools with a new "VP" label (VP8, VP9, VP10, VP16, VP18, and VP23; see Figure 8 and Table 2). The existing basins will be enhanced and the extra acreage created/restored through expansion will count towards the City's mitigation credits. The remaining 15 existing pools that are not planned for grading will be enhanced through weeding, remedial seeding, and possible fairy shrimp inoculation. These pools will be referred to as "Enhanced Pools" and will keep the "E" label as shown on Figure 8. An additional 26 new pools will be created/restored through grading and are also labeled with a "VP" on Figure 8. For the purposes of this mitigation plan, all of the pools shown in Figure 8 will be collectively referred to as the "restored/enhanced pools", pools that will be graded will be referred to as "restored" and pools where no grading will take place will be referred to as "enhanced".

A hydrology study was prepared by Rick Engineering Company (2019) to confirm that each restored or enhanced vernal pool has sufficient watershed that a typical 1-year storm event would create 2 to 3 inches of ponding for a period of 14 days to support San Diego fairy shrimp or 21 days to support Riverside fairy shrimp. The hydrology study shows that all 32 proposed pools will, after a typical 1-year storm event, hold at least 2 to 3 inches of water for at least 14 days and 24 of the proposed pools will hold at least 2 to 3 inches of water for at least 21 days. Figure 9 shows the planned location of the vernal pools and their respective watersheds and flow patterns (this figure will be further refined as grading plans are prepared).

A minimum of 0.814 acre (35,443 square feet) of new vernal pool surface area will be restored through topographic recontouring/grading, soil translocation, seed collection and dispersal, and continued maintenance and monitoring. An additional 0.150 acre (6,524 square feet) of existing vernal pools (pools identified by the City's VPHCP or by vegetation surveys conducted in March 2019) will be enhanced through hand weeding, soil translocation, seed collection and dispersal, and continued maintenance and monitoring.

Image Source: NearMap (Flown September 2019)

Project Boundary

E# Existing Pools to be Enhanced

VP# Restored Vernal Pools

Deepest Point of Pool

M# Mounds to be Established

0 Feet 100

RECON

M:\JOBS5\9227\common_gis\fig8_vpmit.mxd 11/21/2019 bma

FIGURE 8

Mitigation Site Restoration Plan

Table 2 Restored and Enhanced Vernal Pools										
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP1		971		971	12.0	3.4	2.7		CALMAR DOWCUS ERYARI MYOMIN NAVFOS ORCCAL TRISCI	
VP2		626		626	12.0	6.7	6.0		CALMAR ELEMAC ERYARI ORCCAL TRISCI	
VP3		1,560		1,560	12.0	2.9	2.2	PSIBRE	CALMAR DOWCUS ERYARI MYOMIN NAVFOS ORCCAL TRISCI	
VP4		853		853	8.0	2.9	2.2		DOWCUS MYOMIN NAVFOS	
VP5		980		980	12.0	8.0	7.3	PSIBRE	CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	
VP6		1,009		1,009	12.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	

Table 2 Restored and Enhanced Vernal Pools										
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP7		874		874	12.0	2.6	1.9		DOWCUS MYOMIN NAVFOS	
VP8	E22, E23	1,135	152	984	12.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS	
VP9	E18	699	12	687	12.0	3.0	2.3		DOWCUS MYOMIN NAVFOS ORCCAL	
VP10	E19, E20	1,047	240	807	8.0	2.7	2.0		CALMAR DOWCUS ERYARI MYOMIN NAVFOS ORCCAL TRISCI	
VP11		1,177		1,177	6.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP12		1,262		1,262	12.0	2.7	2.0		CALMAR DOWCUS ERYARI MYOMIN NAVFOS ORCCAL TRISCI	

Table 2
Restored and Enhanced Vernal Pools

Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP13		1,606		1,606	12.0	3.0	2.4		CALMAR DOWCUS ERYARI MALLEP MYOMIN NAVFOS ORCCAL TRISCI	
VP14		1,505		1,505	12.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP15		689		689	12.0	2.8	2.1		DOWCUS MYOMIN NAVFOS	
VP16	E1	1,470	192	1,278	8.0	4.4	3.7	PSIBRE	CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	
VP17		1,091		1,091	12.0	3.0	2.3		CALMAR DOWCUS ERYARI MYOMIN NAVFOS ORCCAL TRISCI	
VP18	E2	2,797	1,403	1,394	12.0	2.6	1.9	PSIBRE (5-10%), ERYARI, CRETRU (<1%), DEIFAS (<1%), ELEMAC (5-10%), MALLEP (5-10%),	CALMAR ELEMAC ERYARI MALLEP TRISCI	BROMAD (<1%), EROBOT (<1%), FESPER (50-75%), HORMAR (5-10%)

Table 2 Restored and Enhanced Vernal Pools										
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP19		1,235		1,235	12.0	2.7	2.0		CALMAR DOWCUS ERYARI MALLEP MYOMIN NAVFOS TRISCI	
VP20		1,346		1,346	12.0	3.7	3.0	LEPLAT	CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	
VP21		1,691		1,691	12.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP22		1,059		1,059	12.0	2.6	1.9		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP23	E3	1,249	118	1,131	12.0	2.7	2.0	PSIBRE	CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	

Table 2 Restored and Enhanced Vernal Pools										
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP24		1,052		1,052	12.0	2.7	2.0		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP25		947		947	12.0	2.8	2.1		DOWCUS MYOMIN NAVFOS	
VP26		2,128		2,128	12.0	2.7	2.0		CALMAR DOWCUS ERYARI MYOMIN NAVFOS TRISCI	
VP27		713		713	12.0	6.4	5.7	PSIBRE	CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	
VP28		1,203		1,203	12.0	4.3	3.6		CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	
VP29		695		695	12.0	5.8	5.1		CALMAR ELEMAC ERYARI MALLEP ORCCAL TRISCI	

Table 2
Restored and Enhanced Vernal Pools

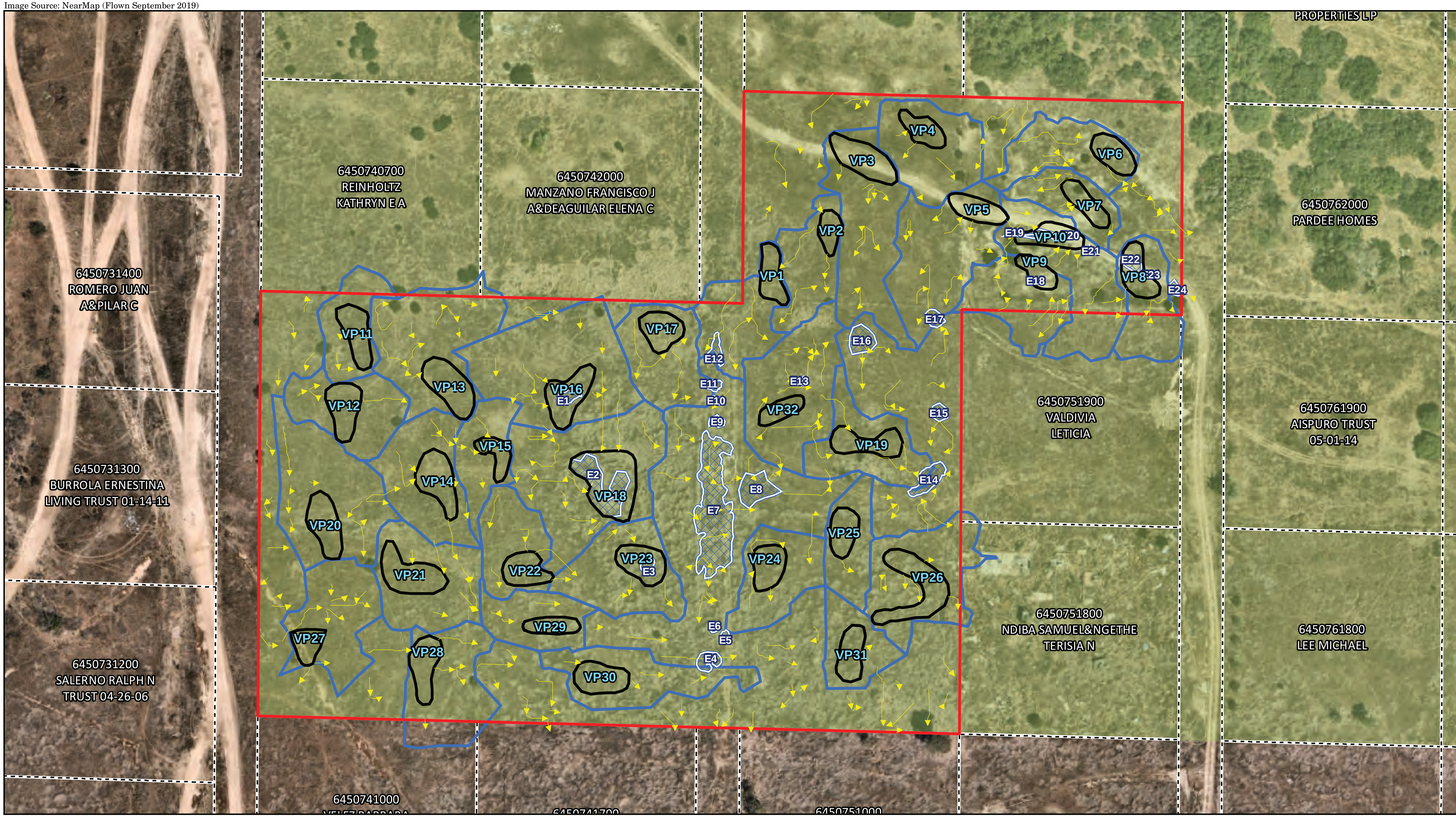
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
VP30		1,215		1,215	12.0	2.9	2.2		CALMAR DOWCUS ELEMAC ERYARI MYOMIN NAVFOS TRISCI	
VP31		1,020		1,020	12.0	2.8	2.1		CALMAR DOWCUS ERYARI MYOMIN NAVFOS	
VP32		655		655	12.0	2.9	2.2		DOWCUS MYOMIN NAVFOS	
	E4	280	280					PSIBRE	[4]	
	E5	74	74					PSIBRE	[4]	
	E6	53	53					PSIBRE	[4]	
	E7	3,300	3,300					PSIBRE (25-50%), NAVFOS, ORCCAL, ELEMAC (<1%), DEIFAS (1-5%), LEPNIT (<1%), LYSMIN (<1%), MALLEP (5-10%)	[4]	ATRSEM (<1%), BROHOR (<1%), BROMAD (<1%), EROBOT (1-5%), FESPER (50-75%), HORMAR (<1%), HYPGLA (<1%), LACSER (<1%), LYTHYS (<1%), MESNOD (<1%), PHAAQU (1-5%), PHAMIN (<1%), SALTRA (<1%), SONASP (<1%), SPEBOC (<1%)
	E8	750	750					PSIBRE	[4]	

Table 2 Restored and Enhanced Vernal Pools										
Proposed Pool Number	Overlap with Existing Pool	Proposed Final Size (sq. ft.)	Existing Pool Size (total if multiple pools)	Increase in Size (sq. ft.)	Target Depth	Ponding Depth After 14 days[1]	Ponding Depth After 21 days[1]	Existing Native Species[2, 3]	Target Native Vernal Pool Species[4]	Existing Non-native Species[3]
	E9	112	112						4	
	E10	61	61					PSIBRE	4	
	E11	116	116					PSIBRE	4	
	E12	222	222					PSIBRE	4	
	E13	29	29						4	
	E14	514	514						4	
	E15	180	180						4	
	E16	501	501						4	
	E17	203	203					PSIBRE	4	
	E21	23	23						4	
	E24	130	130						4	
TOTAL		**44,107**	**8,664**	**35,443**						
Created square feet				*35,443*						
Enhanced square feet				*8,664*						

[1]SOURCE: Rick Engineering 2019, depth of restored pools remaining after 1-year storm event
[2]SOURCE: VPHCP (City of San Diego 2017b and RECON 2019)
[3]Cover data only available for two pools, from City of San Diego 2019 surveys.
[4]CRAAQU, DESDAN, JUNBUF, LYSMIN, PILAME, PLAACA, PLAELO, POGNUD, PSIBRE targeted to be present in all pools.

Key for Species:
ATRSEM = *Atriplex semibaccata*
BROHOR = *Bromus hordeaceus*
BROMAD = *Bromus madritensis rubens*
CALMAR = *Callitriche marginata*
CRAAQU = *Crassula aquatica*
CRETRU = *Cressa truxillensis*
DEIFAS = *Deinandra fasciculata*
DESDAN = *Deschampsia danthonioides*
DOWCUS = *Downingia cuspidata*
ELEMAC = *Eleocharis macrostachya*
EROBOT = *Erodium botrys*
ERYARI = *Eryngium aristulatum*
FESPER = *Festuca perennis*
HORMAR = *Hordeum marinum*
HYPGLA = *Hypochaeris glabra*
JUNBUF = *Juncus bufonius*
LACSER = *Lactuca seriola*
LEPLAT = *Lepitium latifolium*
LEPNIT = *Lepidium nitidum*
LYSMIN = *Lysimachia minima*
LYTHYS = *Lythrum hyssopifolia*
MALLEP = *Malvella leprosa*
MESNOD = *Mesembryanthemum nodiflorum*
MYOMIN = *Myosurus minimus*
NAVFOS = *Navarettia fossalis*
PHAAQU = *Phalaris aquatica*
PHAMIN = *Phalaris minor*
PILAME = *Pilularia american*
PLAACA = *Plagiobothrys acanthocarpus*
PLAELO = *Plantago elongata*
POGNUD = *Pogogyne nudiuscula*
PSIBRE = *Psilocarphus brevissimus*
SALTRA = *Salsola tragus*
SONASP = *Sonchus asper*
SPEBOC = *Spergularia bocconi*
TRISCI = *Triglochin scilloides*

Image Source: NearMap (Flown September 2019)



Project Boundary
Existing Pools to be Enhanced
Restored Vernal Pools
Surface Flow
Drainage Basins
Parcel Boundary
Multi-Habitat Planning Area

0 Feet 100

RECON

M:\JOBS5\9227\common_gis\fig9_vpmit.mxd 5/27/2020 ccn

FIGURE 9

Restored Vernal Pool Watersheds and Flow Patterns

In addition, the mitigation will consist of 6.666 acres of upland watershed that will be restored to native maritime succulent scrub (MSS) habitat on the mima mounds and native herbs, grasses, and forbs in the interspaces. Otay Mesa historically supported MSS habitat and establishing MSS at this site is an appropriate goal. However, if on-site trends (i.e., low container plant survival, lack of recruitment) indicate that MSS habitat may not be appropriate, adaptive management measures (i.e., replanting and reseeding) will utilize species that are already performing well on-site. This may result in upland habitat that is more indicative of Diegan coastal sage scrub, such as that already present in the northeastern corner of the site. Restoration will occur through weed dethatching, barrier installation, native plant and seed introduction, and continued maintenance and monitoring. Implementation activities are described in more detail in Section 4.3, and ongoing maintenance and monitoring activities are discussed in Sections 5.0 and 7.0.

4.3 Implementation Activities

Implementation activities include seed collection and bulking, non-native weed dethatching, topographic recontouring/grading, barrier/signage installation, irrigation system installation, vernal pool soil salvage and translocation, and planting and seeding. The implementation schedule is shown in Table 3. Implementation will commence prior to or concurrently with the start of construction of the project.

All final specifications and topographic-based grading, planting, and watering plans will have 0.2-foot contours for the vernal pools, watersheds, and surrounding uplands (including adjacent mima mounds) at the restoration site. The basis for this fine-scale resolution is the micro-depth (i.e., several inches) of the vernal pools that will be restored. The grading plans will also show the watersheds of existing vernal pools and overflow pathways that hydrologically connect the restored pools in a way that mimics natural vernal pool complex topography and hydrology.

Table 3
Implementation Schedule

Task	Time of Year
Seed Collection and Bulking	Spring/Summer for vernal pool seed and annual upland seed, Summer/Fall for perennial upland seed
Non-native Weed Dethatching	Summer/Fall (prior to grading)
Topographic Recontouring/Grading	Summer/Fall (prior to start of wet season)
Barrier/Signage Installation	Fall (after grading)
Irrigation System Installation	Fall (after grading)
Vernal Pool Soil Salvage	Summer/Fall (prior to start of wet season)
Vernal Pool Soil Translocation	Winter[1]
Maritime Succulent Scrub Plant and Seed Installation	Winter
Vernal Pool Hand Seeding	Winter[1]

[1]After vernal pool hydrology accepted

4.3.1 Seed Collection and Bulking

Seed collection should begin immediately and should be conducted within the mitigation site vicinity. Species recommended for collection are shown in Table 4 and will be used for container plant propagation, seed bulking, and hand seeding. The Species-Specific Objectives in the VPMMP (City of San Diego 2017b) for vernal pool complex J 13 N include protecting and managing populations of San Diego button celery, spreading navarretia, and Orcutt's grass and establishing viable populations of Otay Mesa mint. Collection of seed from these four species will be of particular importance during the mitigation project.

Seed should be collected first from existing on-site pools that support endemic vernal pool plant species. If adequate seed cannot be obtained on-site, then an alternate site located on Otay Mesa site will be used upon approval by the City. Nearby vernal pool complexes owned by the City that may be targeted for seed collection include Cal Terraces and Goat Mesa (see Figure 4). If seed cannot be obtained from within these parameters, seed collected within San Diego County at a similar elevation to the mitigation site or commercial sources may be acceptable with consultation with the restoration specialist and the City PWD Biologist and approval by the City and wildlife agencies. Care will be taken to avoid collection of soil during seed collection as fairy shrimp eggs may be mixed with the seed and soil. The sources and proof of local origin of all plant material and seed will be provided to the City prior to dispersal.

Seed bulking and plant propagation should begin as soon as possible by a qualified native plant nursery as defined in Section 3.7. Seed collected or procured for the project will be used for container plant propagation in the species and quantities discussed in Section 4.3.7. Container plants will be inoculated with mycorrhizae (mutualistic fungi) by using native soil that contains fungi and other microorganisms. Providing the necessary microorganisms can increase outplanted plants survival rates (Allen 1988). Seed bulking includes propagating container plants specifically for the purposes of seed production. Container plants will be sown and grown under ideal conditions, allowed to germinate and flower, and all resulting seed will be harvested, rough cleaned, and stored for hand seeding. Species that will be targeted for bulking are shown in Table 4.

Vernal pool species will be introduced to the site through either soil transfer or seed collection and dispersal. The hand-collected vernal pool seeds will be distributed in the newly established vernal pools according to the planting plan outlined in Section 4.3.9 or at the discretion of the restoration specialist.

Table 4 Plant Species Targeted for Collection	
Plant Species	Common Name
Upland Maritime Succulent Scrub Species	
Acmispon glaber[1]	Deerweed
Amsinkia menziesii[1]	Common fiddleneck
Artemisia californica[1]	California sagebrush
Artemisia chenopodifolia	San Diego bur-sage
Atriplex pacifica	South coast saltbush
Bahiopsis laciniata	San Diego sunflower (viguiera)
Bergerocactus emoryi	Golden cereus
Brodiaea terrestris[2]	Dwarf brodiaea
Bothriochloa barbinodis	Cane bluestem
Cylindropuntia prolifera[1]	Coast cholla
Dichelostemma capitatum[1, 2]	Blue dicks
Distichlis spicata[1]	Salt grass
Dodecatheon clevelandii[2]	Padre's shooting star
Encelia californica	California encelia
Eriogonum fasciculatum[1]	California buckwheat
Eriophyllum confertiflorum	Golden yarrow
Euphorbia misera	Cliff spurge
Ferocactus viridescens	Coast barrel cactus
Isomeris arborea	Bladderpod
Lasthenia californica[2]	Goldfields
Linanthus dianthiflorus[1, 2]	Ground pink
Lupinus bicolor[1]	miniature lupine
Lupinus truncatus[1]	collar lupine
Lycium californicum	California desert thorn
Microseris douglasii var. *platycarpa*[1, 2]	Silverpuffs
Muilla maritima[1, 2]	Common muilla
Opuntia littoralis	Coast prickly pear cactus
Plantago erecta[1, 2]	Dot-seed plantain
Simmondsia chinensis[1]	Jojoba
Sporobolus airoides	Alkali sacaton
Stipa pulchra[2]	Purple needlegrass
Trifolium willdenovii[1]	Tomcat clover
Vernal Pool Plant Species	
Callitriche marginata[3]	Water-starwort
Crassula aguatica[1, 3]	Stone-crop
Deschampsia danthonioides[2]	Annual hairgrass
Downingia cuspidata[2]	Toothed calico flower
Eleocharis macrostachya[1, 2]	Pale spikerush
Eryngium aristulatum var. *aristulatum*[1, 2,4,5]	San Diego button-celery
Juncus bufonius[1, 2]	Toad rush
Lysimachia minima[1]	chaffweed
Malvella leprosa[1]	Alkali mallow
Myosurus minimus[2]	Little mouse tail
Navarretia fossalis[4,5]	Spreading navarretia
Orcuttia californica[4,5]	California Orcutt's grass
Pilularia americana[1,3]	American pillwort
Plagiobothrys acanthocarpus[1, 2]	Adobe popcornflower
Plantago elongata[1, 2]	Plantain

Table 4 Plant Species Targeted for Collection	
Plant Species	Common Name
Pogogyne nudiuscula[2,5]	Otay Mesa mint
Psilocarphus brevissimus[1]	Dwarf woollyheads
Triglochin scilloides[3]	Flowering quillwort

SOURCE: VPHCP (City of San Diego 2017a)
[1]Observed at mitigation site during 2019 vegetation surveys
[2]To be bulked at a native plant nursery
[3]To be targeted for introduction to the site via soil collection
[4]Identified as occurring on-site per the VPHCP
[5]Required per VPMMP Species – Specific Objectives (City of San Diego 2017b)

4.3.2 Non-native Weed Dethatching

Prior to topographic recontouring and outside of the bird breeding season (February 15 through August 15), crews familiar with native and non-native plants will remove the accumulated weedy thatch throughout the mitigation site through the use of line trimmers and rakes. If dethatching must occur during the bird breeding season, a nesting bird survey will be conducted by a qualified biologist before work begins. Cut material will be raked into piles, removed from the site, and taken to a landfill or put into a green waste dumpster for disposal. Removal of the weedy thatch material will enable the project biologist and heavy equipment operator to see the soil surface so that the proper vernal pool elevations could be contoured. Removal of the thatch will also aid in preparing the site for container plant installation, creating space for hand seeding of native annual species, and reducing future weed growth, which could be aided by the mulching effect of the thatch.

4.3.3 Topographic Recontouring/Grading

Topographic recontouring, or grading, at the site will be implemented to create mound and basin topography typical of vernal pool habitats on Otay Mesa. The result will be the establishment of natural watershed topography with the ability to capture and retain precipitation for the restored/enhanced vernal pools.

The primary physical change accomplished by grading will be the redistribution of a portion of the soil surface to establish (i.e., excavate) new vernal pool basins and allow ponding and water retention. Excess material displaced by the excavation process will be used to construct low mounds as shown on Figure 8. Mounds will placed in a manner that enhances the local watershed of the complex by encouraging ponding of restored/enhanced pools and improving hydrologic connectivity between pools.

Existing vernal pools on-site will be either left as is or expanded (see Figure 8). Expansion of existing pools will include light grading along the pool's edges to improve the pool's ponding capabilities, erase tire ruts, and manipulate soil to create greater topographic complexity.

Grading activities will be timed to avoid wet weather in order to minimize potential impacts (e.g., siltation) to the existing vernal pools. To ensure that potential impacts to the existing vernal pools are avoided, grading activities will be performed consistent with the following:

- Grading will occur only when the soil is dry to the touch at the surface and one inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and one inch below indicates the soil is dry.

- After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently as described above and no sooner than two days (48 hours) after the rain event ends.

- Grading will commence only when no rain is forecasted during the anticipated grading period. If rain occurs during grading, work will stop and resume only after soils are dry.

- Grading will be done in a manner to prevent silt from entering the preserved vernal pools. To prevent erosion and siltation from storm water runoff due to unexpected rains, best management practices (e.g., silt fences or other means such as fiber rolls) will be implemented as needed during any recontouring work.

The grading will be conducted under the direction of a qualified vernal pool restoration specialist, as described in Section 3.3. Areas that are to remain unaffected by grading activities will be marked prior to implementation. The grading will be implemented using a small bulldozer or skidsteer, as deemed appropriate by the grading contractor. The machine operator will also be experienced in vernal pool restoration work.

After grading, cobble generated by grading activities will be placed within the vernal pool basins to provide topographic complexity to the basin bottoms. After grading and prior to container plant installation, the maximum potential ponding area of the newly established vernal pools will be surveyed to ensure that the boundary for each pool does not differ by more than 10 percent from the target areas. High resolution aerial photography will be captured using a professional small unmanned aerial vehicle (sUAV). Using industry standard photogrammetry software and procedures, a digital surface model (DSM) will be generated using the data collected by the sUAV. The as-built grading plans and report figures will include vernal pool boundaries and 0.2-foot contours, both of which will be derived from the DSM, and will be replotted at 1 inch equals 40 feet.

4.3.4 Barrier/Signage Installation

Protection of the mitigation site from human disturbance is essential for success. Of particular importance is protection of the mitigation site from pedestrians and off-road vehicles. Concurrent with topographic recontouring, a temporary fence will be erected and maintained around the perimeter of the mitigation site to bar unauthorized vehicle access. Once the topographic recontouring is complete, the mitigation site will be permanently fenced with chain-link and three-strand barbless wire fencing in consultation with the City. Chain-link will be installed on the north, west, and south project limits where adjacent planned development presents an increase probability of trespassing. Three-strand barbless wire will be installed on the eastern limits and along the edge of Dillon Canyon to allow for wildlife movement through the site. In addition, signs will provide notice that the area is an ecological preserve, notify that trespassing is prohibited, and cite penalties for trespass violation, including liability for repair of any damage to soil or biological resources within the barrier. Signs in both Spanish and English will be mounted at approximately 200-foot intervals around the mitigation site.

4.3.5 Irrigation System Installation

If a point of connection to a reliable water source is available at the time of mitigation implementation, a temporary aboveground irrigation system will be installed within areas planned to receive container plants in the upland MSS habitat at the restoration contractor's discretion and with the approval of the City PWD Biologist. The irrigation system will be field fit to ensure adequate irrigation coverage to all installed container plants to the extent practicable with avoidance of overspray into the vernal pool basins. At no point will irrigation water that results in pooling of water be allowed to enter the vernal pool basins. The system will also be installed with hose bibs to allow for hand watering of container plants that cannot be watered by the system due to their proximity to vernal pools.

If a reliable point of connection is not available at the time of container plant installation, all container plants and germinating upland seed will be watered by water truck and hoses. The water truck will fill up at the closest fire hydrant using the appropriate water meter (mostly likely City of San Diego).

4.3.6 Salvage and Translocation of Vernal Pool Soil for Fairy Shrimp

Vernal pool soil will not be salvaged from the vernal pools to be impacted at the La Media Road Widening Project and the Fire-Rescue Air Operations Phase II construction sites. Occurrences of versatile fairy shrimp (*Branchinecta lindahli*) have been reported at the La Media Road Widening Project and the Fire-Rescue Air Operations Phase II site is located at Montgomery Field in Kearny Mesa, a significant distance north of the mitigation site, which raises concerns regarding genetic integrity of fairy shrimp.

The City owns and manages several nearby vernal pool complexes on Otay Mesa (i.e., Cal Terraces, Goat Mesa) where versatile fairy shrimp have not been observed or are known to be present in a few limited vernal pools. Soil from nearby vernal pools containing San Diego and Riverside fairy shrimp eggs will be collected and used to inoculate all of the restored/enhanced pools where fairy shrimp are not already present. Vernal pools known to support versatile fairy shrimp will not be targeted for collection of soil.

Necessary criteria for this mitigation plan include establishment of populations of Riverside fairy shrimp. Establishment of San Diego fairy shrimp is desirable but not required as they are adequately conserved under the VPHCP (City of San Diego 2017a). Following topographic recontouring, the newly established vernal pools will be inoculated with shrimp egg–bearing soils collected from nearby pools only after the newly established vernal pools have demonstrated suitable hydrologic conditions (i.e., at least 14 to 21 days for San Diego fairy shrimp and 21 to 28 days for Riverside fairy shrimp). Fairy shrimp eggs will be introduced into these vernal pools following the guidelines listed below.

The following translocation guidelines will be adhered to for the fairy shrimp translocation effort:

- Egg-bearing soil (inoculum) will be collected when it is dry to avoid damaging or destroying fairy shrimp eggs, which are fragile when wet.

- A hand trowel or similar instrument will be used to collect the top two inches of soil from the pools. Whenever possible, soil will be collected in chunks. The trowel will be used to pry up intact chunks of sediment, rather than loosening the soil by raking and shoveling, which can damage the eggs. The soil from donor pools will be stored individually in labeled boxes with adequate ventilation and away from direct sunlight. Salvaged soil will be kept at an approved seed storage facility that provides the appropriate conditions of light and temperature.

- Prior to placing any salvaged egg-bearing soil into the restored/enhanced pools, the pools will have been surveyed for versatile fairy shrimp to the satisfaction of the wildlife agencies and the City. Versatile fairy shrimp are undesirable in vernal pools as they can be considered weedy and possibly hybridize with sensitive fairy shrimp species. The survey will consist of soil collection and testing for the presence of the versatile fairy shrimp. If the soil contains versatile fairy shrimp cysts, then inoculum will not be introduced until measures approved by the above agencies have been implemented to remove the versatile fairy shrimp from the pools.

- Salvaged soil will be dispersed into the bottoms of the restored/enhanced vernal pools to give the greatest chance for the material to be inundated during the rainy season. Inoculum will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp eggs within the surface layer of soil (e.g., collected inoculum will be shallowly distributed within the pool so that eggs have the potential to be brought into solution upon inundation).

- Inoculum will not be introduced until the restored/enhanced vernal pool basins have demonstrated the ability to retain water for the appropriate amount of time to support San Diego fairy shrimp (i.e., at least 14 to 21 days) and Riverside fairy shrimp (i.e., at least 21 to 28 days), as approved by the wildlife agencies and the City.

- Inoculum from different source pools will not be mixed for translocation to any restored/enhanced vernal pools.

4.3.7 Maritime Succulent Scrub Plant and Seed Installation

Planting of the upland watersheds will occur following site preparation and after the first significant rain of the rain season. See Table 3 for the seeding and planting schedule.

Approximately 7.1 acres of watershed will be restored to MSS. The portion of the mitigation site to be restored currently supports non-native grassland and disturbed land. The areas immediately southeast and southwest of the mitigation site contain non-native grasslands with MSS. The restoration of native plant communities will be based on a principle of reestablishing suitable soil conditions (i.e., mycorrhizal fungi) and native seed banks, and reintroduction of native shrub and herbaceous species. The container plant palette for the MSS restoration are listed in Table 5 and includes species indicative of MSS habitat as well as species more typical of coastal sage scrub and grasslands to provide a plant palette that will readily establish on mounds and vernal pool interspaces.

All plant material will be installed in a way that mimics natural plant distribution. In general, larger shrub species will be installed on mounds with smaller shrubs and grass species installed in the pool and mound interspaces, at the direction of the restoration specialist (see Table 5). Bulbs will be installed within the same planting hole as the purple needlegrass (*Stipa pulchra*) and foothill needlegrass (*Stipa lepida*) container plants. Container plants will be installed using standard horticultural practices, using a hole at least twice the diameter of the root ball. All plants will be thoroughly watered in their pots before planting, as will the soil in all planting holes. Each container plant will be installed with a small two- to three-inch berm or planting basin approximately 24 inches in diameter around the edge of the plant to hold irrigation water.

Table 5 Container Stock for the Maritime Succulent Scrub Restoration			
Scientific Name	Common Name	Size	Number per Acre
Mound Installation			
Artemisia californica	California sagebrush	1-gallon	200
Atriplex pacifica	South coast saltbush	1-gallon	100
Bahiopsis laciniata	San Diego sunflower (viguiera)	1-gallon	200
Bergerocactus emoryi	Golden cereus	1-gallon or cuttings	50
Bothriochloa barbinodis[1]	Cane bluestem	1-gallon	100
Cylindropuntia prolifera	Coast cholla	1-gallon or cuttings	100
Encelia californica	California encelia	1-gallon	150
Euphorbia misera	Cliff spurge	1-gallon	200
Ferocactus viridescens	Coast barrel cactus	1-gallon	10
Lycium californicum	California desert thorn	1-gallon	100
Opuntia littoralis	Coast prickly pear cactus	1-gallon or cuttings	100
Simmondsia chinensis	Jojoba	1-gallon	250
		TOTAL	**1,560**
Interspace Installation			
Artemisia chenopodifolia	San Diego bur-sage	1-gallon	150
Brodiaea terrestris[2]	Dwarf brodiaea	bulb	25
Dichelostemma capitatum[2]	Blue dicks	bulb	50
Distichlis spicata	Salt grass	Rose-pot	1,000
Eriogonum fasciculatum	California buckwheat	1-gallon	100
Isomeris arborea	Bladderpod	1-gallon	125
Muilla maritima[2]	Common muilla	bulb	50
Sporobolus airoides	Alkali sacaton	1-gallon	300
Stipa lepida	Foothill needlegrass	1-gallon	750
Stipa pulchra	Purple needlegrass	1-gallon	1,500
		TOTAL	**2,550**
[1]To be installed on north sides of mounds [2]Bulb species to be installed within the planting hole of purple or foothill needlegrass container plants			

4.3.8 Hand Seeding

The site will be hand-seeded with native seed purchased from the approved native plant nursery. The areas to receive seed, the upland interspaces, and edges of mounds, will be lightly raked prior to a depth of 0.5-inch to ensure good soil to seed contact. All species of seed will be mixed together with an inert material, such as sand or rice hulls, and applied to the freshly raked areas through hand broadcasting. Seed will be applied during the late winter months, immediately prior to (within 48 hours) a forecasted rain event of 0.25 inch or more. Table6 includes a recommended seed list and appropriate quantities; this list may be adjusted based on the results of seed collection and in consultation with the restoration specialist and City PWD Biologist and approval by the City and wildlife agencies.

Table 6 Seed Mix for the Maritime Succulent Scrub Restoration		
Scientific Name	Common Name	Pounds per Acre
Acmispon glaber	Deerweed	1.0
Amsinkia menziesii	Common fiddleneck	0.25
Eriophyllum confertiflorum	Golden yarrow	2.0
Lasthenia californica	Goldfields	1.0
Linanthus dianthiflorus	Ground pink	0.5
Lupinus bicolor	Miniature lupine	1.0
Lupinus truncatus	Collar lupine	1.0
Malvella leprosa	Alkali mallow	0.25
Microseris douglasii	Silverpuffs	0.5
Plantago erecta	Dot seed plantain	2.0
Stipa pulchra	Purple needlegrass	4.0
Trifolium willdenovii	Tomcat clover	0.25
	TOTAL	**10.5**

4.3.9 Establishment of Vernal Pool Vegetation

Establishment of vernal pool habitat requires the reintroduction of vernal pool target plant species, in addition to the physical topographic recontouring described above. The establishment or enhancement of vernal pool habitat can be greatly accelerated by the active transport of propagules from donor sites into the new vernal pools and associated watershed (Scheidlinger et al. 1985). This will be accomplished by one or a combination of the following:

- The redistribution of topsoil containing seeds, spores, bulbs, and other propagules salvaged from on-site vernal pools. Table 4 identifies species to be targeted for seed or soil collection. Species that are more readily collected and dispersed by soil collection and are known to occur on-site include stone-crop (*Crassula aquatic*) and American pillwort (*Pilularia americana*). Additional species that are more readily collected and dispersed by soil collection but are not known to occur on-site include water-starwort (*Callitriche marginata*) and flowering quillwort (*Triglochin scilloides*). Soil containing these species will be collected from City-owned pools on Otay Mesa known to support these species and do not support versatile fairy shrimp.

- If necessary, the use of vernal pool soil from an off-site source approved by the wildlife agencies and the City.

- Collection and dispersal of vernal pool soil will follow the methods described in Section 4.3.6.

- The use of locally collected vernal pool seed from within Otay Mesa. Vernal pool seed will be directly dispersed in the basins or will be used for bulking at a native plant nursery per Section 4.3.1.

- The vernal pools will only be seeded and/or inoculated with soil after they have been shown to have hydrology adequate to support vernal pool species (i.e., hold water for seven consecutive days).
- Care will be taken when hand seeding vernal pool species to ensure that species are seeded into pools that have the appropriate hydrology to support the species. In addition, species that tend to more readily colonize will not be seeded with species that are more easily out competed.
- Pools and species to be hand seeded will be approved by the qualified restoration specialist.

In the event that natural rain is inadequate to support plant establishment during the initial reintroduction of vernal pool plants, artificial watering of the restored/enhanced pools and their watersheds may be done upon approval by the wildlife agencies and the City in order to establish plants but not hydrate shrimp. Any artificial watering will be done in a manner that prevents ponding in the pools. Only water identified and documented to be free of contaminants that could harm the pools or target species will be used.

Soil will be spread evenly over the surface, no more than 0.25-inch deep. If any ponding water is present at the time of soil inoculation, the soil will only be placed on the wet soil adjacent to the ponded areas. Soil will be placed into the bottoms of the restored/enhanced pools in a manner that preserves, to the maximum extent possible, the orientation of the plant seeds within the surface layer of soil (e.g., collected soil will be shallowly distributed within the pond so that seeds have the potential to be brought into solution upon inundation).

4.4 As-Built Reporting

At the completion of implementation, the installation will be approved by the City PWD Biologist; City DSD, MMC, and MSCP staff; and wildlife agencies. The installation/maintenance contractor will submit an as-built report that documents implementation activities and the dates they were completed. The report will include but not be limited to dates of on-site work, location and size of vernal pools basins, final plant and seed lists and quantities, and modifications to the mitigation site design that occurred through consultation with the restoration specialist and City PWD Project Manager. The report may be a brief letter report with photos of the final site design and figures with locations of site elements. Figures will include the results of the DSM created after vernal pool grading.

4.5 120-day PEP

The 120-day PEP will begin once the implementation activities are approved by the City, likely once all container plants and native seed have been installed. The PEP will last for 120 calendar days and will consist of all maintenance activities and methods discussed in Section 5.0. Regular (at least once per week) qualitative monitoring will be conducted to assess native container plant establishment and non-native weed germination and make recommendations for maintenance activities, as needed (Table 7). At the end of the PEP, any dead container plants will be replaced in kind and the site will be free of non-native weed species. Year 1 will begin after successful completion of the PEP and any required remedial container plant installation has been completed. At the completion of the PEP, the restoration specialist will prepare a letter report for submittal to the City DSD, MMC, and MSCP staff, and wildlife agencies to document activities conducted during the PEP and the site progress towards final success criteria.

Table 7
Vernal Pool and Watershed Maintenance Schedule

Task	120-day PEP	Year 1	Year 2	Year 3	Year 4	Year 5
Weed Control (herbicide treatment)	As needed	Monthly[1]	Monthly[1]	5 to 6 times per year[1]	4 to 5 times per year[1]	4 times per year[1]
Weed Control (hand pulling – vernal pools)	As needed	3 times per year[1]	3 times per year[1]	2 times per year[1]	2 times per year[1]	2 times per year[1]
Watering	As needed	As needed	As needed	As needed	As needed	–
Supplemental Upland Planting/Seeding	At end of PEP	Fall/Winter	Fall/Winter	–	–	–
Vernal Pool Seeding	Winter	Winter	Winter	Winter	–	–
Trash Removal	As needed	As needed	As needed	As needed	As needed	As needed
Barrier/Sign Maintenance	As needed	As needed	As needed	As needed	As needed	As needed
Footpath Decompaction/ Hydroseeding	--	–	–	–	–	End of project

[1]Minimum frequency

5.0 Maintenance Plan

Regular maintenance of the mitigation site will be required during the five-year maintenance and monitoring period to establish native container plants and control aggressive non-native weeds in the vernal pools and adjacent upland watershed habitats. The need for weeding is expected to decrease substantially by the end of the monitoring period provided successful habitat restoration has been achieved. Weeding activities will include herbicide application within the associated uplands. Herbicide has been used to control weeds safely and successfully in the vernal pool restoration programs on Otay Mesa and elsewhere. In these projects the success criteria for listed fairy shrimp have been met or exceeded with no negative effects on fairy shrimp noted. Maintenance activities will also include watering of planted container stock, hand weeding of the vernal pool basins, replanting and reseeding of native species, repair of fencing and signage, and trash removal. Maintenance activities will be performed per the schedule in Table 7.

5.1 Weed Control

Weed control will be performed consistent with the following:

- All weeding will be done by hand within and immediately adjacent to the preserved and newly established vernal pools. Use of herbicides within and immediately adjacent to restored pools will only be used under conditions approved by USFWS, RWQCB, and the City.

- All herbicide and pesticide use will be under the direction of a licensed qualified applicator and will be applied by personnel trained to apply herbicide. All weeding personnel will be educated to distinguish between native and non-native species to ensure that local native plants are not inadvertently killed.

- Herbicides will be applied on all areas that have been dethatched and at least three feet from the edge of the pools. Herbicide will only be applied when wind speed is less than five miles per hour, and spray nozzles will be of a design to maximize the size of droplets, to reduce the potential for drift of herbicide to non-target plants. Application of herbicide will not occur if rain is projected within 24 hours of the scheduled application.

- Weeding of the uplands will be done at a frequency and duration to ensure that weeds are not allowed to flower and set seed within the site. During the growing season this may be as frequently as weekly, depending on weather patterns. Any weeds that have set seed will be removed by hand and disposed of off-site.

- When vernal pools are ponding or close to saturation, weeds germinating along the basin edge will be cut using line trimmers by specially trained field personnel to ensure that germinating native species are not harmed. Cut material will be lightly raked away from the pools and care will be taken to not disturb the soil with raking activities.

- Herbicide treatment will be avoided within a 10-foot buffer from any concentrations of sensitive plant species.

5.2 Watering

Watering will be performed consistent with the following:

- Irrigation system operation or hand watering of container plants will be done in a manner to mimic natural rainfall, at a frequency and duration to encourage deep root establishment, but not enough to create runoff into the vernal pool basins.

- Irrigation system operation or hand watering will be carefully tapered off during the summer months to allow plants to experience their typical summer dormancy and avoid potential root rot or excessive soil shrinking and swelling that can damage plant roots.

5.3 Supplemental Planting and Seeding

Remedial planting and seeding of the MSS uplands and remedial seeding of the vernal pool basins will be performed consistent with the following:

- Container plants will be replaced, as needed, within the upland watersheds. All dead plants will be replaced during years 1 and 2 after initial plant installation, unless their function has been replaced by natural recruitment.

- Areas of the site where native plants and seed struggle to recruit will be remedially seed during Years 1 and 2.

- Remedial seeding will be conducted to increase vegetative cover and native species richness.

- Vernal pool basins that do not support their target vegetation (see Table 2) are not demonstrating the desired vernal pool endemic coverage, or are not meeting native richness performance standards will be remedially seeded.

- Hand seeding of the vernal pool basins will be conducted in the winter, after the pools begin to pond after the start of the wet season.

5.4 Trash Removal and Barrier/Sign Maintenance

Trash removal and barrier/sign maintenance will be performed consistent with the following:

- Trash in the mitigation areas will be removed as necessary.

- All fencing and signs will be checked and repaired as necessary.

- Other site problems, such as vehicle damage and erosion, will be reported to the City or other adjacent landowners with recommendations for remedial measures.

5.5 Footpath Decompaction and Hydroseeding

Footpath decompaction and hydroseeding will be performed consistent with the following:

- At the completion of the five-year maintenance and monitoring period and prior to final sign-off, foot paths and access routes that may have developed within the site as a result of maintenance and monitoring activities will be lightly decompacted by hand tools or heavy equipment and hydroseeded with the species and quantities shown in Table 7. Any footpath areas that have developed soil crusts will not be decompacted, and seed will only be applied in these areas by hand.

5.6 Maintenance Monitoring

Qualitative monitoring of the mitigation site to guide maintenance activities will be performed consistent with the following:

- After completion of the PEP, mitigation areas will be qualitatively monitored once a week by the vernal pool restoration specialist for the first two months, once every other week for the next four months, and monthly thereafter during the growing season. Monitoring will include, but not be limited to, assessment of container plant health, native seed germination, weed presence, and unauthorized trespassing. Monitoring results will be used to determine the timing and frequency of maintenance activities.

5.7 Adaptive Management Approach

An adaptive management approach will be implemented for the mitigation site in the event that areas of the site are not attaining the desired habitat values and functions. Adaptive management is defined, for the purposes of this project, as a flexible, iterative approach to the long-term management of biological resources that is directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that are producing adverse results within the mitigation site. Effects of any catastrophic events that affect the mitigation will receive prompt and appropriate corrective actions.

Adaptive management measures to be implemented will include the utilization of qualitative data gathered in the field throughout the five-year maintenance and monitoring period to assess the health and vigor of newly established vernal pools and restored upland watershed habitat within the mitigation sites. Following an event that causes damage to all or part of the mitigation sites, this data will be used in part to drive management considerations for the repair of the damaged areas. Achieving the key goals of the mitigation program and establishing self-sustaining native habitats will be the focus of all adaptive management decisions. Adaptive measures may include collection and dispersal of vernal pool plant seed, recontouring of vernal pool basins, reintroduction of additional soil inoculum, upland replanting or reseeding, additional weed control efforts, and others deemed appropriate through consultation with the City and wildlife agencies.

If an interim performance standard is not met for any of the restored/enhanced vernal pools or restored upland MSS habitat in any year or if the final performance standards are not met, the project proponent will prepare an analysis of the cause(s) of failure and, if deemed necessary by wildlife agencies and the City, propose remedial actions for approval. If any of the established/enhanced vernal pools or restored upland watershed habitat has not met a performance standard during the initial five-year period, the maintenance and monitoring obligations will continue until the above agencies deem the mitigation successful, or contingency measures are implemented. Mitigation will not be deemed successful until at least two years after any contingency measures are implemented, as determined by the wildlife agencies and the City.

6.0 Performance Standards

The performance standards used to determine successful vernal pool mitigation include the achievement of standards for CRAM, hydrologic regime; vernal pool vegetation cover, plant species richness, and weed tolerance; and species-specific standards for fairy shrimp. Standards for hydrologic regime, vernal pool vegetation cover, plant species richness, weed tolerance, and fairy shrimp will be compared to the same values taken from a reference site.

A reference site will be used to define the target vegetation and establish target values for cover, species richness, wildlife usage, and weed abundance for the vernal pool and upland MSS restoration areas.

Each of the specified performance standards will be evaluated following the completion of seasonal field monitoring to determine if the final performance standards have been met and to assess the likelihood that any particular standard will be met (taking into account the seasonal conditions). The final assessment of success will be based on the combined performance over the monitoring period and an analysis of the trends established.

6.1 Location of Reference Site

The City-owned Cal Terraces vernal pool complex on Otay Mesa supports high-quality vernal pools surrounded by established upland MSS habitat. Cal Terraces is located within two miles northwest of the mitigation site and will serve as the reference site for this project (see Figure 4). Representative, high-quality reference vernal pools will be chosen from within Cal Terraces. The most functional vernal pools will be chosen at the time of the analysis to include the ranges of both physical and biotic characteristics that meet the performance standards. All reference vernal pools will support vernal pool vegetation, as defined below in the target vegetation and cover criteria. Any vernal pools to be used as reference pools for this mitigation project must be approved by the City. Cal Terraces will also serve as the reference site for the MSS habitat for the watershed restoration. Most vernal pool complexes on Otay Mesa are either restored vernal pools or severely degraded and while Cal Terraces is a restoration site itself, the site achieved all success criteria and was signed off by regulatory agencies in 2003. The site has remained high-quality vernal pool and MSS habitat for 17 years. Cal Terraces represents one of the older restoration sites and provides a high-quality example of what restoration sites should look like upon completion.

The VPHCP requires that vernal pool mitigation projects utilize reference pools from each of the three VPHCP subareas, however, due to the unique nature of Otay Mesa pools (endemic vernal pool plant species, clay pan substrate), one reference site located on Otay Mesa will be utilized for this project. Multiple vernal pools from the Cal Terrace reference site will be used to provide a variety of conditions for comparison to the restored pools.

6.2 California Rapid Assessment Methodology–Vernal Pools

CRAM is a wetland assessment method that combines landscape, hydrological, physical, and biological structure attributes, further separated into metrics and submetrics, into an index value. These indexed values (A=12, B=9, C=6, D=3) are repeatable, are scientifically defensible, and offer a window into overall wetland functionality (California Wetlands Monitoring Workgroup 2019).

CRAM will be used as an additional monitoring method to demonstrate mitigation site improvement and provide a more overall view of the mitigation system as whole. CRAM will not be used in lieu of quantitative monitoring efforts but in combination to demonstrate the functionality of the vernal pool systems within the mitigation site.

A vernal pool CRAM assessment was conducted for the mitigation site on May 3, 2019, and will be used to determine baseline conditions. The site was separated into two assessment areas and the average results of the assessments are shown in Table 8.

Table 8
CRAM Metric Goals for Five Years
Post-Establishment of Vernal Pools

CRAM Attribute	CRAM Metric and Submetrics	Average Current Score	Target CRAM Metric Goal
Buffer and Landscape Context	Aquatic Area Abundance	B	B
	Percent of AA with Buffer	A	B
	Average Buffer Width	A	B
	Buffer Condition	C	C
Hydrology	Water Source	A	A
	Hydroperiod	A	A
	Hydrologic Connectivity	A	B
Physical Structure	Structural Patch Richness	D	B
	Pool and Swale Density	D	C
	Topographic Complexity	D	B
Biological Structure	Horizontal Interspersion and Zonation	D	B
	A. Number of Codominant Species	D	B
	B. Percent Non-native	C	A
	C. Endemic Species Richness	D	C

In general, buffer and landscape context and hydrology attributes are expected to stay the same even after restoration activities are completed. CRAM metric and submetric scores for physical and biological are expected to change from the baseline as a result of both vernal pool restoration and completion of adjacent residential development. CRAM scores for physical structure and biological structure may be expected to increase, although buffer and landscape context scores may be expected to decrease as a result of the adjacent development. The goals for each metric are shown in Table 8; however, attainment of these goals will not confirm site success, nor should inability to achieve these goals determine site failure. Rather, the measurement of these metrics will add to the qualitative discussion of the progress of the mitigation site.

CRAM assessments will use the Vernal Pool Module (version 6.1 or most recent) and be conducted a total of two times during the five-year maintenance and monitoring period to inform adaptive management: Year 0 (post-implementation) and Year 5 (prior to sign-off).

Although no official success standards will be applied to this project, CRAM scores will be used to evaluate form and function of the vernal pool mitigation site and therefore general achievement of non-wetland waters mitigation requirement of the project. When compared to the as-built condition, the results of the Year 5 CRAM surveys should show, at a minimum, the following:

- Physical form and structure suitable for ponding and hydrologic connectivity
- Development of hydrologic features within the system that provide evidence of expected function
- Continued improvement in biotic structure
- Overall trajectory toward improved rather than degraded condition

These attributes assess the areas adjacent to the assessment area and, therefore, are mostly outside the mitigation site and not within the control of this mitigation program.

The improvement of the physical structure and biological structure of the mitigation site will be the primary focus of mitigation as these attributes focus on the topography and biology within the assessment area, which is well within the control of this mitigation program.

6.3 Vernal Pool Hydrological Regime Performance Standards

The depth and duration of water in restored/enhanced vernal pools is highly dependent upon the magnitude and number of storm events, the time interval between each event, and the climactic determinants of evaporation and transpiration (temperature, humidity, sunlight, and winds) between each storm event in a given year. Annual rainfall in the region is remarkably variable. Therefore, the performance standards for hydrological characteristics depend on a comparison with control habitats representing the expression of performance standards during each monitoring year. In general, newly restored vernal pools pond earlier and longer than older, more established pools, and this variation should be taken into consideration when discussing the success of the restored/enhanced pools.

- The duration, periodicity, and depth of inundation for the restored/enhanced vernal pools will be considered successful if, prior to the end of the monitoring period, the vernal pools demonstrate hydrological patterns of duration, periodicity, and depth of inundation that fall within the range of the highest-functioning reference vernal pool.

- Total area of inundation of the restored/enhanced vernal pools must be equal to or greater than the area proposed in the mitigation plan 0.806 (35,128 square feet) during an average or above rainfall year.
- Each restored/enhanced vernal pool must be inundated, during an average or above rainfall year, for a duration and depth that supports vernal pool flora and fauna.
- Each restored/enhanced vernal pool must be inundated for a duration and depth that is within range of inundation for the reference vernal pools.
- The average depth and duration of inundation of the restored/enhanced pools must be within one standard deviation of the average depth and duration of the reference pools.

6.4 Vernal Pool Vegetation Performance Standards

The restored/enhanced vernal pools will be subject to the vegetation performance standards listed below. The upland watershed is restored to MSS and will be subject to the performance standards listed in Section 6.6.

Desired absolute vernal pool vegetation goals are shown in Table 9 and serve as a guide for monitoring annual changes and determining needs for adaptive management; however, the performance standards included in 6.4.1 through 6.4.3 will be utilized to determine ultimate project success and whether the site meets the objectives identified in the Site Specific Objectives of the VPMMP (City of San Diego 2017b).

6.4.1 Endemic Vernal Pool Plant Species Richness Performance Standards

The restored/enhanced vernal pools will support reproducing populations of a minimum number of endemic vernal pool plant species (see CRAM Vernal Pool modules) equivalent to that supported by the reference vernal pools (see Table 9). Equivalence is met when (1) the endemic vernal pool species richness (i.e., number of native vernal pool species) value for each of the restored/enhanced vernal pools is equal to or greater than the minimum value found in the reference vernal pools and (2) the average value of vernal pool species richness in the restored/enhanced vernal pools is equal to or greater than that of the average of the reference vernal pools.

Table 9 Vernal Pool Vegetation Performance Standards				
Year	Native Species Richness	Endemic Vernal Pool Species Cover (%)	VPHCP Cover Species Presence (# of pools)	Non-native Cover (%)
1	2	5	• ERYARI – 4 • NAVFOS – 5 • ORCCAL – 2 • POGNUD – 10	• <5 • 0 Cal-IPC high or perennial species
2	3	10	• ERYARI – 8 • NAVFOS – 10 • ORCCAL – 4 • POGNUD – 15	• <5 • 0 Cal-IPC high or perennial species
3	4	20	• ERYARI – 11 • NAVFOS – 12 • ORCCAL – 6 • POGNUD – 20	• <5 • 0 Cal-IPC high or perennial species
4	5	30	• ERYARI – 12 • NAVFOS – 13 • ORCCAL – 8 • POGNUD – 25	• <5 • 0 Cal-IPC high or perennial species
5	6	40	• ERYARI – 20 • NAVFOS – 15 • ORCCAL – 10 • POGNUD – 30	• <5 • 0 Cal-IPC high or perennial species

Cal-IPC = California Invasive Plant Council
ERYARI = San Diego button-celery (*Eryngium aristulatum* var. *aristulatum)*
NAVFOS = spreading navarretia (*Navarretia fossalis)*
ORCCAL = California Orcutt's grass (*Orcuttia californica)*
POGNUD = Otay Mesa mint (*Pogogyne nudiuscula)*

6.4.2 Endemic Vernal Pool Vegetation Cover Performance Standards

For the restored/enhanced vernal pools the performance standards are as follows:

- The vernal pool endemic plant species cover of all restored/enhanced pools on average must be at least 70 percent of the average for the reference pools.
- For each of the restored/enhanced pools, the absolute vernal pool endemic species cover must be at least 50 percent of the average absolute cover of vernal pool endemic species for the reference pools.
- Vernal pool endemic species cover for each restored/enhanced vernal pool must increase in each successive year based on initial quantitative monitoring, except in years of extreme drought.

6.4.3 Vernal Pool Non-native Cover Performance Standards

The non-native cover performance standards are as follows:

- Within all of the vernal pools in the mitigation site (restored/enhanced), Cal-IPC List High or perennial weed species will not be present, and the relative cover of all other non-native species will not exceed five percent.

- The average absolute cover of non-native species in the restored/enhanced vernal pools must be less than the average absolute cover of non-native species of the reference pools.

6.5 Fairy Shrimp Performance Standards

The restored/enhanced vernal pools will support reproducing populations of Riverside and San Diego fairy shrimp (i.e., gravid females). Re-establishment of San Diego fairy shrimp is not a requirement of this project as they are adequately conserved under the VPHCP (City of San Diego 2017a); therefore, presence of San Diego fairy shrimp on-site is desirable and will be measured, but it is not required for project success. Success for fairy shrimp reintroduction will be determined by measuring the ponding of water, presence of viable eggs, hatched fairy shrimp, and gravid females within the restored/enhanced vernal pools as outlined below:

- The restored/enhanced vernal pools will pond for a period of time similarly to reference vernal pools during an average rainfall year and at an appropriate depth and quality to support San Diego and/or Riverside fairy shrimp.

- Protocol wet season sampling will be taken annually in the restored/enhanced vernal pools to determine presence and approximate quantities of hatched fairy shrimp and gravid females, by species (USFWS 1996).

- At the end of the monitoring period, Riverside fairy shrimp presence will be confirmed in 25 percent of the pools on-site.

- At the end of the monitoring period, San Diego fairy shrimp presence will be confirmed in 33 percent of the pools on-site.

6.6 Maritime Succulent Scrub Vegetation Performance Standards

The performance standards for the upland MSS areas will be based on a reference site that supports vernal pools and the upland habitat targeted for restoration in this mitigation plan. While achieving a fully mature system within five years may not be possible, the site should demonstrate that it is exhibiting a positive trajectory towards long-term viability.

The City-owned Cal Terraces vernal pool complex has been identified as the reference site for this mitigation site. The reference site will be used to establish target values for vegetation cover, species richness (number of different species present), wildlife usage, and weed abundance. Target values will be relative to the reference site where quantities observed for the mitigation site will be divided by those same values observed at the reference site to determine how the mitigation site is performing relative to the reference site. Yearly target values for the performance standards cover and species richness of MSS habitat are presented in Table 10.

Table 10
Maritime Succulent Scrub Performance Standards as a Relative Percentage of Reference Site Values

Year	Percent Cover–Native Shrub Species	Percent Cover–Native Herbaceous Species	Species Richness
1	10	5	30
2	20	10	40
3	30	20	50
4	50	40	60
5	70	60	85

6.6.1 Plant Survivorship, Vegetation Cover, and Species Richness Performance Standards

In combination with the performance standards included in Table 10, the standards listed below will also be evaluated annually and applied to the mitigation site. The plant survivorship, vegetation cover, and species richness performance standards are as follows:

- Container plant survival will be 80 percent of the initial plantings for Years 1 through 5. After Years 1 and 2, all dead plants will be replaced unless their function has been replaced by natural recruitment.

- At the end of the five-year maintenance and monitoring program, the upland habitat relative percent cover values will be 70 percent of the reference site for shrub cover and 60 percent of the reference site for herbaceous cover.

- At the end of the five-year maintenance and monitoring period, 85 percent of the upland plant taxa are shared with the reference site.

6.6.2 Non-native Weed Cover Performance Standards

The relative cover of all non-native species within the upland MSS will not exceed an absolute value of 10 percent and no Cal-IPC List High or perennial species will be present at the end of the five-year maintenance and monitoring period.

6.7 Photographic Documentation

Permanent photopoints will be located at each restored/enhanced vernal pool and at locations within the upland MSS. Representative photographs will be taken at each photopoint to visually document the progress of vegetation cover development over the monitoring period.

7.0 Monitoring Requirements

A minimum commitment of five years of monitoring of the vernal pool and upland MSS restoration areas will be completed. In addition to the qualitative monitoring discussed in Section 5.6, biological monitoring for performance standards will include quantitative hydrology monitoring, quantitative vegetation monitoring, USFWS protocol surveys (wet season), complete flora and fauna inventories, and photographic documentation. To minimize impacts to the soil surface of any vernal pools during restoration and monitoring activities, cobbles will be oriented within the restored vernal pools to serve as stepping stones. The monitoring schedule is presented in Table 11.

7.1 Vernal Pool Hydrology Monitoring

The success criteria for hydrological characteristics will be based on comparing performance measurements for the restored/enhanced vernal pools with those for reference vernal pools during each monitoring year. Hydrological characteristics to be monitored include depth, periodicity, and duration of inundation in both the restored/enhanced and reference pools. Precipitation will be based on records from the nearest reporting weather station. Field methods for the quantitative hydrological monitoring are described below.

- The restored vernal pools will be topographically mapped at 0.2-foot contour intervals.

- The water depth for restored vernal pools and reference pools will be measured every two weeks after initial ponding between November 1 and May 15 or until the standing water is gone. Water depth will be measured using a ruler placed in the low point of each pool.

- A water depth versus time chart will be prepared illustrating water depth at the deepest point and ponding periodicity of each restored/enhanced vernal pool and reference pool.

- Water measurements will also be taken annually in the restored/enhanced pools and reference pools to determine water quality (e.g., pH, temperature, total dissolved solids, salinity) of ponding.

Table 11
Vernal Pool and Maritime Succulent Scrub Monitoring Schedule

Task	120-day PEP	Year 1	Year 2	Year 3	Year 4	Year 5
Qualitative Monitoring	Weekly	Every other week during growing season	Every other week during the growing season	Monthly during the growing season	Bi-monthly during the growing season	Bi-monthly during the growing season
Hydrology Monitoring	Every two weeks after initial ponding	Every two weeks after initial ponding	Every two weeks after initial ponding	Every two weeks after initial ponding	Every two weeks after initial ponding	Every two weeks after initial ponding
Vernal Pool Plant (quantitative)	None[1,2]	March (aquatic phase) and May (dry phase)[2]	March (aquatic phase) and May (dry phase)[2]	March (aquatic phase) and May (dry phase)[2]	March (aquatic phase) and May (dry phase)[2]	March (aquatic phase) and May (dry phase)[2]
Fairy Shrimp (wet season)	Protocol survey[2]	Protocol survey[2]	Protocol survey[2]	Protocol survey[2]	Protocol survey[2]	Protocol survey[2]
Photograph Documentation	Monthly	As-needed	Spring	Spring	Spring	Spring
Maritime Succulent Scrub Vegetation Monitoring (quantitative)	None[1]	Spring	Spring	Spring	Spring	Spring

[1]Quantitative monitoring to begin in Year 1.
[2]Time dependent on rainfall.

7.2 Vernal Pool Vegetation Monitoring

Monitoring tasks for vernal pool vegetation are as follows:

- The restored/enhanced vernal pools and reference pools will be sampled for plant species presence and estimated cover using a meander survey of at least a 15-minute duration per basin during the aquatic phase (e.g., March, dependent on weather patterns) and within 30 days of the disappearance of standing water (e.g., May, dependent on weather patterns). All species present will be noted and their cover estimated.

- The restored/enhanced vernal pools will be photographed from an established photopoint during the vegetation sampling period.

7.3 Vernal Pool Invertebrate Monitoring

Monitoring tasks for vernal pool invertebrates are as follows:

- Annually, the created/enhanced vernal pools will be sampled for aquatic invertebrates using pole-mounted dip-nets of appropriate mesh size to capture cladocerans, ostracods, branchiopods, and tadpoles following USFWS protocol survey methods (1996). The presence of hatched fairy shrimp and gravid females by species will be recorded.

7.4 Maritime Succulent Scrub Monitoring

It is anticipated that the MSS habitat will become established within the five-year maintenance and monitoring period, although full maturation of the community may take longer. Overall native cover (i.e., shrubs, herbaceous species) and species richness will be evaluated for these areas as well as for the reference site.

The native vegetation cover will be measured quantitatively using line-intercept sampling method in the spring, beginning in Year 2. This method involves the establishment of randomly placed transects, usually 10 meters long, to gather data to estimate native vegetation cover (i.e., shrub and herbaceous). Approximately two 10-meter transects will be sampled per acre. Species richness will be determined by lists of all plant species present within the restoration areas.

7.4.1 Invasive Non-native Plants

The presence of invasive non-native plant species will be monitored in the restored MSS areas. Information collected during monitoring visits will be used to schedule the maintenance crews to conduct maintenance activities.

7.4.2 Wildlife Usage

A list of wildlife species observed using the mitigation site will be prepared and included in the annual reports. Species lists for both restored/enhanced vernal pools and the MSS areas will be compiled annually.

7.5 Reporting

Annual reports that assess both the attainment of yearly interim and progress toward the final performance standards for the restored/enhanced vernal pools and restored upland MSS will be submitted to the City by December 1 of each year. The City will be responsible for submitting these reports to the appropriate wildlife agencies. The reports will also summarize the project's compliance with all applicable mitigation measures and permit conditions. A final monitoring report will be prepared and submitted to the City for use in the notification of completion and final acceptance of the mitigation effort.

8.0 Long-term Management

The mitigation site is within the City MSCP's Multi-Habitat Planning Area and the vernal pool complex is a VPHCP preserve area. After the successful restoration of the vernal pool basins and associated uplands, the vernal pool complex will be managed pursuant to the guidelines of the VPHCP and VPMMP (City of San Diego 2017a, 2017b).

The VPHCP provides the requirements of the long-term management of vernal pool complex K 13 N, including mitigation site. Management activities identified for J 13 N include a combination of habitat restoration and stewardship. These are identified as Level 3 and Level 1 management, respectively, in the VPHCP.

This mitigation plan is intended to address the Level 3 management (habitat restoration). As described in the VPHCP, the goal of this management level is to increase the populations of covered species, namely Otay mesa mint, spreading navarretia, San Diego button-celery, California Orcutt grass, Riverside fairy shrimp, and San Diego fairy shrimp.

Following successful completion of restoration, the mitigation site will be subject to stewardship management in perpetuity by the City of San Diego Park and Recreation Department Open Space Division. Stewardship activities identified in the VPHCP for the mitigation site are intended to maintain habitat conditions and covered species populations within the vernal pool complex. Management activities will include annual (or more frequent) trash and debris removal; fence and signage maintenance; monitoring and adaptive measures for edge effects; fire suppression and fire damage repair; access patrol, enforcement, and trespass damage repair; monitoring and repair of topographic damage; and weed control within and around the vernal pools.

9.0 Notification of Completion

If the final success criteria have been met at the end of the five-year maintenance and monitoring program, notification of these events will be provided with the Year 5 report. If the final success criteria have not been met by the end of the five-year maintenance and monitoring program, the Year 5 report will discuss the possible reasons and recommendations for remedial measures to cause the site to meet the criteria. If any of the established/enhanced/restored vernal pools or upland watershed habitats have not met the performance standards, the project proponent's maintenance and monitoring obligations will continue, until the wildlife agencies and City deem the mitigation program as successful or contingency measures must be implemented (see Section 8, Adaptive Management Plan).

Following receipt of the final annual report, the wildlife agencies and the City will be invited to visit the restoration site to confirm completion of the mitigation effort. The mitigation requirements will be deemed complete once the final success criteria are met and after written approval by the wildlife agencies and the City has been received.

10.0 References Cited

Allen, M. F.
1988 Below Ground Structure: A Key to Reconstructing a Productive Arid Ecosystem. In *The Reconstruction of Disturbed Lands: An Ecological Approach,* edited by E.B. Allen. Westview Press, Boulder, CO.

Bauder, E. T., and S. C. McMillan
1998 Current Distribution and Historical Extent of Vernal Pools in Southern California and Northern Baja California, Mexico.

California Wetlands Monitoring Workgroup
2019 EcoAtlas. https://www.ecoatlas.org.

RECON Environmental, Inc.
2020 Biological Technical Report for the La Media Road Improvement Project. May 8.

Rick Engineering Company
2019 Hydrology Study for Vernal Pools at La Media Road Widening & Fire Rescue Air Operation Phase II Project. November 15.

San Diego, City of
1997 City of San Diego MSCP Subarea Plan. March.

2017a Final City of San Diego Vernal Pool Habitat Conservation Plan. October.

2017b Final City of San Diego Vernal Pool Habitat Conservation Plan – Vernal Pool Management and Monitoring Plan. October.

2020 Biological Resources Report for the Montgomery-Gibbs Executive Airport: Fire-Rescue Air Operations Facility Project – Phase II. May 20.

Scheidlinger, C., C. Patterson, and P. Zedler

1985 Recovery of Vernal Pools and Their Associated Plant Communities Following Disturbance: Miramar, San Diego County, CA. U.S. Environmental Protection Agency.

U.S. Department of Agriculture

1973 *Soil Survey, San Diego Area, California.* Edited by Roy H. Bowman. Soil Conservation Service and Forest Service. December.

U.S. Fish and Wildlife Service (USFWS)

1996 Interim Survey Guidelines to Permittees Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods.

1998 Recovery Plan for Vernal Pools of Southern California.

APPENDIX E
Noise Analysis

This page intentionally left blank

Noise Analysis for Phase II of the San Diego Fire-Rescue Air Operations Hangar Project, Montgomery-Gibbs Executive Airport, San Diego, California

Prepared for
City of San Diego
Real Estate Assets
Airports Division
3750 John J. Montgomery Drive, MS 14
San Diego, CA 92123

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

RECON Number 9078
February 16, 2023

Jessica Fleming

Jessica Fleming,
Senior Environmental Specialist,
Noise, Air Quality, and GHG

TABLE OF CONTENTS

FIGURES

TABLE OF CONTENTS (cont.)

TABLES

ATTACHMENT

Acronyms and Abbreviations

AEDT	Aviation Environmental Design Tool
AEM	Area Equivalent Method
AirOps	Air Operations
ALUCP	Airport Land Use Compatibility Plan
CFR	Code of Federal Regulations
City	City of San Diego
CNEL	community noise equivalent level
dB	decibel
dB(A)	A-weighted decibel
DNL	day//night average sound level
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
HVAC	heating, ventilation, and air conditioning
L_{eq}	one-hour equivalent noise level
$L_{eq(12)}$	12-hour equivalent noise level
L_{pw}	sound power level
NLR	noise level reduction
project	San Diego Fire-Rescue Air Operations Hangar Project
SDFR	San Diego Fire-Rescue
SEL	sound exposure level

Executive Summary

This report evaluates potential noise impacts associated with the proposed San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (project) located in the northeastern corner of the Montgomery-Gibbs Executive Airport in the city of San Diego. The project area consists of a 6.5-acre site located adjacent to the Air Traffic Control Tower between the Federal Aviation Administration (FAA) lease area, the Runway Object Free Area, and the Runway Protection Zone for the northwest approach to Runway 5/23. The project would design and construct permanent helicopter hangars and support facilities.

Montgomery-Gibbs Executive Airport has been operating as public-use airport since the City of San Diego (City) purchased Gibbs Field in 1947. The project would construct hangar buildings and concrete apron space to accommodate the current and future needs of the AirOps fleet. The project would allow for the addition of two helicopters to the existing SDFR fleet.

The sensitive receptors located closest to the construction area would be the residential uses located north of Tech Way, more than 2,000 feet from the construction area. Given the short-term duration of construction activities as well as the distance between the project site and the nearest sensitive receptor, the project would not result in substantial increases in ambient noise levels during project construction. In addition to the compatibility of project construction with the nearest sensitive receptors, the potential for noise to impact adjacent receivers from future helicopter activity was assessed in accordance with FAA Order 1050.1F.

Construction Noise

Noise associated with the site preparation and utilities, building, and paving for the project would potentially result in short-term impacts to surrounding properties. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist about one mile southwest of Runway 5 (part of the Clairemont Mesa Community Plan), south of the airport property (part of the Serra Mesa Community Plan), and less than two miles west of the departure end of Runway 28R (part of the Kearny Mesa, Clairemont and Tierrasanta Community Plans). Construction noise levels due to site preparation and utilities, building, and paving activities were calculated at the airport boundary and at the nearest residential use located north of Tech Way. As calculated in this analysis, construction noise levels are not anticipated to exceed 75 A-weighted decibels one-hour equivalent noise level at any of the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that may be heard above ambient conditions, the exposure would be temporary. As construction activities associated with the project would comply with noise level limits from Noise Abatement and Control Ordinance Section 59.5.0404.

Aircraft Noise

SDFR currently operates three helicopters from Montgomery-Gibbs Executive Airport consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk helicopter. By the first operational year, an additional Lockheed Martin/SikorskyS70i Firehawk helicopter would be included in the fleet. The final Bell 412 helicopter would be added to the fleet five years after the first operational year.

Noise and land use compatibility standards are established in 14 Code of Federal Regulations Part 150, Airport Noise Planning, Land Use Compatibility Guidelines, the Montgomery Field Airport Land Use Compatibility Plan, and the City's General Plan. As demonstrated in this analysis, the project would not result in a measurable increase in operational noise levels. Noise level increases would be less than the 1 decibel screening threshold. Therefore, aircraft noise screening rules out the need for more detailed noise analysis.

1.0 Introduction

1.1 Project Description

Phase II of the San Diego Fire-Rescue (SDFR) Air Operations (AirOps) Hangar Project (project) would construct permanent helicopter hangars and support facilities at Montgomery-Gibbs Executive Airport. The project would support Phase I of the AirOps Facility Project that was completed in November 2019. Phase I consisted of interior remodeling and tenant improvements of the existing AirOps building. AirOps is a 24 hours a day, 365 days a year operating facility with no current hangar space at Montgomery-Gibbs Executive Airport to support these operations. A feasibility study concluded that 30,000 square feet of hangar space are required to meet future needs of the AirOps fleet. Phase II would add helicopter hangars and support facilities to make the AirOps building improved under Phase I a fully operational fleet center for SDFR's helicopters and rapid fire response. The proposed construction would occur in the northeastern corner of the Montgomery-Gibbs Executive Airport in the city of San Diego, California. The area of temporary and permanent disturbance would consist of a 3.72-acre site east of Taxiway Charlie and the Taxiway Safety Area, located adjacent to the Air Traffic Control Tower between the Federal Aviation Administration (FAA) lease area, the Runway Object Free Area, and the Runway Protection Zone for the northwest approach to Runway 5/23. Project construction would be limited to the 3.72-acre project footprint to avoid impacts to additional natural areas and avoid interference with runway operations. Consequently, the Proposed Action would not have a pre-defined temporary staging area, but would utilize various staging areas during the phased construction process in order to limit construction activities to the 3.72-acre project footprint. Entry to the project area would be provided via an asphalt road accessed from a security gate located off Ponderosa Avenue. Regional and Airport Boundary maps are provided in Figures 1 and 2, respectively. Figure 3 shows the project footprint.

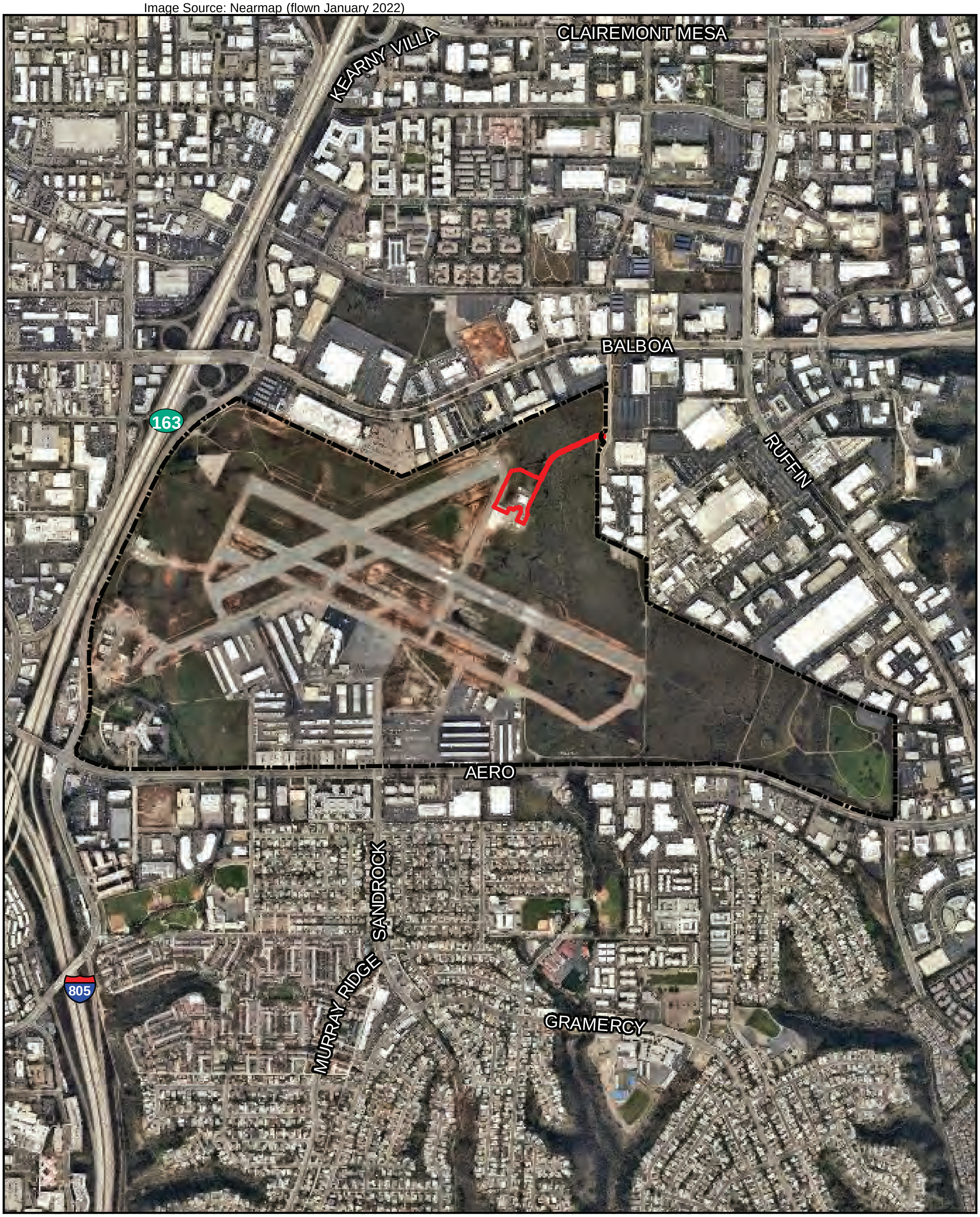
Project Location

FIGURE 1
Regional Location

RECON

M:\JOBS5\9078\common_gis\fig1_nos.mxd 2/16/2023 fmm

Image Source: Nearmap (flown January 2022)



0 Feet 1,500

Project Boundary

Airport Boundary

RECON

FIGURE 2

Airport Boundary

M:\JOBS5\9078\common_gis\fig2_nos.mxd 2/16/2023 fmm

Image Source: Nearmap (flown January 2023)

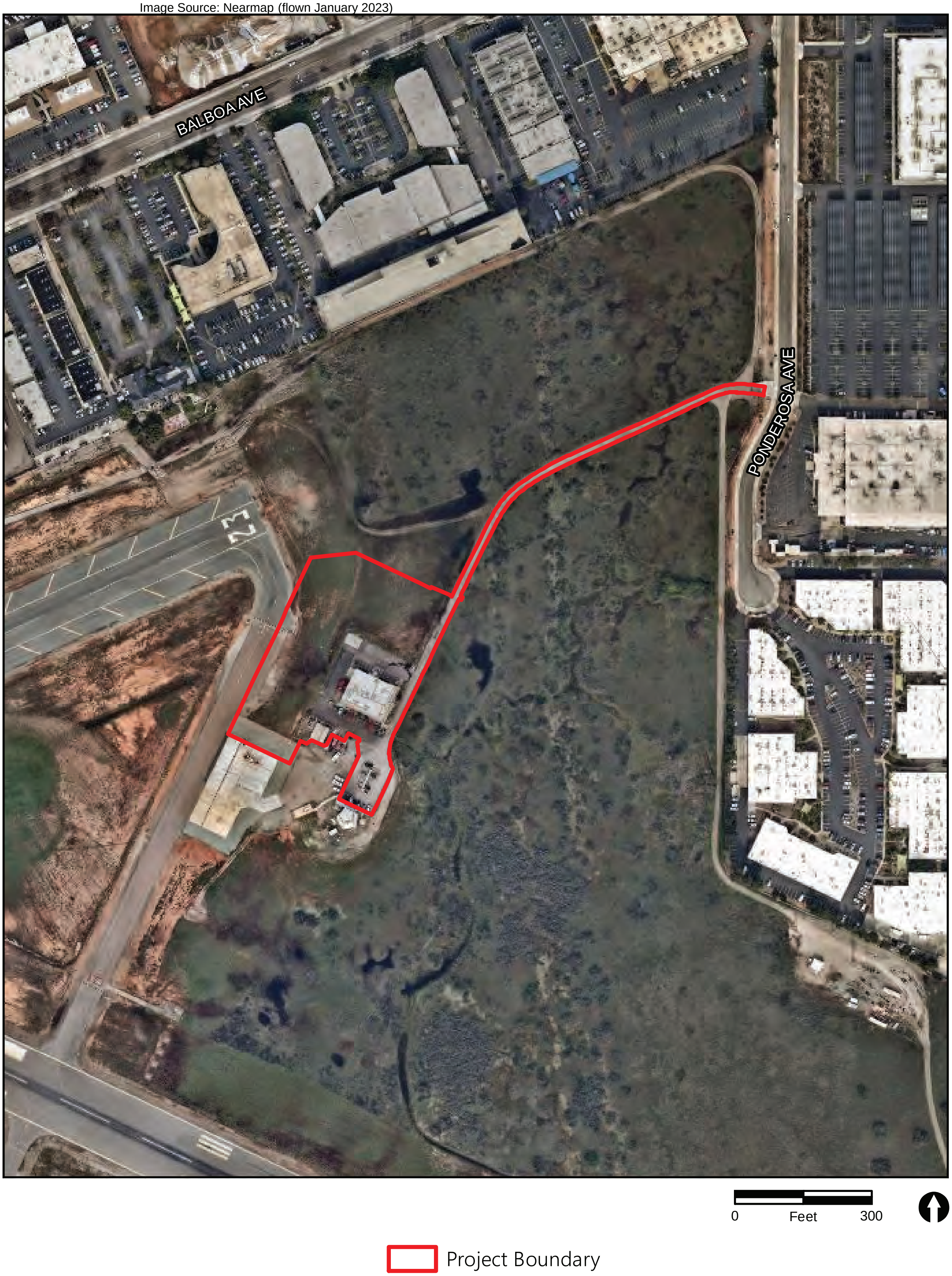


FIGURE 3

Project Location on Aerial Photograph

RECON

M:\JOBS5\9078\common_gis\fig3_nos.mxd 2/16/2023 fmm

The project would include the following components:

- Construct approximately 32,000 square feet of prefabricated metal hangar that would contain a hangar support area for maintenance offices, over-haul, avionics, and storage rooms.

- Construct an approximately 65,000-square-foot concrete apron, to accommodate five helicopters.

- Construct parking and shelter for a single Heli-tender and two fueling tender vehicles.

- Relocate existing utility connections (sewer, stormwater, gas, water, power, etc.) within the main access roadway from Ponderosa Avenue. Relocations would consist of trenching within the existing main access roadway and repaved. All relocation activities would be confined to the existing main access roadway and would not affect natural soils surrounding the main access roadway.

- Repair and resurface the main access road from Ponderosa Avenue to the FAA Air Traffic Control Tower and new AirOps facility.

- Install storm water retention features that would capture runoff from the proposed improvements and an existing parking pad adjacent to the southern project boundary. The project would route all runoff from new impervious areas into a proposed permanent modular wetland for water quality and then into a proposed underground storage system for detention of the 100-year peak volumes. The modular wetland and underground storage system would be constructed as a part of the project. Captured peak runoff volumes from the six-hour, 100-year storm event would be pumped and hauled off for discharge into an acceptable Municipal Separate Storm Sewer System that meets the requirements of the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266.

SDFR currently operates three helicopters: two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk. The proposed hangars are intended to accommodate these three existing helicopters, as well as one additional Lockheed Martin/SikorskyS70i Firehawk and one additional Bell 412. The project is anticipated to be awarded as a design/build contract, with a 12-month design phase and a 14-month construction phase. Additionally, mitigation for project impacts on vernal pools is anticipated to begin at the City of San Diego’s (City's) vernal pool mitigation bank in calendar year 2022 and be completed in calendar year 2023.

In the future condition, the Bell 412 helicopters would take off and land from the existing concrete parking pad, while the Lockheed Martin/SikorskyS70i Firehawks would taxi from the proposed hangars along Taxiway Charlie to take off from Runway 5/23. The Lockheed Martin/SikorskyS70i Firehawks would also land at Runway 5/23 and taxi back to the proposed hangars along Taxiway Charlie.

1.2 Fundamentals of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a "sound power level" or a "sound pressure level," which while commonly confused are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw}, is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. For aviation noise analyses, the FAA has determined that the 24-hour cumulative exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The community noise equivalent level (CNEL) is the FAA-approved metric for the state of California. Both CNEL and day/night average sound level logarithmically average aircraft sound levels over a 24-hour period, with a 10 dB(A) penalty added to noise events between 10:00 p.m. and 7:00 a.m. However, CNEL also includes a 5 dB(A) penalty during the evening from 7:00 p.m. to 10:00 p.m.

Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation 2013).

2.0 Applicable Standards

2.1 Federal Regulations – FAA Order 1050.1F

Policies and procedures for evaluating the environmental impacts associated with airport development are described in FAA Order 1050.1F (FAA 2015). The noise analysis related policies and procedures are presented in Appendix B of the Order. These requirements are also included in the FAA 1050.1F Desk Reference (FAA 2020), which provides comprehensive guidance regarding the analysis of impacts in specific environmental impact categories.

Aircraft noise screening may rule out the need for more detailed noise analysis and provide documented support for a Categorical Exclusion if screening shows no potential for significant noise impacts. The FAA has multiple noise screening tools and methodologies. The Area Equivalent Method (AEM) can be used for "evaluating proposed actions and alternative(s) at an airport which result in a general overall increase in daily aircraft operations or the use of larger/noisier aircraft, as long as there are no changes in ground tracks, flight profiles or runway use. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. If the AEM calculations indicate an increase of 17 percent or more, or if the action is such that use of the AEM is not appropriate, then the noise analysis must be performed using the Aviation Environmental Design Tool (AEDT) to determine if significant noise impacts would result" (FAA 2020).

If a project does not screen out and a more detailed noise analysis is required, the determination of significance must be obtained through the use of modeled noise contours along with local land use information and general guidance contained in Appendix A of 14 Code of Federal Regulations (CFR) Part 150. As a means of implementing the Aviation Safety and Noise Abatement Act, the FAA adopted Regulations on Airport Noise Compatibility Planning Programs. These regulations are spelled out under 14 CFR Part 150 and include published noise and land use compatibility charts (Table 1) to be used for land use planning with respect to aircraft noise.

Compatible or non-compatible land use is determined by comparing the aircraft CNEL values at a site to the values in the Federal Aviation Regulations Part 150 land use compatibility guidelines. Per FAA standards, a significant noise impact would occur if the analysis shows that the proposed project would cause noise sensitive areas to experience an increase in noise of CNEL 1.5 dB or more at above CNEL 65 dB noise exposure when compared to the baseline condition. For example, an increase from 65.5 dB to 67 dB is considered a significant impact, as is an increase from 63.5 dB to 65 dB.

Table 1 Federal Aviation Regulation Part 150 Land Use Guidelines						
	Yearly Day-Night Average Noise Level (DNL)					
Land Use	<65	65–70	70–75	75–80	80–85	>85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock farming and breeding	Y	Y[6]	Y[7]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y[5]	Y[5]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Y (Yes)=Land Use and related structures compatible without restrictions.
N (No)=Land Use and related structures are not compatible and should be prohibited.
NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Table 1 Federal Aviation Regulation Part 150 Land Use Guidelines
Notes:
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.
Disclaimer: The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.
Source: FAA Aviation Circular 150/5020-1 (August 5, 1983)

2.2 Montgomery-Gibbs Executive Airport Land Use Compatibility Plan

The San Diego County Regional Airport Authority, serving as the Airport Land Use Commission, is responsible for the management and development of the Airport Land Use Compatibility Plan (ALUCP) for each public use and military airport in San Diego County. Each ALUCP identifies land use and noise level compatibility due to operations at airports as well as forecasted noise level contours based on future operations at each airport. These noise level contours and land use compatibility noise levels are used in determining whether a proposed land use is consistent with forecasted noise levels. Table 2 presents the land uses and the compatible noise levels.

Table 2 Airport Noise Compatibility Criteria				
Land Use Category[1] *Note: Multiple categories may apply to a project*	Exterior Noise Exposure (CNEL)			
	60-65	65-70	70-75	75+
Agriculture and Animal-Related				
Horse stables; livestock breeding or farming	A	A	A	
Nature preserves; wildlife preserves				
Interactive nature exhibits	A			
Zoos	A	A		
Agriculture (except residences and livestock); greenhouses; fishing				A
Recreational				
Children-oriented neighborhood parks; playgrounds	A			
Campgrounds; recreational vehicle/motor home parks				
Community parks; regional parks; golf courses; tennis courts; athletic fields; outdoor spectator sports; fairgrounds; water recreation facilities		A		
Recreation buildings; gymnasiums; club houses; athletic clubs; dance studios		50	50	
Public				
Outdoor amphitheaters	A			
Children's schools (K-12); day care centers (>14 children)	45			
Libraries	45			
Auditoriums; concert halls; indoor arenas; places of worship	45	45		
Adult schools; colleges; universities[2]	45	45		
Prisons; reformatories		50		
Public safety facilities (e.g., police, fire stations)		50		
Cemeteries; cemetery chapels; mortuaries		45 A	45 A	
Residential, Lodging, and Care				
Residential (including single-family, multi-family, and mobile homes): family day care homes (≤14 children)	45			
Extended-stay hotels; retirement homes; assisted living; hospitals; nursing homes; immediate care facilities	45			
Hotels; motels; other transient lodging[g]	45	45	45	
Commercial and Industrial				
Office buildings; office areas of industrial facilities; medical clinics; clinical laboratories; radio, television, recording studios		50	50	
Retail sales; eating/drinking establishments; movie theaters; personal services		50	50 B	
Wholesale sales; warehouses; mini/other indoor storage			50 C	
Industrial; manufacturing; research & development; auto, marine, other sales & repair services; car washes; gas stations; trucking, transportation terminals			50 C	
Extractive industry; utilities; road, rail rights-of-way; outdoor storage; public works yards; automobile parking; automobile dismantling; solid waste facilities				50 C
Animal shelters/kennels	50	50	50	

Table 2 Airport Noise Compatibility Criteria		
	Compatible	*Indoor Uses:* Standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor community noise equivalent level (CNEL) *Outdoor Uses:* Activities associated with the land use may be carries out with essentially no interference from aircraft noise
45 50	*Conditional*[4]	*Indoor Uses:* Building structure must be capable of attenuating exterior noise to the indoor CNEL indicated by the number; standard construction methods will normally suffice *Outdoor Uses:* CNEL is acceptable for outdoor activities, although some noise interference may occur
A B C	*Conditional*[4]	*Indoor or Outdoor Uses:* A – Caution should be exercised with regard to noise-sensitive outdoor uses; these uses are likely to be disrupted by aircraft noise events; acceptability is dependent upon characteristics of the specific use[5] B – Outdoor dining or gathering places incompatible above 70 CNEL C – Sound attenuation must be provided for associated office, retail, and other noise-sensitive indoor spaces sufficient to reduce exterior noise to an interior maximum of 50 CNEL
	Incompatible	Use is not compatible under any circumstances

[1]Land uses not specifically listed shall be evaluated, as determined by the ALUC, using the criteria for similar uses.
[2]Applies only to classrooms, offices, and related indoor uses. Laboratory facilities, gymnasiums, outdoor athletic facilities, and other uses to be evaluated as indicated for those land use categories.
[3]Lodging intended for stays by an individual person of no more than 25 days consecutively and no more than 90 days total per year; facilities for longer stays are in the extended- stay hotel category.
[4]An avigation easement is required for any project situated on a property lying within the projected 65 dB CNEL noise contour. See Policy 2.11.5 and Policy 3.3.3(d).
[5]Noise-sensitive land uses are ones for which the associated primary activities, whether indoor or outdoor, are susceptible to disruption by loud noise events. The most common types of noise-sensitive land uses include, but are not limited to, the following: residential, hospitals, nursing facilities, intermediate care facilities, educational facilities, libraries, museums, places of worship, child-care facilities, and certain types of passive recreational parks and open space.

SOURCE: San Diego County Regional Airport Authority 2010

2.3 City of San Diego General Plan

The Noise Element of the City's General Plan specifies compatibility guidelines for different categories of land use. The land use compatibility guidelines are summarized in Table 3. As shown, for a particular land use category, noise levels are either considered compatible, conditionally compatible, or incompatible. A "compatible" land use indicates that standard construction methods will attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with minimal noise interference. Evaluation of land use that falls into the "conditionally compatible" noise environment should have an acoustical study. For land uses indicated as conditionally compatible, structures must be capable of attenuating exterior noise to the indoor noise level shown in Table 3. For land uses indicated as incompatible, new construction should generally not be undertaken. Due to severe noise interference, outdoor activities are unacceptable and for structures, extensive mitigation techniques are required to make the indoor environment acceptable.

Table 3
City of San Diego – Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure [dB(A) CNEL]				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses, Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Places of Worship; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities)		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

Table 3 City of San Diego – Land Use – Noise Compatibility Guidelines			
	Compatible	Indoor Uses	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
	Conditionally Compatible	Indoor Uses	Building structure must attenuate exterior noise to the indoor noise level indicated by the number for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.
	Incompatible	Indoor Uses	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.
SOURCE: City of San Diego General Plan 2015.			

2.4 City of San Diego Municipal Code

2.4.1 On-Site Generated Noise

Section 59.5.0401 of the City's Noise Abatement and Control Ordinance states that:

A. It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit.

B. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts.

The applicable noise limits of the City's Noise Abatement and Control Ordinance are summarized in Table 4.

Table 4 Noise Abatement and Control Ordinance Noise Level Limits		
Land Use	Time of Day	One-Hour Average Sound Level [dB(A) L_{eq}]
Single-family Residential	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 45 40
Multi-family Residential (up to a maximum density of 1 unit/2,000 square feet)	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	55 50 45
All other Residential	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 55 50
Commercial	7:00 a.m. to 7:00 p.m. 7:00 p.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	65 60 60
Industrial or Agricultural	Anytime	75
SOURCE: City of San Diego Noise Abatement and Control Ordinance Section 59.5.0401.		

2.4.2 Construction Noise

Section 59.5.0404 of the City's Noise Abatement and Control Ordinance states that:

A. It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. . . .

B. . . . it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

Construction would be restricted to between the hours of 7:00 a.m. and 7:00 p.m. and construction noise levels may not exceed a 12-hour equivalent noise level [dB(A) $L_{eq(12)}$] of 75 dB(A) $L_{eq(12)}$ as assessed at or beyond the property line of a property zoned residential.

3.0 Existing Conditions

Generally, the character of the area surrounding Montgomery-Gibbs Executive Airport is highly developed in all directions. The airport is situated in a highly urbanized area in the southern portion of the Kearny Mesa Community Plan in the city of San Diego. This community is a major industrial and commercial center, with nearby land uses mostly compatible with the airport. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist less than one mile north of the project area north of Tech Way, about one mile southwest of Runway 5, south of the airport property, and less than two miles west of the departure end of Runway 28R.

Noise levels in the vicinity of the airport are expected to increase in the future, primarily due to a projected increase in aircraft operations. In addition, the fleet is expected to shift to a higher proportion of business jets and twin-engine turboprops and a lower proportion of single-engine piston aircraft.

The City is currently developing an airport master plan that will establish the long-term development plan for Montgomery-Gibbs Executive Airport. As a part of this process, the City has developed year 2017 noise contours (City of San Diego 2017). These noise contours are shown in Figure 4.

Image Source: Nearmap (flown January 2023)

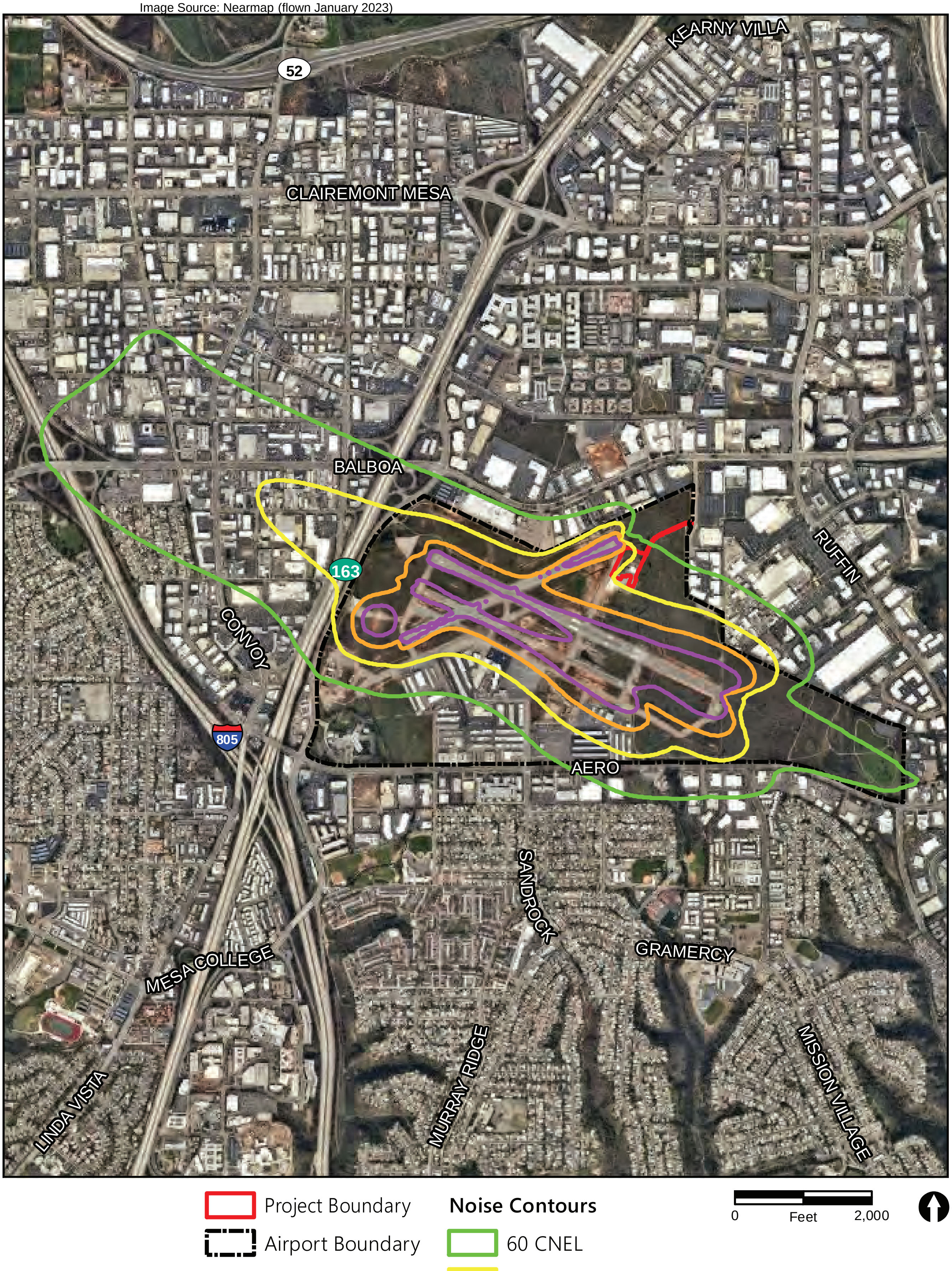


FIGURE 4
Baseline (2017) Master Plan Update Noise Contours

RECON

M:\JOBS5\9078\common_gis\fig4_nos.mxd 2/16/2023 fmm

4.0 Analysis Methodology

4.1 Construction Noise Analysis

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation; trenching for utilities; building construction, loading, unloading, and placing materials; and paving. Construction equipment with a diesel engine typically generates maximum noise levels from 70 to 95 dB(A) L_{eq} at a distance of 50 feet (Federal Highway Administration [FHWA] 2006). Table 5 summarizes typical construction equipment noise levels.

Table 5
Typical Construction Equipment Noise Levels

Equipment	Noise Level at 50 Feet [dB(A) L_{eq}][1]	Typical Duty Cycle[2]
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 kilovolt amps or less)	70	50%
Generator (more than 25 kilovolt amps)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%

SOURCE: FHWA 2006.
[1]Noise levels based on those specified in FHWA Road Construction Noise Model.
[2]Amount of time equipment operates at full power.

During site preparation and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Although maximum noise levels may be 70 to 95 dB(A) at a distance of 50 feet during most construction activities, hourly average noise levels would be less. For this analysis, the simultaneous operation of a loader, excavator, and dump truck was modeled during the site preparation and utilities activities, a crane, truck, pneumatic tools during the building construction activities, and a paver and roller during the paving activities.

Construction noise levels were calculated at the airport boundary and at the nearest residential uses. Construction noise is considered a point source and would attenuate at approximately 6 dB(A) for every doubling of distance. Noise levels attenuated for distance using the following equation:

$$N_{receiver} = N_{ref} + 20 \times \log(D_{ref} \div D_{receiver})$$

Where,
$N_{receiver}$ = Noise level at receiver
N_{ref} = Reference noise level (see Table 6)
D_{ref} = Reference distance (50 feet)
$D_{receiver}$ = Distance from center of construction activity to receiver

4.2 Aircraft Noise Analysis

As discussed in Section 2.1, aircraft noise screening may rule out the need for more detailed noise analysis and provide documented support for a Categorical Exclusion if screening shows no potential for significant noise impacts. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. This analysis calculates the change in noise levels due to the addition of project flights to the overall airport operations and compares the change in noise levels to the 1 dB screening threshold from the AEM approach to determine project impacts.

As discussed in Section 1.1, SDFR currently operates three helicopters consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk helicopter. By the first operational year, an additional Lockheed Martin/SikorskyS70i Firehawk helicopter would be included in the fleet. The final Bell 412 helicopter would be added to the fleet five years after the first operational year. Typical operations would include five daily flights, with one occurring during the nighttime hours.

Existing and future annual operations for Montgomery-Gibbs Executive Airport were obtained from the City (City of San Diego 2022), and the increase in noise due to the addition of project flights was calculated using the following formula:

$$\Delta dB = 10 \times log\, {}^{A}\!/_{B}$$

Where,
ΔdB = Change in noise level
A = Total number of flights with the project
B = Total number of flights without the project

5.0 Future Acoustical Environment and Impacts

5.1 Construction Noise

Noise associated with the site preparation and utilities, building, and paving for the project would potentially result in short-term impacts to surrounding properties. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist less than one mile north of the project area north of Tech Way, about one mile southwest of Runway 5, south of the airport property, and less than two miles west of the departure end of Runway 28R.

As discussed in Section 4.1, noise levels due to site preparation and utilities, building, and paving activities were calculated at the airport boundary and at the nearest residential use located north of Tech Way. The airport boundary is located approximately 740 feet from the center of proposed construction activities, and the nearest residential uses are located approximately 2,600 feet north of the center of proposed construction activities. Noise levels due to site preparation and utility trenching activities were calculated assuming the simultaneous operation of a loader, excavator, and dump truck. Noise levels due to building construction activities were calculated assuming the simultaneous operation of a crane, truck, and pneumatic tools. Noise levels due to paving activities were calculated assuming the simultaneous operation of a paver and roller. The results are summarized in Table 6. Construction noise calculations are provided in Attachment 1.

Table 6
Construction Noise Levels
[dB(A) L_{eq}]

	Total Noise Level at 50 Feet	Noise Level at Airport Boundary	Noise Level at Nearest Residential Uses
Site Preparation/Utilities	84	61	50
Building Construction	85	62	51
Paving	82	59	48

As shown, construction noise levels are not anticipated to exceed 75 dB(A) L_{eq} at any of the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that may be heard above ambient conditions, the exposure would be temporary. As construction activities associated with the project would comply with noise level limits from Noise Abatement and Control Ordinance Section 59.5.0404.

5.2 Aircraft Noise

The increase in noise levels due to the addition of project flights to the overall airport operations were calculated as described in Section 4.2. The results are summarized in Table 7. Calculations are provided in Attachment 2.

Table 7 Increase in Operational Noise Levels			
Year	Annual Operations without Project	Annual Operations with Project	ΔdB
2023	301,036	302,861	0.0
2024	301,638	303,463	0.0
2025	302,234	304,059	0.0
2026	302,832	304,657	0.0
2027	303,432	305,257	0.0
2028	304,033	305,858	0.0
2029	304,636	306,461	0.0
2030	305,241	307,066	0.0
2031	305,848	307,673	0.0
2032	306,456	308,281	0.0
2033	307,066	308,891	0.0
2034	307,678	309,503	0.0
2035	308,292	310,117	0.0
2036	308,907	310,732	0.0
2037	309,524	311,349	0.0
2038	310,143	311,968	0.0
2039	310,764	312,589	0.0
2040	311,386	313,211	0.0
2041	312,010	313,835	0.0
2042	312,636	314,461	0.0
2043	313,264	315,089	0.0
2044	313,894	315,719	0.0
2045	314,525	316,350	0.0
2046	315,158	316,983	0.0
2047	315,793	317,618	0.0
2048	316,430	318,255	0.0
2049	317,069	318,894	0.0
2050	317,709	319,534	0.0

As shown in Table 7, the project would not result in a measurable increase in airport operational noise levels. Noise level increases would be less than the 1 dB screening threshold. Therefore, aircraft noise screening rules out the need for more detailed noise analysis.

6.0 Conclusions

6.1 Construction Noise

Noise associated with the site preparation and utilities, building, and paving for the project would potentially result in short-term impacts to surrounding properties. Existing commercial, office, and industrial uses surround the airport on all sides. Residential land uses exist less than one mile north of the project area north of Tech Way, about one mile southwest of Runway 5, south of the airport property, and less than two miles west of the departure end of Runway 28R. As shown in Table 6, construction noise levels are not anticipated to exceed 75 dB(A) L_{eq} at any of the adjacent properties. Although the existing adjacent uses would be exposed to construction noise levels that may be heard above ambient conditions, the exposure would be temporary. Construction activities associated with the project would comply with noise level limits from Noise Abatement and Control Ordinance Section 59.5.0404.

6.2 Aircraft Noise

SDFR currently operates three helicopters from Montgomery-Gibbs Executive Airport consisting of two Bell 412 helicopters and one Lockheed Martin/SikorskyS70i Firehawk helicopter. By the first operational year, an additional Lockheed Martin/SikorskyS70i Firehawk helicopter would be included in the fleet. The final Bell 412 helicopter would be added to the fleet five years after opening year. This analysis calculates the change in noise levels due to the addition of project flights to the overall airport operations. As shown in Table 7, the project would not result in a measurable increase in airport operational noise levels. Noise level increases would be less than the 1 dB screening threshold. Therefore, aircraft noise screening rules out the need for more detailed noise analysis.

7.0 References Cited

California Department of Transportation (Caltrans)
2013 Technical Noise Supplement. November.

Federal Aviation Administration (FAA)
2015 FAA Order 1050.1F – Environmental Impacts: Policies and Procedures. Issued July 16, 2015.

2020 1050.1F Desk Reference.

Federal Highway Administration (FHWA)
2006 Roadway Construction Noise Model User's Guide. FHWA-HEP-05-054, SOT-VNTSC-FHWA-05-01. Final Report. January.

San Diego, City of
2015 City of San Diego General Plan Amendments. Resolution Number R- 309817 Final Environmental Impact Report No. 104495 Addendum R-309818. Adopted by City Council on June 29.

2017 Airport Master Plan, Montgomery-Gibbs Executive Airport, Working Paper 4 – Environmental Overview. Prepared by Atkins. October 2017.

2022 Airport Forecasting MYF. APO TAF Quick Data Summary Report – Facility. Western 2022 Scenario for Montgomery Gibbs Executive Airport.

San Diego County Regional Airport Authority (SDCRAA)
2010 Montgomery Field Airport Land Use Compatibility Plan. Adopted January 25, 2010. Amended December 20, 2010.

ATTACHMENTS

ATTACHMENT 1

Construction Noise Calculations

Site Preparation/Utilities	Max Noise Level at 50 feet	Duty Cycle	Average Noise Level at 50 feet	Distance to Airport Boundary	Noise Level at Airport Boundary	Distance to Nearest Residential	Noise Level at Nearest Residential
Loader	80	40%	76	740	53	2600	42
Excavator	85	40%	81	740	58	2600	47
Dump Truck	84	40%	80	740	57	2600	46
Total Noise Level			84	740	**61**	2600	**50**
Building Construction							
Crane	85	20%	78	740	55	2600	44
Truck	84	40%	80	740	57	2600	46
Pneumatic Tools	85	50%	82	740	59	2600	48
Total Noise Level			85	740	**62**	2600	**51**
Paving							
Paver	85	50%	82	740	59	2600	48
Roller	74	40%	70	740	47	2600	36
Total Noise Level			82	740	**59**	2600	**48**

ATTACHMENT 2

Operational Noise Increase Calculations

San Diego Fire-Rescue Operations Hangar Project - Operational Noise Level Increase

	Firehawks	Bells
Existing	1	2
Opening Year	2	2
5 Years	2	3

Daily Operations	5	flights
Annual Operations	1825	flights

Year	Without Project Annual Operations	With Project Annual Operations	% Increase	dB Increase
2017	201,631	203,456	0.9%	0.04
2018	224,237	226,062	0.8%	0.04
2019	246,851	248,676	0.7%	0.03
2020	264,527	266,352	0.7%	0.03
2021	298,946	300,771	0.6%	0.03
2022	300,435	302,260	0.6%	0.03
2023	301,036	302,861	0.6%	0.03
2024	301,638	303,463	0.6%	0.03
2025	302,234	304,059	0.6%	0.03
2026	302,832	304,657	0.6%	0.03
2027	303,432	305,257	0.6%	0.03
2028	304,033	305,858	0.6%	0.03
2029	304,636	306,461	0.6%	0.03
2030	305,241	307,066	0.6%	0.03
2031	305,848	307,673	0.6%	0.03
2032	306,456	308,281	0.6%	0.03
2033	307,066	308,891	0.6%	0.03
2034	307,678	309,503	0.6%	0.03
2035	308,292	310,117	0.6%	0.03
2036	308,907	310,732	0.6%	0.03
2037	309,524	311,349	0.6%	0.03
2038	310,143	311,968	0.6%	0.03
2039	310,764	312,589	0.6%	0.03
2040	311,386	313,211	0.6%	0.03
2041	312,010	313,835	0.6%	0.03
2042	312,636	314,461	0.6%	0.03
2043	313,264	315,089	0.6%	0.03
2044	313,894	315,719	0.6%	0.03
2045	314,525	316,350	0.6%	0.03
2046	315,158	316,983	0.6%	0.03
2047	315,793	317,618	0.6%	0.03
2048	316,430	318,255	0.6%	0.02
2049	317,069	318,894	0.6%	0.02
2050	317,709	319,534	0.6%	0.02

APPENDIX F
Jurisdictional Waters/Wetland Delineation Report

This page intentionally left blank

Jurisdictional Waters/Wetland Delineation Report for Phase II of the San Diego Fire-Rescue Air Operations Hangar Project, Montgomery-Gibbs Executive Airport, San Diego, California

Prepared for
City of San Diego
Real Estate Assets
Airports Division
3750 John J. Montgomery Drive, MS 14
San Diego, CA 92123

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

RECON Number 9078
February 16, 2023

Andrew Smisek, Senior Biologist

TABLE OF CONTENTS

ATTACHMENTS

Acronyms and Abbreviations

City	City of San Diego
FACU	facultative upland
FACW	facultative wetland
GPS	global positioning system
NI	no indicator
NRCS	Natural Resource Conservation Service
OBL	obligate
OHWM	Ordinary High Water Mark
RWQCB	Regional Water Quality Control Board
UDP	upland data point
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VPHCP	Vernal Pool Habitat Conservation Plan
WDP	wetland data point

1.0 Site Description and Landscape Setting

The project area is located in the northeastern corner of the Montgomery-Gibbs Executive Airport in the city of San Diego, California. It includes the main area proposed for project development and the access road leading from Ponderosa Avenue to the existing airport facilities. The Review Area for this analysis includes the project area plus a 100-foot buffer around the main portion of the project area (no buffer along the access road), totaling 7.98 acres (Attachment 1: Figure 1). The Review Area is found within an unsectioned portion of the Mission San Diego landgrant on the U.S. Geological Survey (USGS) 7.5-minute La Mesa and La Jolla quadrangles (Attachment 1: Figure 2, USGS 1975, 1996) and is presented on the City of San Diego 800-foot-scale maps, Number 234-1725 (Attachment 1: Figure 3). The Review Area is adjacent to the Air Traffic Control Tower between the Federal Aviation Administration lease area, the Runway Object Free Area, and the Runway Protection Zone for the northwest approach to Runway 5/23 (Attachment 1: Figure 4). Entry to the Review Area is via an asphalt road accessed from a security gate located off Ponderosa Avenue.

The majority of the Review Area occurs as mostly flat land vegetated with non-native grasses that had been mowed at the time of the survey. The Review Area includes a number of developed areas that are associated with the airport facilities.

The applicant will accompany the U.S. Army Corps of Engineers (USACE) on all site visits. The USACE must contact the applicant prior to visiting the site. The contact information for the applicant is:

Property Owner:	City of San Diego
Applicant:	City of San Diego Public Works Department
Project Biologist:	Sean Paver, Senior Planner – Biologist
Telephone:	(619) 533-3629
E-mail:	spaver@sandiego.gov

2.0 Site Alterations, Current and Past Land Use

A majority of the Review Area has been altered by regular mowing of the vegetated land surrounding the buildings and other developed areas. Mowing is conducted as part of airport maintenance activities. The land within the Review Area has likely been graded historically as it occurs as mostly flat and does not match the surrounding topography in undisturbed areas.

2.1 Soils

Information on the soil types sampled in the Review Area is summarized from the Soil Survey for San Diego County (U.S. Department of Agriculture [USDA] 1973), the San Diego Association of Governments' 1995 geographic information system data (SANDAG 1995), and the San Diego County Hydric Soils list obtained from the Natural Resource Conservation Service (NRCS; 2014).

One soil series, Redding gravelly loam (RdC), 2 to 9 percent slopes, has been mapped within the Review Area, appears on the hydric soil list, and is described below according to the classifications from the USDA characterizations of soil types in the County (USDA 1973; Attachment 1: Figure 5). These soils can be considered hydric soils when occurring in unnamed, ponded depressions (NRCS 2014).

2.2 Hydrology

The natural hydrology of the Review Area includes a network of shallow depressions, many of which function as vernal pools, as well as a small swale in the southeastern portion of the Review Area. The vernal pools occur mostly in the northern half of the Review Area, north of the developed areas. Some also occur east and west of the developed areas. These vernal pools pond seasonally during, and for extended periods following, rain events. The majority of vernal pools do not appear to be directly connected to each other or to any drainage courses. However, the vernal pools east of the access road may overflow into a nearby off-site drainage. The swale in the southeastern portion of the Review Area is fed by a culvert that drains some of the developed portions of the Review Area, and also may overflow into this off-site drainage. The off-site drainage has connectivity to downstream waterways within the San Diego River watershed. Along the access road portion of the Review Area, a culvert occurs under the paved road to allow overflow from potential vernal pools northwest of the road to those southeast of the road. This culvert and connected vernal pools likely also overflow into the nearby drainage.

2.3 Vegetation

Vegetation within the Review Area consists mostly of non-native grassland dominated by non-native bromes (*Bromus* sp.) and filaree (*Erodium* sp.). The presence of non-native grassland may be a result of the regular mowing mentioned above. Other herbaceous species scattered throughout these non-native grassland areas include fascicled tarweed (*Deinandra fasciculata*), graceful tarplant (*Holocarpha virgata*), and stinkwort (*Dittrichia graveolens*). Vegetation within the vernal pool depressions was notably different from the surrounding uplands areas, being dominated by hyssop loosestrife (*Lythrum hyssopifolia*) and dwarf woollyheads (*Psilocarphus brevissimus*). A small area in the northern portion of the Review Area and the eastern portion of the Review Area, east of the access road and developed areas, do not undergo regular mowing or maintenance and contains a mix of coastal sage scrub and native herbaceous vernal pool vegetation.

3.0 Precipitation Data and Analysis

Climate data, including precipitation totals, for the nearest recording station to the project site was gathered from the NRCS and National Water and Climate Center databases. The climate data obtained are discussed below.

3.1 Climate and Growing Season

The Review Area is located approximately seven miles from the Pacific Ocean, in an area generally characterized by warm, dry summers and mild winters, with the majority of precipitation typically falling between November and March. This area is influenced by coastal climate weather regimes, resulting in a marine layer during spring and early summer and milder summer temperatures than occur further inland. The growing season can vary but typically occurs after winter rains as temperatures begin to increase during the spring months and into early summer.

3.2 Precipitation and Natural Resource Conservation Service WETS Table Summary

Historical climate data for the nearest recording station to the Review Area is from San Diego Montgomery Field. Data summarized over the time period of 1971–2019 is presented in the WETS table (Attachment 2: Table 1). The total average annual precipitation for this time period and station is 9.79 inches. The total annual precipitation for 2019 was 9.31 inches.

Climate data summaries in 2019 for the months of April through June, which were prior to the first site visit, and July through October, which were prior to the second site visit, are provided in Attachment 2: Tables 2-8. Total 2019 precipitation for April was 0.35 inch, for May 1.03 inches, for June 0.09 inch, for July less than 0.01 inch, for August 0.00 inch, for September 0.06 inch, and for October 0.00 inch.

3.3 Wetland Hydrology and Analysis

The Review Area as a whole contains depressions that pond after rain events. Additionally, a swale occurs in the southern eastern portion of Review Area conveys flow from a culvert outfall eastward toward an off-site drainage and a culvert crosses under the paved access road portion of the Review Area.

4.0 Investigation Methods

RECON Environmental, Inc. wetland specialists Andrew Smisek and Karyl Field performed a routine aquatic resource delineation within the Review Area on July 17, 2019. Mr. Smisek conducted a follow-up site visit on November 1, 2019. The aquatic resources delineation was performed according to the guidelines set forth by the U.S. Army Corps of Engineers (USACE; 1987, 2008). The potential jurisdictional areas were surveyed by walking throughout the site and making observations of those areas exhibiting characteristics of jurisdictional waters or wetlands. During both surveys, the RECON biologist was accompanied by a City of San Diego (City) biologist familiar with the known vernal pools and other biological resources on-site.

4.1 Wetland Parameters

4.1.1 Hydrophytic Vegetation

The wetland indicator status of each species recorded was determined by using the National Wetland Plant List (Lichvar et al. 2016). Plant species nomenclature follows that contained in the Jepson eFlora (Jepson Flora Project 2019). Dominant species with an indicator status of "NI" (not indicated) or not listed in the 2016 plant list were evaluated as either wetland or upland indicator species based on local professional knowledge of where the species are most often observed in habitats that are characteristic in southern California.

The vegetation of each vernal pool was assessed using the wetland determination data forms to determine if the hydrophytic vegetation parameter was met for each (Attachment 3). The presence of vernal pool indicator plant species was also noted.

4.1.2 Hydric Soils

Soil test pits were located: (1) within potential wetland areas and (2) in or adjacent to the spot where the boundary between wetland and upland was inferred (based on changes in the topography, hydrology, and composition of the vegetation). A total of 12 paired sample points were assessed, each pair containing a wetland data point (WDP) and an upland data point (UDP), with the exception that one upland point, UDP9/10 was paired with both WDP9 and WDP10 (see Attachment 3). The depth of the majority of pits dug during the surveys was restricted by a layer of hard rock and/or compact soil. In addition, in order to minimize impacts to the subsurface soil layers and the ponding ability of any given vernal pool basin, soil pits dug within basins were limited to only the depth necessary to determine the presence of hydric soils.

4.1.3 Wetland Hydrology

Hydrologic information for the site was obtained by reviewing USGS topographic maps and by directly observing hydrology indicators in the field. The hydrology indicators of each vernal pool and the swale were assessed using the wetland determination data forms to determine if the hydrology parameter was met for each (see Attachment 3).

4.2 Pre-Field Review

Prior to conducting the delineation, an aerial photograph, the USGS La Mesa (1975) & La Jolla (1996) quadrangles, and the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory were examined to aid in the determination of potential waters of the U.S. on-site (USFWS 2019; Attachment 1: Figure 6). Additionally, data provided by the City was analyzed prior to the surveys. This data includes the presence of vernal pool indicator plant species and fairy shrimp within a number of basins within the Review Area.

4.3 On-site Wetland Investigation

Once on-site, the parcel of land was examined to determine the presence of any indicators of wetlands, including wetland vegetation, hydric soils, and hydrology. In areas where signs of ponding were evident, special attention was paid to USACE vernal pool indicator species (USACE 1997).

Field data, including hand drawn maps and recorded global positioning system (GPS) points and lines, were later digitized/downloaded into ArcGIS. Mapped jurisdictional waters created using these data were analyzed in ArcGIS to provide acreages or target jurisdictional and vegetation boundaries.

USACE wetland determination data forms are included as Attachment 3. Photographs of the Review Area are provided in Attachment 4.

4.4 On-site Ordinary High Water Mark Investigation

No potential non-wetland waters were observed during the surveys, so no Ordinary High Water Mark (OHWM) data was collected. The swale in the southeastern portion of the Review Area does not exhibit an obvious bed and bank structure that would necessitate a delineation of the lateral extent of OHWM features. The culvert along the access road portion of the Review Area was not sampled during the surveys.

5.0 Description of All Wetlands and Other Non-wetland Waters

The aquatic resources delineated include a total of 15 vernal pools and 1 wetland swale within the Review Area (Attachment 1: Figure 7 and Attachment 4). Five of the 15 vernal pools extend outside the limits of the Review Area. Therefore, only the areas of the portions occurring within the Review Area were used to calculate the total acreage of jurisdictional resources within the Review Area. The culvert that crosses under the paved access road within the Review Area is assumed to be considered non-wetland waters of the U.S. The aquatic resource features delineated within the Review Area total 0.187 acre of wetland waters of the U.S. and 24 square feet (15.5 linear feet) of non-wetland waters of the U.S. A summary of the aquatic resources and location of these resources in relation to the Review Area boundary is provided in Attachment 2: Table 9 and on Attachment 1: Figure 7, respectively.

5.1 Wetlands

Wetlands delineated on the site include vernal pools and a swale. Each is discussed separately below.

5.1.1 Vernal Pool Wetlands

Of the 11 vernal pools sampled within the Review Area, nine met the hydrophytic vegetation standard via the dominance test or prevalence index. The remaining two vernal pools were not sufficiently dominated by hydrophytic plant species to pass the dominance test or prevalence index. However, these two pools are still considered to meet the hydrophytic vegetation parameter under a problematic wetland; where the vegetation criteria are considered met when the area meets both the hydric soils and wetland hydrology criteria. In fact, all of the vernal pools sampled within the Review Area could be considered to be problematic wetlands for vegetation because regular mowing occurs throughout these areas, which has likely significantly altered the percent cover and distribution of hydrophytic vegetation. The four vernal pools that were not sampled include one in the northern portion of the Review Area and three in the eastern portion, east of the access road. As mentioned above, these areas do not undergo regular mowing and, therefore, would not be considered to be problematic wetlands for vegetation. Based on data provided by the City, hydrophytic vegetation is assumed present within these four unsampled vernal pools.

Additionally, all 11 of the sampled vernal pools within the Review Area contain at least one vernal pool indicator plant species. The vernal pool plant indicator species observed includes dwarf woollyheads (*Psilocarphus brevissimus*; facultative wetland [FACW]) and Lemmon's canarygrass (*Phalaris lemmonii*; FACW). Dwarf wollyheads and hyssop loosestrife (*Lythrum hyssopifolia*; obligate [OBL]) dominated the vegetation cover within the majority of the vernal pool depressions.

The distribution of hydrophytic plant species and upland plant species throughout the Review Area clearly followed local topographic trends, with hydrophytic species being dominant within the depressions of the vernal pools and upland species being dominant outside the margin of the vernal pools. The common upland plant species observed included red brome (*Bromus madritensis* ssp. *rubens*; UPL), filaree (facultative upland [FACU]) and fascicled tarweed (FACU). Hydrophytic plant species, such as dwarf wollyheads and hyssop loosestrife, were occasionally observed in upland areas outside the topographic depression of the vernal pools within the Review Area, likely because these areas occur only inches above the vernal pool basins and may stay wet enough during some rain years to support individuals of these hydrophytic species. However, where hydrophytic plant species occurred in upland areas outside the vernal pools, they were observed with very low vegetation cover.

One hydric soil indicator, redox depressions, was observed during the surveys within all 11 vernal pools sampled (see Attachment 3, WDPs 1 through 11). This hydric soil indicator occurs in closed depressions that are subject to ponding. At each WDP, redox concentrations were observed within a layer at least 2 inches thick within the first 6 inches from the soil surface. In many cases, soil pits were only dug to 2 or 3 inches because redox concentrations were prevalent at these depths, just below the surface. Based on data provided by the City, hydric soils are assumed present within the four unsampled vernal pools.

The source of the water for the vernal pools is primarily from natural rainfall and local runoff from the surrounding land. The water that reaches these vernal pools is seasonal, temporarily ponds within the limits of the pools. Wetland hydrology indicators observed in a majority of the vernal pools within the Review Area included biotic crusts. Surface soil cracks were observed at WDP 2. The known presence of aquatic invertebrates (e.g., fairy shrimp), based on the City's data for on-site vernal pools, is also a primary indicator of wetland hydrology; as found in vernal pools at WDP 1, 3, 4, 5, 6, 7, 8, and 11 (see Attachment 3). Based on data provided by the City, wetland hydrology is assumed present within the four unsampled vernal pools.

5.1.2 Swale Wetland

As mentioned above, the swale in the southeastern portion of the Review Area is fed by a culvert leading from the existing developed structures. The vegetation observed within this swale includes a number of herbaceous hydrophytic plant species, including hyssop loosestrife, tall flatsedge (*Cyperus eragrostis*; FACW), and toad rush (*Juncus bufonius*; FACW). Outside of the swale, the surrounding upland areas contained Diegan coastal sage scrub dominated by California buckwheat (*Eriogonum fasciculatum*; no indicator [NI]) and red brome.

One hydric soil indicator, redox depressions, was observed within the wetland swale (see Attachment 3, WDP 12). This swale appears to function as a depression based on local topography, but it does not contain vernal pool indicator plant species. Both biotic crusts and non-riverine sediment deposits were observed during the survey. This swale has direct connectivity to a drainage that occurs just outside the Review Area which receives overflowing water from the swale. From here, water is conveyed southward off-site through a culvert and into a series of storm drains and canyons as part of the downstream watershed.

5.2 Non-wetland Waters

The culvert that crosses under the paved access road within the Review Area is assumed to be considered non-wetland waters of the U.S. (see Attachment 1, Figure 7). However, this culvert was not sampled during the surveys. The total estimate area for this non-wetland water feature is 24 square feet and 15.5 linear feet.

5.3 Waters of the State

The waters of the state under the jurisdiction of the Regional Water Quality Control Board (RWQCB) delineated within the Review Area entirely overlap with those waters of the U.S. described above, including the vernal pools, swale, and culvert. RWQCB waters within the Review Area total 0.187 acre of wetland waters of the state and 24 square feet (15.5 linear feet) of non-wetland waters of the state (Attachment 1, Figure 8).

5.4 City Wetlands

The City wetlands delineated within the Review Area include the vernal pools and the swale mapped as wetland waters of the U.S. as described above. But City wetlands on-site do not include the culvert mapped as non-wetland waters of the U.S. Therefore, City wetlands within the Review Area total 0.187 acre (Attachment 1, Figure 9).

6.0 Deviation from National Wetland Inventory

The results of this analysis vary substantially from the National Wetland Inventory (see Attachment 1, Figure 6). The National Wetlands Inventory includes a temporarily flooded Freshwater Forested/Shrub Wetland (code PSSA) crossing the access road within the Review Area, but does not include any other aquatic resource features within the Review Area. Based on this analysis and data provided by the City, a number of vernal pools occur within the Review Area and the surrounding undeveloped land.

7.0 Mapping Method

The maps of the delineated jurisdictional waters within the Review Area are based on the above analysis. The boundary of the majority of aquatic resource was obtained from previously collected data provided by the City. Additionally, the boundaries of two vernal pools were mapped during the surveys using sub-meter resolution GPS technology. The location of the culvert along the access road was estimated using aerial photography. GIS mapping software (ArcMap) was used to produce the graphical maps contained in this report.

8.0 Results and Conclusions

USACE jurisdictional waters include all 15 vernal pools mapped within the Review Area, as well as the swale in the southeastern portion of the Review Area. As described above, the vernal pools and the swale all meet the three wetland parameters and, therefore, would be considered wetland waters of the U.S. (see Attachment 1: Figure 7). The water type for the vernal pools is considered "isolate" (see Attachment 2, Table 10), as they do not have a distinct connection to any wetland or non-wetland water drainage courses. However, the water type for the ephemeral swale and culvert are considered to be "non-relatively permanent waters" (see Attachment 2, Table 10) due to their connectivity with an off-site jurisdictional drainage.

9.0 Disclaimer Statement

This report describes the results of a jurisdictional waters delineation conducted within the 7.98-acre Review Area. The jurisdictional waters delineation is used to identify and map the extent of the federal jurisdictional waters of the U.S. The purpose of this study was to identify and map the limits of any jurisdictional water features on the property to provide necessary background information for analysis by USACE in making a jurisdictional determination. USACE will review the content of this report and ultimately make a determination of federal jurisdiction for any waters of the U.S. that may be present in the Review Area. References used in the preparation of this report are included below in Attachment 5.

ATTACHMENTS

ATTACHMENT 1

Maps

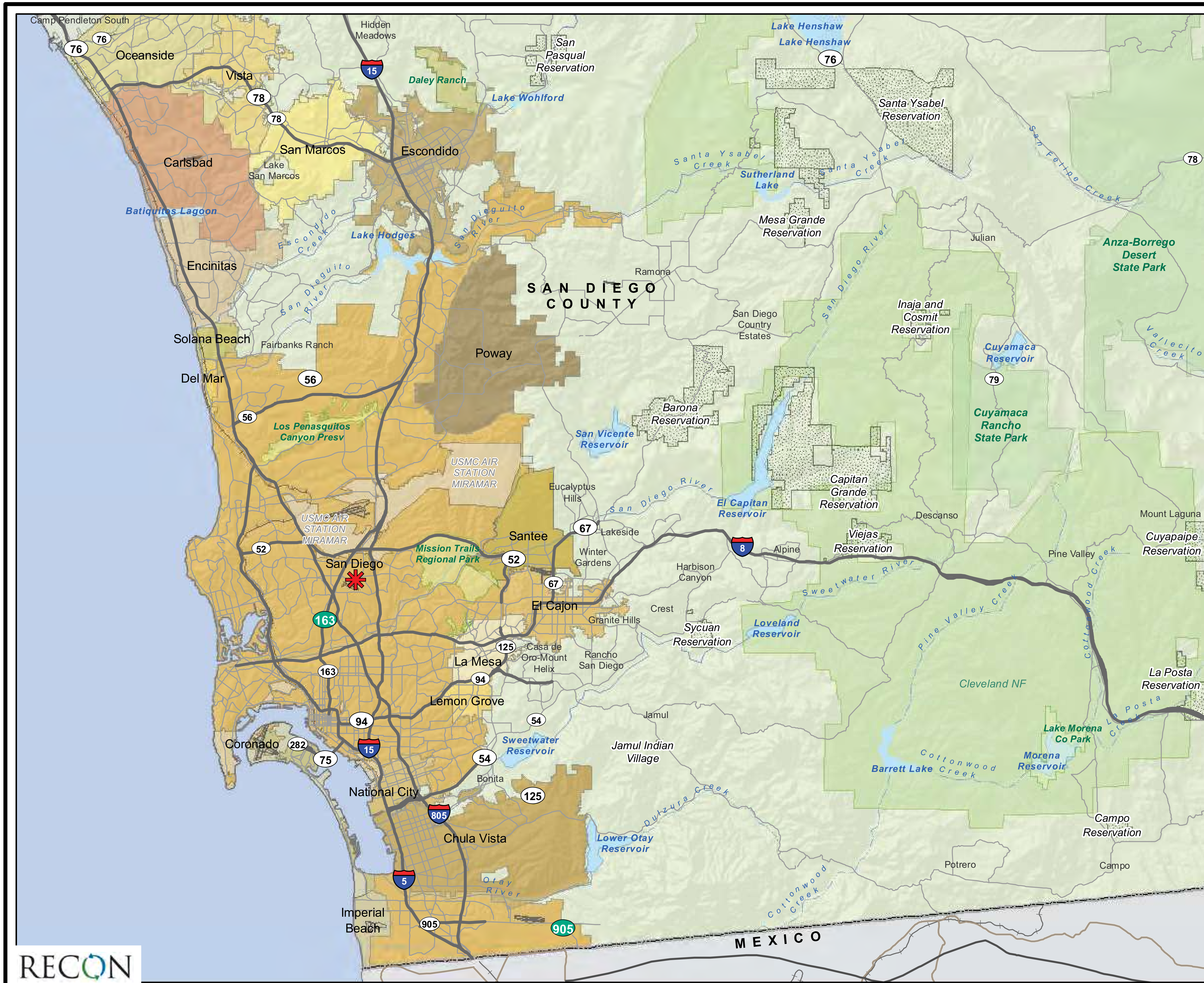
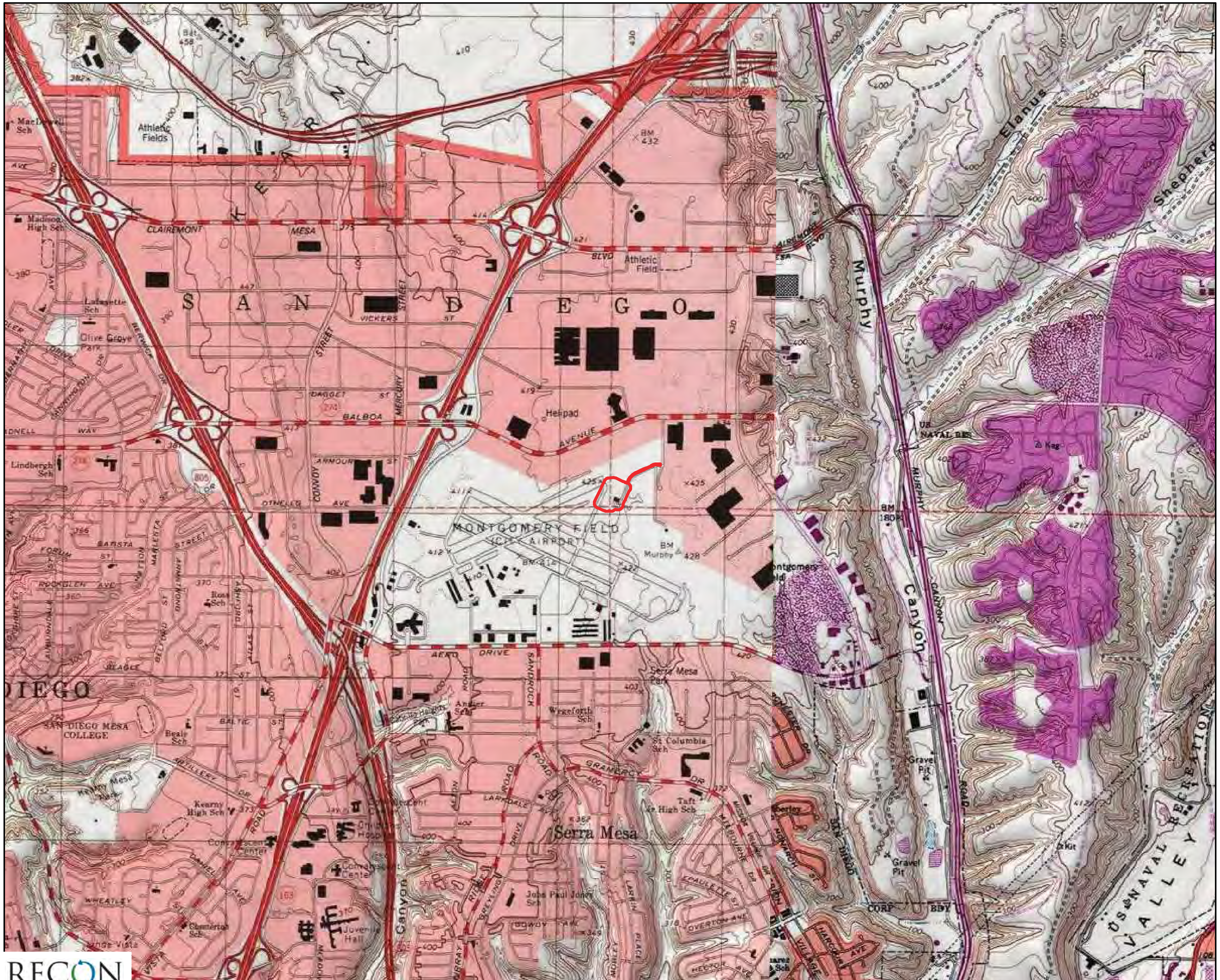


FIGURE 1:
REGIONAL LOCATION

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019



Review Area

Map Source: USGS 7.5 minute topographic map series, La Mesa (1975) & La Jolla (1996) quadrangles, Mission San Diego Land Grant

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 4,000

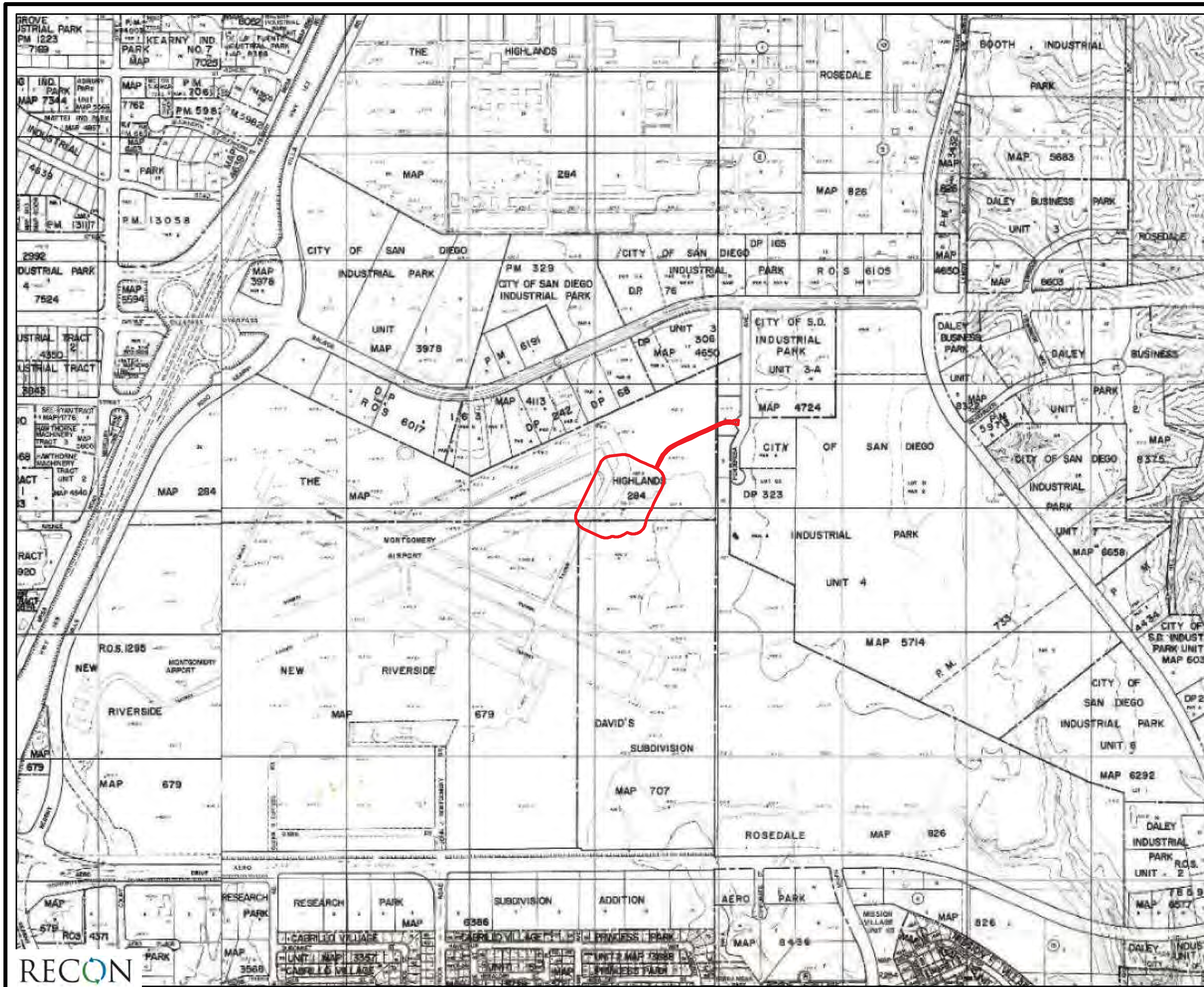
FIGURE 2:
PROJECT LOCATION
ON USGS MAP

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

RECON

M:\JOBS5\9078\common_gis\fig2_wetdel.mxd fmm



Review Area

Map Source: City of San Diego,
Engineering and Development Department,
City 800' Maps, Number 234-1725

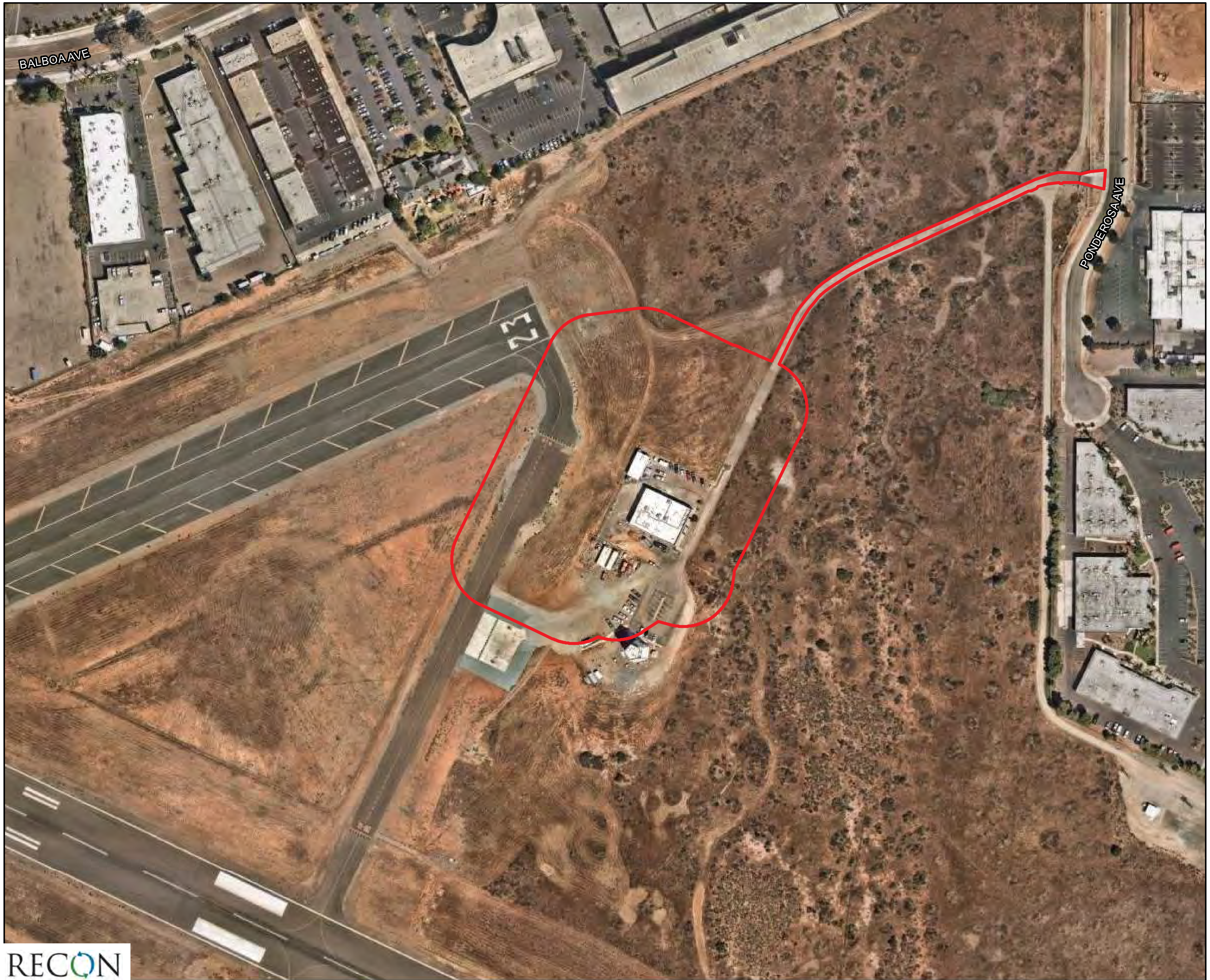
Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 1,600

FIGURE 3:
PROJECT LOCATION
ON CITY 800' MAP

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019



Review Area

Image Source: Nearmap (flown September 2019)

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 400

FIGURE 4:
PROJECT LOCATION ON
AERIAL PHOTOGRAPH

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

Review Area

Soils

OhE, Olivenhain Cobbly Loam

RdC, Redding Gravelly Loam

RfF, Redding Cobbly Loam Dissected

Image Source: Nearmap (flown September 2019)

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 1,000

FIGURE 5:
NRCS SOIL TYPES

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

FIGURE 6:
NATIONAL WETLANDS INVENTORY

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

Review Area

Non-wetland Waters (18-inch culvert)

Wetlands (vernal pool)

Wetlands (swale)

Wetland Data Form Point (WDP)

Upland Data Form Point (UDP)

Photo Points (PP)

Topography (2-foot Contour Interval)

Image Source: Nearmap (flown September 2019)

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 250

FIGURE 7:
WATERS OF THE U.S.

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

Review Area

Non-wetland Waters (18-inch culvert)

RWQCB Wetlands (vernal pool)

RWQCB Wetlands (swale)

Wetland Data Form Point (WDP)

Upland Data Form Point (UDP)

Photo Points (PP)

Topography (2-foot Contour Interval)

Image Source: Nearmap (flown September 2019)

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 250

FIGURE 8:
WATERS OF THE STATE

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

Review Area
18-inch Culvert
Wetlands (vernal pool)
Wetlands (swale)
Wetland Data Form Point (WDP)
Upland Data Form Point (UDP)
Photo Points (PP)
Topography
(2-foot Contour Interval)

Image Source: Nearmap (flown September 2019)

Coordinate System:
State Plane California VI (FIPS 406, Feet)
Datum: NAD 1983

0 Feet 250

FIGURE 9:
CITY OF SAN DIEGO
WETLANDS

SAN DIEGO FIRE-RESCUE
AIR OPERATIONS
HANGAR PROJECT
SAN DIEGO, CA

SEPTEMBER 24, 2019

ATTACHMENT 2

Tables

Attachment 2: Table 1

WETS Table

WETS Station: SAN DIEGO MONTGOMERY FIELD, CA								
Requested years: 1971 - 2019								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	67.5	45.9	56.7	1.75	0.45	2.04	3	-
Feb	66.5	46.6	56.6	2.38	1.00	2.80	4	-
Mar	68.0	49.7	58.9	0.97	0.49	1.19	3	-
Apr	69.7	52.3	61.0	0.73	0.23	0.86	2	-
May	70.8	56.7	63.8	0.34	0.08	0.29	1	-
Jun	74.2	60.2	67.2	0.03	0.00	0.04	0	-
Jul	79.4	64.6	72.0	0.13	0.00	0.00	0	-
Aug	81.3	65.5	73.4	0.01	0.00	0.01	0	-
Sep	80.8	63.6	72.2	0.18	0.00	0.14	0	-
Oct	77.1	58.0	67.5	0.61	0.11	0.56	1	-
Nov	72.1	50.7	61.4	0.87	0.34	1.05	2	-
Dec	66.7	45.4	56.0	1.80	0.60	2.15	3	-
Annual:					7.75	11.09		
Average	72.8	54.9	63.9	-	-	-	-	-
Total	-	-	-	9.79			20	-

GROWING SEASON DATES			
Years with missing data:	24 deg = 27	28 deg = 27	32 deg = 28
Years with no occurrence:	24 deg = 22	28 deg = 22	32 deg = 21
Data years used:	24 deg = 22	28 deg = 22	32 deg = 21
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	No occurrence
70 percent *	No occurrence	No occurrence	No occurrence
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1998				1.60	0.82	0.14	T	0.01	0.10	0.06	1.15	0.88	4.76
1999	2.06	0.69	1.23	1.65	T	0.07	0.03	0.00	0.08	0.01	0.05	0.17	6.04
2000	0.21	3.61	1.17	0.56	0.02	T	T	0.01	0.04	1.12	0.16	0.02	6.92
2001	2.70	2.56	0.75	M0.97	T	T	T	0.00	0.01	0.02	0.87	0.54	8.42
2002	0.47	0.10	0.71	0.72	0.01	0.00	T	0.00	0.37	0.13	1.33	2.41	6.25
2003	0.08	3.55	1.43	1.86	0.58	0.06	0.04	0.02	T	0.05	0.56	0.98	9.21
2004	0.61	2.87	0.27	0.47	T	T	0.00	T	0.01	5.05	0.45	1.76	11.49
2005	5.29	5.72	2.41	0.44	M0.29	T	T	0.00	0.15	0.69	0.17	0.34	15.50
2006	0.64	1.34	2.42	1.69	0.64	0.07	0.26	0.02	T	0.95	0.35	0.86	9.24
2007	0.58	2.53	0.21	0.71	T	0.00	0.00	T	0.09	0.22	1.67	1.38	7.39

2008	3.88	1.81	0.18	0.01	0.26	0.02	T	T	T	0.06	1.65	3.85	11.72
2009	0.14	5.40	0.16	0.16	0.03	0.03	0.00	T	0.00	0.08	0.42	M3.27	9.69
2010	M5.24	2.74	0.50	1.89	T	T	T	0.00	0.21	1.89	1.16	6.49	20.12
2011	0.15	3.47	1.78	0.28	0.45	0.05	T	T	0.11	0.70	3.08	0.61	10.68
2012	0.45	M1.55	1.35	1.16	0.02	0.00	T	0.02	0.00	0.51	0.37	2.93	8.36
2013	1.35	0.65	1.31	0.08	0.35	0.00	T	T	T	0.51	0.29	0.41	4.95
2014	0.04	1.31	0.99	0.35	T	0.00	0.07	0.08	1.08	T	0.55	1.75	6.22
2015	0.09	T	M0.17	0.07	1.81	0.09	2.46	0.01	1.05	0.69	1.97	1.58	9.99
2016	4.47	0.06	1.08	0.88	0.60	T	0.00	0.00	0.38	0.16	0.92	4.81	13.36
2017	4.32	4.96	0.15	0.02	0.59	0.03	T	T	0.11	T	0.02	0.07	10.27
2018	1.94	0.46	1.08	0.05	0.04	0.00	T	0.00	0.00	0.50	1.04	2.69	7.80
2019	M2.09	4.51	1.10	0.35	1.03	0.09	T	0.00	0.06	0.00	M0.08		9.31
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2016-07-22													

Attachment 2: Table 2

Climatological Data for ALPINE, CA - April 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-04-01	82	56	69.0	29	19	0.00	M	M
2019-04-02	69	48	58.5	19	9	0.00	M	M
2019-04-03	64	51	57.5	18	8	0.12	M	M
2019-04-04	64	48	56.0	16	6	0.00	M	M
2019-04-05	57	50	53.5	14	4	0.06	M	M
2019-04-06	69	50	59.5	20	10	0.01	M	M
2019-04-07	80	47	63.5	24	14	0.00	M	M
2019-04-08	88	56	72.0	32	22	0.00	M	M
2019-04-09	73	54	63.5	24	14	0.00	M	M
2019-04-10	71	43	57.0	17	7	0.00	M	M
2019-04-11	71	44	57.5	18	8	0.00	M	M
2019-04-12	67	48	57.5	18	8	0.00	M	M
2019-04-13	76	47	61.5	22	12	0.00	M	M
2019-04-14	77	49	63.0	23	13	0.00	M	M
2019-04-15	72	47	59.5	20	10	0.00	M	M
2019-04-16	57	51	54.0	14	4	0.00	M	M
2019-04-17	77	48	62.5	23	13	0.00	M	M
2019-04-18	85	49	67.0	27	17	0.00	M	M
2019-04-19	83	54	68.5	29	19	0.00	M	M
2019-04-20	69	51	60.0	20	10	0.00	M	M
2019-04-21	67	51	59.0	19	9	0.00	M	M
2019-04-22	72	48	60.0	20	10	0.00	M	M
2019-04-23	78	49	63.5	24	14	0.00	M	M
2019-04-24	83	54	68.5	29	19	0.00	M	M
2019-04-25	83	53	68.0	28	18	0.00	M	M
2019-04-26	77	51	64.0	24	14	0.00	M	M
2019-04-27	76	52	64.0	24	14	0.00	M	M
2019-04-28	76	51	63.5	24	14	0.00	M	M
2019-04-29	59	52	55.5	16	6	0.11	M	M
2019-04-30	58	50	54.0	14	4	0.18	M	M
Average|Sum	72.7	50.1	61.4	649	349	0.48	M	M

Attachment 2: Table 3

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - May 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-05-01	69	58	63.5	24	14	0.00	0.0	0
2019-05-02	69	56	62.5	23	13	0.00	0.0	0
2019-05-03	72	56	64.0	24	14	0.00	0.0	0
2019-05-04	73	57	65.0	25	15	0.00	0.0	0
2019-05-05	70	57	63.5	24	14	T	0.0	0
2019-05-06	70	58	64.0	24	14	0.04	0.0	0
2019-05-07	68	58	63.0	23	13	T	0.0	0
2019-05-08	64	56	60.0	20	10	T	0.0	0
2019-05-09	64	57	60.5	21	11	0.04	0.0	0
2019-05-10	65	56	60.5	21	11	0.04	0.0	0
2019-05-11	70	57	63.5	24	14	0.12	0.0	0
2019-05-12	71	57	64.0	24	14	0.00	0.0	0
2019-05-13	70	60	65.0	25	15	0.00	0.0	0
2019-05-14	73	59	66.0	26	16	0.00	0.0	0
2019-05-15	66	59	62.5	23	13	0.00	0.0	0
2019-05-16	66	56	61.0	21	11	0.10	0.0	0
2019-05-17	67	51	59.0	19	9	T	0.0	0
2019-05-18	70	50	60.0	20	10	0.00	0.0	0
2019-05-19	65	54	59.5	20	10	0.16	0.0	0
2019-05-20	64	53	58.5	19	9	0.23	0.0	0
2019-05-21	64	53	58.5	19	9	0.01	0.0	0
2019-05-22	63	54	58.5	19	9	0.12	0.0	0
2019-05-23	66	53	59.5	20	10	T	0.0	0
2019-05-24	68	50	59.0	19	9	0.00	0.0	0
2019-05-25	66	52	59.0	19	9	0.00	0.0	0
2019-05-26	62	54	58.0	18	8	0.15	0.0	0
2019-05-27	64	51	57.5	18	8	0.02	0.0	0
2019-05-28	67	48	57.5	18	8	0.00	0.0	0
2019-05-29	70	54	62.0	22	12	0.00	0.0	0
2019-05-30	71	58	64.5	25	15	0.00	0.0	0
2019-05-31	68	58	63.0	23	13	0.00	0.0	0
Average|Sum	67.6	55.2	61.4	670	360	1.03	0.0	0.0

Attachment 2: Table 4

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - June 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-06-01	66	58	62.0	22	12	0.00	0.0	M
2019-06-02	68	58	63.0	23	13	0.00	0.0	0
2019-06-03	67	58	62.5	23	13	0.01	0.0	0
2019-06-04	67	59	63.0	23	13	T	0.0	0
2019-06-05	70	59	64.5	25	15	0.00	0.0	0
2019-06-06	70	59	64.5	25	15	0.00	0.0	0
2019-06-07	69	60	64.5	25	15	0.00	0.0	0
2019-06-08	70	59	64.5	25	15	0.00	0.0	0
2019-06-09	82	58	70.0	30	20	0.00	0.0	0
2019-06-10	91	57	74.0	34	24	0.00	0.0	0
2019-06-11	79	59	69.0	29	19	0.00	0.0	0
2019-06-12	76	62	69.0	29	19	0.00	0.0	0
2019-06-13	72	59	65.5	26	16	0.00	0.0	0
2019-06-14	70	60	65.0	25	15	0.00	0.0	0
2019-06-15	71	61	66.0	26	16	0.00	0.0	0
2019-06-16	69	60	64.5	25	15	0.00	0.0	0
2019-06-17	65	59	62.0	22	12	0.00	0.0	0
2019-06-18	72	60	66.0	26	16	0.00	0.0	0
2019-06-19	73	58	65.5	26	16	0.00	0.0	0
2019-06-20	69	60	64.5	25	15	0.02	0.0	0
2019-06-21	68	59	63.5	24	14	0.06	0.0	0
2019-06-22	72	60	66.0	26	16	0.00	0.0	0
2019-06-23	74	62	68.0	28	18	0.00	0.0	0
2019-06-24	70	61	65.5	26	16	0.00	0.0	0
2019-06-25	69	60	64.5	25	15	0.00	0.0	0
2019-06-26	70	60	65.0	25	15	0.00	0.0	M
2019-06-27	74	60	67.0	27	17	0.00	0.0	M
2019-06-28	77	61	69.0	29	19	0.00	0.0	M
2019-06-29	83	60	71.5	32	22	0.00	0.0	M
2019-06-30	86	63	74.5	35	25	0.00	0.0	M
Average|Sum	72.6	59.6	66.1	791	491	0.09	0.0	0.0

Attachment 2: Table 5

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - July 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-07-01	79	60	69.5	30	20	0.00	0.0	0
2019-07-02	74	61	67.5	28	18	0.00	0.0	0
2019-07-03	71	61	66.0	26	16	0.00	0.0	0
2019-07-04	72	62	67.0	27	17	0.00	0.0	0
2019-07-05	73	61	67.0	27	17	0.00	M	M
2019-07-06	73	62	67.5	28	18	0.00	M	M
2019-07-07	73	62	67.5	28	18	0.00	M	M
2019-07-08	71	61	66.0	26	16	0.00	M	M
2019-07-09	77	63	70.0	30	20	0.00	M	M
2019-07-10	79	60	69.5	30	20	0.00	M	M
2019-07-11	79	63	71.0	31	21	0.00	M	M
2019-07-12	78	62	70.0	30	20	0.00	M	M
2019-07-13	76	61	68.5	29	19	0.00	M	M
2019-07-14	79	61	70.0	30	20	0.00	M	M
2019-07-15	83	62	72.5	33	23	0.00	M	M
2019-07-16	75	61	68.0	28	18	0.00	M	M
2019-07-17	72	61	66.5	27	17	0.00	M	M
2019-07-18	79	63	71.0	31	21	0.00	M	M
2019-07-19	73	63	68.0	28	18	0.00	M	M
2019-07-20	76	64	70.0	30	20	0.00	M	M
2019-07-21	78	65	71.5	32	22	0.00	M	M
2019-07-22	83	65	74.0	34	24	T	M	M
2019-07-23	88	68	78.0	38	28	0.00	M	M
2019-07-24	92	70	81.0	41	31	0.00	M	M
2019-07-25	90	71	80.5	41	31	0.00	M	M
2019-07-26	87	68	77.5	38	28	0.00	M	M
2019-07-27	85	68	76.5	37	27	0.00	M	M
2019-07-28	78	64	71.0	31	21	0.00	M	M
2019-07-29	80	63	71.5	32	22	0.00	M	M
2019-07-30	74	64	69.0	29	19	0.00	M	M
2019-07-31	78	62	70.0	30	20	0.00	M	M
Average|Sum	78.2	63.3	70.8	960	650	T	0.0	0.0

Attachment 2: Table 6

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - August 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-08-01	81	65	73.0	33	23	0.00	0.0	0
2019-08-02	83	65	74.0	34	24	0.00	0.0	0
2019-08-03	79	65	72.0	32	22	0.00	0.0	0
2019-08-04	81	62	71.5	32	22	0.00	0.0	0
2019-08-05	83	64	73.5	34	24	0.00	0.0	0
2019-08-06	79	65	72.0	32	22	0.00	0.0	0
2019-08-07	77	64	70.5	31	21	0.00	0.0	0
2019-08-08	78	63	70.5	31	21	0.00	0.0	0
2019-08-09	78	61	69.5	30	20	0.00	0.0	0
2019-08-10	78	65	71.5	32	22	0.00	0.0	0
2019-08-11	75	63	69.0	29	19	0.00	0.0	0
2019-08-12	75	62	68.5	29	19	0.00	0.0	0
2019-08-13	80	61	70.5	31	21	0.00	0.0	0
2019-08-14	82	61	71.5	32	22	0.00	0.0	0
2019-08-15	82	62	72.0	32	22	0.00	0.0	0
2019-08-16	77	62	69.5	30	20	0.00	0.0	0
2019-08-17	75	62	68.5	29	19	0.00	0.0	0
2019-08-18	75	63	69.0	29	19	0.00	0.0	0
2019-08-19	79	65	72.0	32	22	0.00	0.0	0
2019-08-20	81	64	72.5	33	23	0.00	0.0	0
2019-08-21	82	63	72.5	33	23	0.00	0.0	0
2019-08-22	73	62	67.5	28	18	0.00	0.0	0
2019-08-23	77	63	70.0	30	20	0.00	0.0	0
2019-08-24	82	63	72.5	33	23	0.00	0.0	0
2019-08-25	91	66	78.5	39	29	0.00	0.0	0
2019-08-26	88	69	78.5	39	29	0.00	0.0	0
2019-08-27	83	67	75.0	35	25	0.00	0.0	0
2019-08-28	77	66	71.5	32	22	0.00	0.0	0
2019-08-29	81	66	73.5	34	24	0.00	0.0	0
2019-08-30	84	66	75.0	35	25	0.00	0.0	0
2019-08-31	86	68	77.0	37	27	0.00	0.0	0
Average|Sum	80.1	64.0	72.0	1002	692	0.00	0.0	0.0

Attachment 2: Table 7

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - September 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-09-01	83	67	75.0	35	25	0.00	0.0	0
2019-09-02	88	68	78.0	38	28	0.00	0.0	0
2019-09-03	88	72	80.0	40	30	0.00	0.0	0
2019-09-04	91	72	81.5	42	32	0.01	0.0	0
2019-09-05	88	71	79.5	40	30	0.00	0.0	0
2019-09-06	90	69	79.5	40	30	0.00	0.0	0
2019-09-07	86	67	76.5	37	27	0.00	0.0	0
2019-09-08	76	64	70.0	30	20	0.00	0.0	0
2019-09-09	75	64	69.5	30	20	0.00	0.0	0
2019-09-10	75	64	69.5	30	20	0.00	0.0	0
2019-09-11	78	65	71.5	32	22	0.00	0.0	0
2019-09-12	81	61	71.0	31	21	0.00	0.0	0
2019-09-13	89	64	76.5	37	27	0.00	0.0	0
2019-09-14	94	65	79.5	40	30	0.00	0.0	0
2019-09-15	93	65	79.0	39	29	0.00	0.0	0
2019-09-16	82	67	74.5	35	25	0.00	0.0	0
2019-09-17	81	64	72.5	33	23	0.00	0.0	0
2019-09-18	77	60	68.5	29	19	0.00	0.0	0
2019-09-19	75	61	68.0	28	18	0.00	0.0	0
2019-09-20	77	58	67.5	28	18	0.00	0.0	0
2019-09-21	81	61	71.0	31	21	0.00	0.0	0
2019-09-22	84	60	72.0	32	22	0.00	0.0	0
2019-09-23	78	61	69.5	30	20	0.00	0.0	0
2019-09-24	84	59	71.5	32	22	0.00	0.0	0
2019-09-25	76	66	71.0	31	21	T	0.0	0
2019-09-26	74	68	71.0	31	21	0.00	0.0	0
2019-09-27	73	67	70.0	30	20	0.00	0.0	0
2019-09-28	72	63	67.5	28	18	0.05	0.0	0
2019-09-29	71	58	64.5	25	15	0.00	0.0	0
2019-09-30	74	52	63.0	23	13	0.00	0.0	0
Average|Sum	81.1	64.1	72.6	987	687	0.06	0.0	0.0

Attachment 2: Table 8

Climatological Data for SAN DIEGO MONTGOMERY FIELD, CA - October 2019

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-10-01	72	54	63.0	23	13	0.00	0.0	0
2019-10-02	76	53	64.5	25	15	0.00	0.0	0
2019-10-03	76	55	65.5	26	16	0.00	0.0	0
2019-10-04	79	53	66.0	26	16	0.00	0.0	0
2019-10-05	81	53	67.0	27	17	0.00	0.0	0
2019-10-06	87	55	71.0	31	21	0.00	0.0	0
2019-10-07	87	57	72.0	32	22	0.00	0.0	0
2019-10-08	84	56	70.0	30	20	0.00	0.0	0
2019-10-09	73	63	68.0	28	18	0.00	0.0	0
2019-10-10	75	59	67.0	27	17	0.00	0.0	0
2019-10-11	87	55	71.0	31	21	0.00	0.0	0
2019-10-12	80	53	66.5	27	17	0.00	0.0	0
2019-10-13	75	61	68.0	28	18	0.00	0.0	0
2019-10-14	73	60	66.5	27	17	0.00	0.0	0
2019-10-15	80	55	67.5	28	18	0.00	0.0	0
2019-10-16	84	60	72.0	32	22	0.00	0.0	0
2019-10-17	74	63	68.5	29	19	0.00	0.0	0
2019-10-18	77	57	67.0	27	17	0.00	0.0	0
2019-10-19	81	56	68.5	29	19	0.00	0.0	0
2019-10-20	80	54	67.0	27	17	0.00	0.0	0
2019-10-21	91	57	74.0	34	24	0.00	0.0	0
2019-10-22	97	62	79.5	40	30	0.00	0.0	0
2019-10-23	88	61	74.5	35	25	0.00	0.0	0
2019-10-24	96	60	78.0	38	28	0.00	0.0	0
2019-10-25	91	61	76.0	36	26	0.00	0.0	0
2019-10-26	87	59	73.0	33	23	0.00	0.0	0
2019-10-27	68	57	62.5	23	13	0.00	0.0	0
2019-10-28	77	52	64.5	25	15	0.00	0.0	0
2019-10-29	71	49	60.0	20	10	0.00	0.0	0
2019-10-30	80	50	65.0	25	15	0.00	0.0	0
2019-10-31	78	44	61.0	21	11	0.00	0.0	0
Average|Sum	80.8	56.3	68.5	890	580	0.00	0.0	0.0

Attachment 2: Table 9 Summary of Jurisdictional Waters	
Jurisdiction	Area (linear feet)
Waters of the U.S. – USACE	
Vernal pools	0.164 ac
Wetland (swale)	0.023 ac
Non-wetland Water (culvert)	24 sq. ft. (15.5)
Total Waters of the U.S.	**0.187 ac (15.5)**
Waters of the State – RWQCB	
Vernal pools	0.164 ac
Wetland (swale)	0.023 ac
Non-wetland Water (culvert)	24 sq. ft. (15.5)
Total Waters of the State – RWQCB	**0.187 ac (15.5)**
City of San Diego Wetlands	
Vernal pools	0.164 ac
Wetland (swale)	0.023 ac
Total City of San Diego Waters	**0.187 ac (15.5)**

Attachment 2: Table 10 List of Aquatic Resources									
Waters ID	Cowardin Code	HGM Code	Area (Sq. Ft)	Linear Feet	Waters Type	Latitude (dd NAD83)	Longitude (dd NAD83)	Local Waterway	Dominant Vegetation
WDP 1	P	Depress	1381	--	Isolate	32.81788651770	-117.13557392600	Depression	Lythrum hyssopifolia
WDP 2	P	Depress	104	--	Isolate	32.81813787510	-117.13526848500	Depression	Lythrum hyssopifolia
WDP 3	P	Depress	1211	--	Isolate	32.81816850630	-117.13479181100	Depression	Psilocarphus brevissimus
WDP 4	P	Depress	587	--	Isolate	32.81804586220	-117.13542924100	Depression	Lythrum hyssopifolia
WDP 5	P	Depress	501	--	Isolate	32.81824660260	-117.13470848300	Depression	Psilocarphus brevissimus
WDP 6	P	Depress	71	--	Isolate	32.81842640010	-117.13467545600	Depression	Lythrum hyssopifolia
WDP 7	P	Depress	644	--	Isolate	32.81859580850	-117.13451168800	Depression	Lythrum hyssopifolia
WDP 8	P	Depress	1238	--	Isolate	32.81859086300	-117.13459745300	Depression	Psilocarphus brevissimus
WDP 9	P	Depress	88	--	Isolate	32.81878000080	-117.13534626000	Depression	Psilocarphus brevissimus
WDP 10	P	Depress	53	--	Isolate	32.81878865810	-117.13526933300	Depression	Psilocarphus brevissimus
WDP 11	P	Depress	143	--	Isolate	32.81803285540	-117.13486054600	Depression	Psilocarphus brevissimus
WDP 12	R	Riverine	1195	--	NRPW	32.81746897750	-117.13497485800	Riverine	Lythrum hyssopifolia
13	P	Depress	1217	--	Isolate	32.81891223	-117.13524099	Depression	unknown (not sampled)
14	P	Depress	3218	--	Isolate	32.81795266	-117.13440880	Depression	unknown (not sampled)
15	P	Depress	715	--	Isolate	32.81759730	-117.13484744	Depression	unknown (not sampled)
16	P	Depress	396	--	Isolate	32.81718727	-117.13479255	Depression	unknown (not sampled)
17	R	Riverine	24	15.5	NRPW	32.81946200000	-117.13307200000	Riverine	unknown (not sampled)
P = Palustrine; HGM = hydrogeomorphic									

ATTACHMENT 3

Jurisdictional Waters Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: July 17, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 1

Investigator(s): Andrew Smisek, Karyl Field Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135577422 Long: 32.8178077472 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 x	Is the Sampled Area within a Wetland? Yes ___ No x
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No x	

Remarks:
Paired point to WDP1 occurring in upload just outside WDP1 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1. *None*			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1. *None*			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Bromus madritensis*	30	Y	FACU
2. *Festuca myuros*	10	N	UPL
3. *Erodium sp*	10	N	FACU
4. *Deinandra fasciculata*	5	N	FACU
5. *Gazania linearis*	1	N	UPL
6.			
7.			
8.			
	46	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1. *None*			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	3	x 4 =	12
UPL species	2	x 5 =	10
Column Totals:	5 (A)		22 (B)

Prevalence Index = B/A = 4.4

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 x

Remarks: Vegetation has been recently mowed (possibly today).

SOIL

Sampling Point: UDP 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
0-1								lots of organic debris
1-7	7.5YR 4/3	93	7.5YR 5/8	7	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compacted soil

Depth (inches): 7

Hydric Soil Present? Yes ______ No X

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): ________

Water Table Present? Yes _____ No x Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): ________

Wetland Hydrology Present? Yes ______ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: July 17, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 1

Investigator(s): Andrew Smisek, Karyl Field Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135573926 Long: 32.8178865177 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation x, Soil ___, or Hydrology ___ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ___ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 x	No ___	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ___
Hydric Soil Present?	Yes x	No ___		
Wetland Hydrology Present?	Yes x	No ___		

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1. *None*			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1. *None*			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Lythrum hyssopifolia*	40	Y	OBL
2. *Psilocarphus brevissimus*	5	N	FACW
3. *Dittrichia graveolens*	1	N	UPL
4.			
5.			
6.			
7.			
8.			
	46	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1. *None*			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

x 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 x No ___

Remarks:
Vegetation has been recently mowed (possibly today).
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 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
0-1	7.5YR 3/1				RM	M	sandy loam	lots of organic debris
1-7	7.5YR 4/2	95	7.5YR 5/8	5	C	PL & M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_x_ 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: ______
Depth (inches): ______

Hydric Soil Present? Yes _x_ No ___

Remarks: redox features obvious and observed throughout 1-7 inch layer. Only dug 7 inches due to vernal pool sensitivity.

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)
_x_ Biotic Crust (B12)
_x_ 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)

<u>Secondary Indicators (2 or more required)</u>

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _x_ Depth (inches): ______
Water Table Present? Yes ___ No _x_ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No _x_ Depth (inches): ______

Wetland Hydrology Present? Yes _x_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.
Known presence of San Diego fairy shrimp

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 2

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135292364 Long: 32.8181105697 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:
Paired point to WDP2 occurring in upload just outside WDP2 depression.
Section, Township, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Bromus madritensis*	30	Yes	FACU
2. *Erodium sp*	50	Yes	FACU
3. *Dittrichia graveolens*	1	No	NI
4. *Gazania linearis*	5	No	NI
5. *Croton setiger*	1	No	NI
6.			
7.			
8.			
	87	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

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 X

Remarks: Vegetation has been mowed.

SOIL

Sampling Point: UDP 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
0-6	5YR 3/3	70	5YR 4/6	10	C	M	Sandy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compacted soil

Depth (inches): 6

Hydric Soil Present? Yes ___ No x

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: July 17, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 2

Investigator(s): Andrew Smisek, Karyl Field Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135268485 Long: 32.8181378751 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 x No ____	**Is the Sampled Area within a Wetland?** **Yes** x **No** ____
Hydric Soil Present?	Yes x No ____	
Wetland Hydrology Present?	Yes x No ____	

Remarks: Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *None*			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Lythrum hyssopifolia*	30	Y	OBL
2. *Psilocarphus brevissimus*	10	N	FACU
3. *Deinandra fasciculata*	10	N	FACW
4. *Bromus madritensis*	1	N	FACU
5.			
6.			
7.			
8.			
	51	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. *None*			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

x 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 x No ____

Remarks: Vernal pool indicator species present.

SOIL

Sampling Point: WDP 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
0-6	5YR 3/3	70	5YR 4/6	20	C	M	sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
- X 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: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ___

Remarks: Many redox features throughout. Only dug 6 inches due to vernal pool sensitivity.

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**)
- x 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)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ______

Water Table Present? Yes ___ No x Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): ______

Wetland Hydrology Present? Yes x No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil cracking observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 3

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134842675 Long: 32.8182494581 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

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

Remarks:
Paired point to WDP3 occurring in upload just outside WDP3 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. *Erodium sp.*	50	Yes	FACU
2. *Bromus madritensis*	30	Yes	FACU
3. *Gazania linearis*	5	No	NI
4. *Lofia gallica*	1	No	NI
5. *Croton setiger*	1	No	NI
6.			
7.			
8.			
= Total Cover	87		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

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 X

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: UDP 3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	5YR 3/3						sandy loam	
4-8	2.5YR 3/4	70	2.5YR 4/8	5	C	M	clay	redox features present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compacted soil

Depth (inches): 8

Hydric Soil Present? Yes ______ No X

Remarks: Redox features in the clay 4-8 inch layer very small but distinguishable. Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): ____________
Water Table Present? Yes _____ No X Depth (inches): ____________
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: July 17, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 3

Investigator(s): Andrew Smisek, Karyl Field Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134791811 Long: 32.8181685063 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Palustrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes x No ____	
Wetland Hydrology Present?	Yes x No ____	

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1. *None*			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. *None*			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Psilocarphus brevissimus*	40	Y	FACW
2. *Deinandra fasciculata*	5	N	FACU
3. *Holicarpha virgata*	1	N	UPL
4.			
5.			
6.			
7.			
8.			
	46	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. *None*			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust 70

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 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 X No ____

Remarks: Vegetation has been recently mowed (possibly today).
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 3/2	80	5YR 4/6	20	C	M	sandy loam	
5-7	2.5YR 3/6	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_x_ 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: ______________
Depth (inches): ______________

Hydric Soil Present? Yes _x_ No ___

Remarks: redox features obvious and observed throughout 0-5 inch layer. Only dug 7 inches due to vernal pool sensitivity.

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)
_x_ Biotic Crust (B12)
_x_ 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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No _x_	Depth (inches): ______
Water Table Present?	Yes ___	No _x_	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No _x_	Depth (inches): ______

Wetland Hydrology Present? Yes _x_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Algal crusts consitent throughout. Known presence of San Diego fairy shrimp .

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 4

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135469055 Long: 32.8180743603 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:
Paired point to WDP4 occurring in upload just outside WDP4 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Erodium sp.*	50	Yes	FACU
2. *Bromus madritensis*	20	Yes	FACU
3. *Deinandra fasciculata*	5	No	FACU
4. *Croton setiger*	5	No	NI
5.			
6.			
7.			
8.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

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 X

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: UDP 4

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
0-8	5YR 3/3	70	2.5YR 3/6	5	C	M	sandy clay loam	much gravel throughout

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compacted soil

Depth (inches): 8

Hydric Soil Present? Yes ______ No X

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____________
Water Table Present? Yes _____ No X Depth (inches): _____________
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 4

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135429241 Long: 32.8180458622 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	No	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X	No		
Wetland Hydrology Present?	Yes X	No		

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Lythrum hyssopifolia*	35	Yes	OBL
2. *Euphorbia maculata*	15	Yes	UPL
3. *Deinandra fasciculata*	5	No	FACU
4. *Psilocarphus brevissimus*	5	No	FACW
5.			
6.			
7.			
8.			
	60	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	5	x 2 =	10
FAC species		x 3 =	
FACU species	5	x 4 =	20
UPL species	15	x 5 =	75
Column Totals:	60 (A)		140 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%
X 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 X No ____

Remarks: Vegetation has been recently mowed (possibly today).
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 4

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
0-6	5YR 3/3	85	5YR 4/6	15	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
X 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: ______
Depth (inches): ______

Hydric Soil Present? Yes X No ______

Remarks: Many redox features observed. Only dug 6 inches due to vernal pool sensitivity.

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)
X Biotic Crust (B12)
X 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)
___ Thin Muck Surface (C7)
___ 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): ______
Water Table Present? Yes ____ No ____ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Biotic crusts observed throughout vernal pool depression
Known presence of San Diego fairy shrimp.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP5

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134741589 Long: 32.8182598933 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

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

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

Remarks:
Paired point to WDP5 occurring in upload just outside WDP5 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ___)			
1. *Erodium sp.*	30	Yes	FACU
2. *Bromus madritensis*	30	Yes	FACU
3. *Lythrum hyssopifolium*	10	No	OBL
4. *Deinandra fasciculata*	5	No	FACU
5.			
6.			
7.			
8.			
= Total Cover	75		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

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 X

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: UDP 5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5YR 3/2	70	5YR 4/6	20	C	M	sandy clay loam	gravel mixed in

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil
Depth (inches): 8

Hydric Soil Present? Yes ___ No X

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 5

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134708483 Long: 32.8182466026 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Psilocarphus brevissimus*	20	Yes	FACW
2. *Deinandra fasciculata*	15	Yes	FACU
3. *Dittrichia graveolens*	10	Yes	NI
4. *Lythrum hyssopifolium*	5	No	OBL
5.			
6.			
7.			
8.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

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	5	x 1 =	5
FACW species	20	x 2 =	40
FAC species		x 3 =	
FACU species	15	x 4 =	60
UPL species	10	x 5 =	50
Column Totals:	50 (A)		155 (B)

Prevalence Index = B/A = 3.1

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)
X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: Although vegetation doesn't meet the hydrophytic vegetation standard via the dominance test or prevalence index, it is still considered to meet the hydrophyticstandard as problematic due to the active management of vegetation here. Mowing appears to occur frequently for airport maintenance purposes which may alter the vegetation away from naturally hydrophytic conditions.
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 3/3	70	2.5YR 3/6	10	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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 rock

Depth (inches): 3

Hydric Soil Present? Yes _X_ No ___

Remarks: redox features observed throughout sample

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)
_X_ Biotic Crust (B12)
_X_ 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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _X_ Depth (inches): ______
Water Table Present? Yes ___ No _X_ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No _X_ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: biotic crusts scattered throughout vernal pool depression
Known presence of San Diego fairy shrimp.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 6

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134710554 Long: 32.8184234723 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Paired point to WDP6 occurring in upload just outside WDP6 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Bromus madritensis*	40	Yes	FACU
2. *Erodium sp.*	25	Yes	FACU
3. *Holocarpha virgata*	5	No	NI
4. *Dittrichia graveolens*	5	No	UPL
5.			
6.			
7.			
8.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

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 X

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: UDP 6

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 %	Type[1]	Loc[2]	Texture	Remarks
0-8	5YR 3/3	60	5YR 4/6	5	C	M	sandy clay loam	gravel present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil

Depth (inches): 8

Hydric Soil Present? Yes ____ No X

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 6

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134675456 Long: 32.8184264001 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Phalaris lemmonii*	20	Yes	FACW
2. *Lythrum hyssopifolia*	20	Yes	OBL
3. *Holocarpha virgata*	20	Yes	NI
4. *Dittrichia graveolens*	10	No	UPL
5.			
6.			
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 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 X No ____

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: WDP 6

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	5YR 3/3	70	5YR 4/6	20	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______
Depth (inches): ______

Hydric Soil Present? Yes _X_ No ___

Remarks: Redox features obvious and presernt throughout sample. Only dug 2 inches due to vernal pool sensitivity.

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)
_X_ Biotic Crust (B12)
_X_ 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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _X_ Depth (inches): ______
Water Table Present? Yes ___ No _X_ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No _X_ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.
Known presence of San Diego fairy shrimp

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 7

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134542336 Long: 32.8186025684 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X		
Wetland Hydrology Present?	Yes ___	No X		

Remarks: Paired point to WDP7 occurring just outside WDP7 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Bromus madritensis*	50	Yes	FACU
2. *Deinandra fasciculata*	5	No	FACU
3. *Dittrichia graveolens*	5	No	UPL
4. *Lythrum hyssopifolium*	1	No	OBL
5. *Psilocarphus brevissimus*	1	No	FACW
6.			
7.			
8.			
	62	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

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 X

Remarks: Vegetation has been recently mowed. Although Lythrum hyssopifolium and vernal pool indicator species, Psilocarphus brevissimus, are present, these species are scattered locally in this upland area sampled.

SOIL

Sampling Point: UDP 7

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 %	Type[1]	Loc[2]	Texture	Remarks
0-8	5RY 3/3	80	5YR 4/6	15	C	M	sandy clay loam	some gravel and organics mixed in

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil

Depth (inches): 8

Hydric Soil Present? Yes ______ No __X__

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No __X__ Depth (inches): ______
Water Table Present? Yes _____ No __X__ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes _____ No __X__ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No __X__

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 7

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134511688 Long: 32.8185958085 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.
Known presence of San Diego fairy shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Lythrum hyssopifolia*	20	Yes	OBL
2. *Bromus madritensis*	20	Yes	FACU
3. *Juncus bufonius*	15	Yes	FACW
4. *Dittrichia graveolens*	15	Yes	UPL
5. *Phalaris lemmonii*	12	No	FACW
6. *Deinandra fasciculata*	5	No	FACU
7. *Holocarpha virgata*	5	No	NI
8.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	27	x 2 =	54
FAC species		x 3 =	
FACU species	25	x 4 =	100
UPL species	20	x 5 =	100
Column Totals:	92 (A)		174 (B)

Prevalence Index = B/A = 1.9

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
X 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 X No ___

Remarks: Vegetation has been recently mowed.
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 7

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
0-2	5YR 3/2	70	5YR 4/6	20	C	RC	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______

Depth (inches): ______

Hydric Soil Present? Yes _X_ No ___

Remarks: redox features obvious and observed throughout sample. Only dug 2 inches due to vernal pool sensitivity.

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)
_X_ Biotic Crust (B12)
_X_ 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)
___ Thin Muck Surface (C7)
___ 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): ______
Water Table Present? Yes ___ No ___ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.
Known presence of San Diego fairy shrimp

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 8

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.13463011 Long: 32.8186188328 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks: Paired point to WDP8 occurring in upload just outside WDP8 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Bromus madritensis*	50	Yes	FACU
2. *Deinandra fasciculata*	10	No	FACU
3. *Dittrichia graveolens*	5	No	UPL
4. *Lythrum hyssopifolium*	2	No	OBL
5.			
6.			
7.			
8.			
	67	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

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 X

Remarks: Vegetation has been recently mowed.

SOIL

Sampling Point: UDP 8

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 3/3	75	5YR 4/6	15	C	M	sandy clay loam	some gravel mixed in and organics at surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil

Depth (inches): 3

Hydric Soil Present? Yes ___ No X

Remarks: Soils at this sample point would meet the criteria for Redox Depressions (F8) if this location occurred in a depressional landform. Redox features may be present due to hardpan subsurface that minmizes drainage of this area and likely causes prolonged saturation during the rainy season.

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 8

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134597453 Long: 32.818590863 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. *Psilocarphus brevissimus*	30	Yes	FACW
2. *Lythrum hyssopifolia*	10	Yes	OBL
3. *Dittrichia graveolens*	10	Yes	UPL
4. *Deinandra fasciculata*	3	No	FACU
5.			
6.			
7.			
8.			
= Total Cover	53		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	67	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- X 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 X No ____

Remarks: Vegetation has been recently mowed.
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 8

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 %	Type[1]	Loc[2]	Texture	Remarks
0-2	5YR 3/2	70	5YR 4/6	25	C	M	Sandy clay loam	organics at surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______
Depth (inches): ______

Hydric Soil Present? Yes _X_ No ___

Remarks: Redox features obvious and observed throughout sample. Only dug 2 inches due to vernal pool sensitivity.

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)
_X_ Biotic Crust (B12)
_X_ 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)
___ Thin Muck Surface (C7)
___ 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): ______
Water Table Present? Yes ___ No ___ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.
Known presence of San Diego fairy shrimp.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 9/10

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.135279773 Long: 32.8187663103 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Paired point to WDP9 and WDP10 occurring between the WDP9 and WDP10 depressions in an area where gravel has been laid for an access road. Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Bromus madritensis*	50	Yes	FACU
2. *Deinandra fasciculata*	10	No	FACU
3. *Dittrichia graveolens*	5	No	UPL
4. *Pennisetum setaceum*	5	No	NI
5.			
6.			
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

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 X

Remarks: Vegetation has been recently mowed.

SOIL

Sampling Point: UDP 9/10

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
0-3	7.5YR 4/3	100					sandy clay loam	much gravel mixed in
3-8	7.5YR 3/3	95					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil

Depth (inches): 8

Hydric Soil Present? Yes ___ No X

Remarks: no redox features observed

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 9

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.13534626 Long: 32.8187800008 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Sample point occurs in a small depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Psilocarphus brevissimus*	20	Yes	FACW
2. *Lythrum hyssopifolia*	10	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

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 X No ____

Remarks: Vegetation has been recently mowed.
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 9

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 3/2	70	2.5YR 3/6	15	C	M	sandy clay loam	some gravel on surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______________
Depth (inches): ______________

Hydric Soil Present? Yes _X_ No ___

Remarks: Redox features obvious and observed throughout sample. Only dug 3 inches due to vernal pool sensitivity.

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)
_X_ 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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ___ No _X_ Depth (inches): ______
Water Table Present? Yes ___ No _X_ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No _X_ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 10

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: 117.135269333 Long: 32.8187886581 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation X, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (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 X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: Sample point occurs in a small depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. *Psilocarphus brevissimus*	20	Yes	FACW
2. *Lythrum hyssopifolia*	10	Yes	OBL
3. *Dittrichia graveolens*	5	No	UPL
4.			
5.			
6.			
7.			
8.			
	35	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	___	x 1 = ___
FACW species	___	x 2 = ___
FAC species	___	x 3 = ___
FACU species	___	x 4 = ___
UPL species	___	x 5 = ___
Column Totals:	___ (A)	___ (B)

Prevalence Index = B/A = ___

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 X No ___

Remarks: Vegetation has been recently mowed.
Vernal pool indicator specicies present.

SOIL

Sampling Point: WDP 10

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 %	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 3/2	70	2.5YR 3/6	15	C	M	sandy clay loam	some gravel on surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______

Depth (inches): ______

Hydric Soil Present? Yes _X_ No ___

Remarks: Redox features obvious and observed throughout sample. Only dug 3 inches due to vernal pool sensitivity.

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)
_X_ 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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _X_ Depth (inches): ______
Water Table Present? Yes ___ No _X_ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No _X_ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 11

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134923912 Long: 32.8180422736 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Paired point to WDP11 occurring in upload just outside WDP11 depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Bromus madritensis*	15	Yes	UPL
2. *Erodium sp.*	15	Yes	FACU
3. *Deinandra fasciculata*	10	Yes	FACU
4. *Dittrichia graveolens*	5	No	UPL
5. *Holocarpha virgata*	1	No	NI
6.			
7.			
8.			
	46	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

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 X

Remarks: Vegetation has been recently mowed

SOIL

Sampling Point: UDP 11

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
0-5	7.5YR 3/3	100					sandy clay loam	no redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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 rock/compact soil

Depth (inches): 5

Hydric Soil Present? Yes ___ No X

Remarks: no redox features observed

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 11

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134860546 Long: 32.8180328554 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Sample point occurs in a known vernal pool depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.
Known presence of San Diego Fairy Shrimp

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Psilocarphus brevissimus*	10	Yes	FACW
2. *Deinandra fasciculata*	10	Yes	FACU
3. *Dittrichia graveolens*	5	Yes	UPL
4. *Erodium sp.*	1	No	FACU
5. *Holocarpha virgata*	1	No	NI
6.			
7.			
8.			
		= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

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 ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

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)
X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Although vegetation doesn't meet the hydrophytic vegetation standard via the dominance test or prevalence index, it is still considered to meet the hydrophyticstandard as problematic due to the active management of vegetation here. Mowing appears to occur frequently for airport maintenance purposes which may alter the vegetation away from naturally hydrophytic conditions.
Vernal pool indicator speciecies present.

SOIL

Sampling Point: WDP 11

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
0-2	5YR 3/2	70	2.5Yr 3/6	25	C	M	sandy clay loam	organics at surface

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
_X_ 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: ______
Depth (inches): ______

Hydric Soil Present? Yes _X_ No ___

Remarks: Redox features obvious and observed throughout sample. Only dug 2 inches due to vernal pool sensitivity.

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)
_X_ Biotic Crust (B12)
_X_ 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)
___ Thin Muck Surface (C7)
___ 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): ______
Water Table Present? Yes ___ No ___ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ______

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dried biotic crust observed throughout pool.
Known presence of San Diego fairy shrimp.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: UDP 12

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): upland Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134971254 Long: 32.817428241 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

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

Remarks: Paired point to WDP12 occurring in upload just outside WDP12 swale.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1. *Eriogonum fasciculatum*	25	Yes	NI
2. *Acmispon glaber*	10	Yes	NI
3. *Baccharis sarothroides*	5	No	FACU
4.			
5.			
= Total Cover	40		
Herb Stratum (Plot size: ____)			
1. *Bromus madritensis*	20	Yes	UPL
2. *Logfia gallica*	10	Yes	NI
3. *Deinandra fasciculata*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
= Total Cover	40		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

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 X

Remarks: No hydrophytic species presernt

SOIL

Sampling Point: UDP 12

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
0-12	7.5YR 3/3	100					sandy clay loam	no redox features

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks: no hydric soil indicators observed

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)
___ Thin Muck Surface (C7)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______
Water Table Present? Yes ___ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Diego Fire-Rescue Air Operations Hangar City/County: San Diego / San Diego Sampling Date: Nov 1, 2019

Applicant/Owner: City of San Diego State: CA Sampling Point: WDP 12

Investigator(s): Andrew Smisek Section, Township, Range: See Remarks

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR-C Lat: -117.134974858 Long: 32.8174689775 Datum: NAD83

Soil Map Unit Name: Redding gravelly loam (RdC), 2 to 9 percent slopes NWI classification: Paulstrine Emergent Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (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 X	No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks: Sample point occurs in a small swale that appears to remain ponded after rain events and functions as a depression.
Section, Touwnship, Range: unsectioned portion of the Mission San Diego landgrant on the La Mesa and La Jolla quadrangles.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ____)			
1. *Lythrum hyssopifolia*	25	Yes	OBL
2. *Cyperus eragrostis*	20	Yes	FACW
3. *Pennisetum setaceum*	10	No	NI
4. *Deinandra fasciculata*	5	No	FACU
5. *Juncus bufonius*	5	No	FACW
6. *Avena sp.*	5	No	NI
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X 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 X No ____

Remarks: Vegetation meets hydrophytic standard. most species dry and dessicated during survey.

SOIL

Sampling Point: WDP 12

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5YR 3/2	90	5YR 4/6	5	C	M	sandy clay	cobble mixed in

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, 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)
X 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 rock/compact soil
Depth (inches): 8

Hydric Soil Present? Yes X No ___

Remarks: redox features observed throughout sample soil

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**)
X 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)
X 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)
___ Thin Muck Surface (C7)
___ 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): ___
Water Table Present? Yes ___ No ___ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

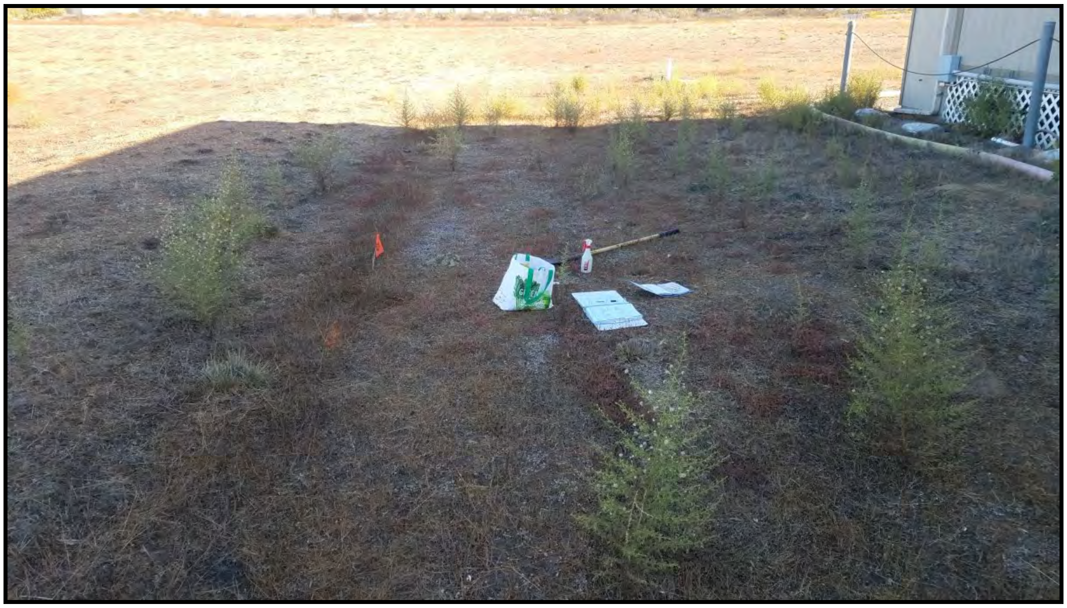
Remarks: This swale may convey flowing water during rain events, but the topography indicates that it likely functions as a depression by holding water for extended periods after rain events. Non-riverine sediment deposits observed along margins of depression, biotic crust observed at bottom of depression.

ATTACHMENT 4

Ground Level Color Photographs

PHOTOGRAPH 1
View of Project Area, Facing Northeast
Photo Date: July 17, 2019

PHOTOGRAPH 2
View of Project Area, Facing Northwest
Photo Date: July 17, 2019



PHOTOGRAPH 3
View of Vernal Pool in Central Portion of Project Area,
Photopoint 3, Facing North
Photo Date: November 1, 2019

PHOTOGRAPH 4
View of Vernal Pool in Eastern Portion of Project Area,
Photopoint 4, Facing Southwest
Photo Date: November 1, 2019

PHOTOGRAPH 5
View of Northeastern Portion of Project Area,
Photopoint 5, Facing Northeast
Photo Date: November 1, 2019

PHOTOGRAPH 6
View of Vernal Pool in Northeastern Portion of Project Area,
Photopoint 6, Facing Northeast
Photo Date: November 1, 2019

PHOTOGRAPH 7
View of Vernal Pool in Northeastern Portion of Project Area,
Photopoint 7, Facing Southwest
Photo Date: November 1, 2019

PHOTOGRAPH 8
View of Swale in East-Central Portion of Project Area,
Photopoint 7, Facing West
Photo Date: November 1, 2019

ATTACHMENT 5

References Cited

References Cited

Jepson Flora Project (eds.)
2019 *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/. Accessed November.

Lichvar, R. W., M. Butterwick, W. N. Kirchner, and N. C. Melvin
2016 *The National Wetland Plant List*: 2016 Wetland Ratings. Phytoneuron 2016-30:1-17. Published 28 April 2016. ISSN 2153 733X.

Natural Resource Conservation Service (NRCS)
2014 San Diego County Hydric Soils.

San Diego Association of Governments (SANDAG)
1995 Soil Series GIS Data. Data digitized from USDA–1973. Soil Survey, San Diego area. Obtained from http://www.sandag.org/resources/maps_and_gis/ gis_downloads/senlu.asp.

U.S. Army Corps of Engineers (USACE)
1987 Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, Department of the Army. January.

1997 Regional General Conditions to the Nationwide Permits – Vernal Pool Indicator Species List. Los Angeles District South Pacific Division. November.

2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. September.

U.S. Department of Agriculture (USDA)
1973 *Soil Survey, San Diego Area, California*. Soil Conservation Service and Forest Service. Roy H. Bowman, ed. San Diego. December.

U.S. Fish and Wildlife Service (USFWS)
2019 National Wetlands Inventory. https://www.fws.gov/wetlands/.

U.S. Geological Survey
1975 7.5-minute topographic map, La Mesa, California quadrangle.

1996 7.5-minute topographic map, La Jolla, California quadrangle.

APPENDIX G

Storm Water Quality Management Plan

This page intentionally left blank

Priority Development Project (PDP)
Storm Water Quality Management Plan (SWQMP)

San Diego Fire Rescue Air Facility

[Insert Permit Application Number]

Project Number

☐ **Check if electing for offsite alternative compliance**

Engineer of Work:

BRIAN SAULL, PE– CA PE Lic. No. 85161

Provide Wet Signature and Stamp Above Line

Prepared For:

City of San Diego

1222 First Ave

San Diego, CA 92101

[Insert Applicant Phone Number]

Prepared By:

C & S Companies
2355 Northside Drive, Suite 350
San Diego, CA 92108
619 296-9373

Date:

Original: 11/05/2018; 1/25/2019

Approved by: City of San Diego   Date

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Table of Contents

- Attachment 3: Structural BMP Maintenance Plan
    - Maintenance Agreement (Form DS-3247) (when applicable)
- Attachment 4: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 5: Project's Drainage Report
- Attachment 6: Project's Geotechnical and Groundwater Investigation Report

Acronyms

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

Certification Page

Project Name:
Permit Application

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

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

Brian C Saull

Engineer of Work's Signature

85161

PE#

03-31-20

Expiration Date

Brian Saull

Print Name

C&S Companies

Company

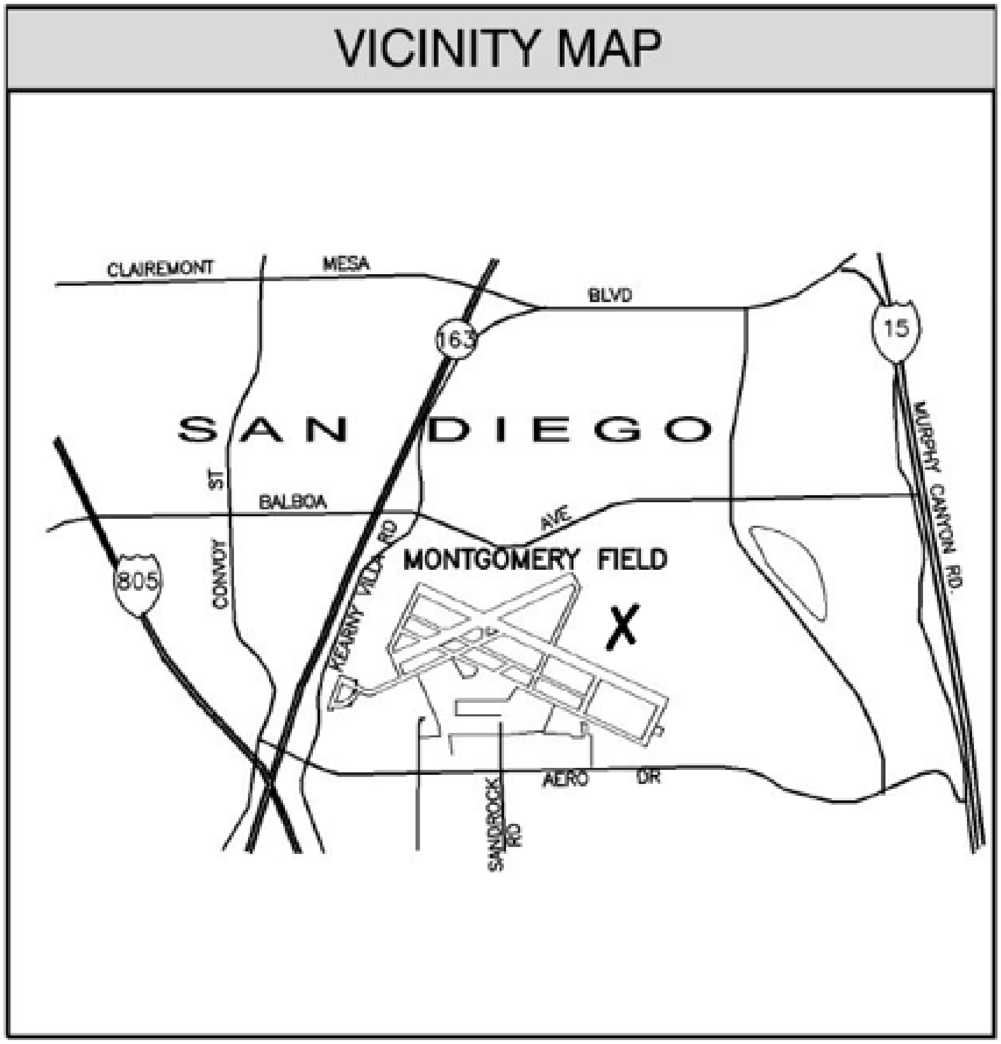
11/1/2019

Date

Engineer's Stamp

Project Vicinity Map

Project Name: San Diego Fire Rescue Air Facility - Montgomery Airport
Permit Application



Submittal Record

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

Submittal Number	Date	Project Status	Changes
1	11-03-2018	☑ Preliminary Design/Planning/CEQA ☐ Final Design	**Initial Submittal**
2		☑ Preliminary Design/Planning/CEQA ☐ Final Design	11/05/2018
3		☑ Preliminary Design/Planning/CEQA ☐ Final Design	01/22/2019
4	11/1/2019	☑ Preliminary Design/Planning/CEQA ☐ Final Design	

City of San Diego Form DS-560 Storm Water Requirements Applicability Checklist

Attach DS-560 form.

City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM
DS-560
November 2018

Project Address:	Project Number:

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Regional Water Quality Control Board.

For all projects complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

☒ Yes; SWPPP required, skip questions 2-4 ☐ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity resulting in ground disturbance and/or contact with storm water?

☐ Yes; WPCP required, skip questions 3-4 ☒ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

☐ Yes; WPCP required, skip question 4 ☒ No; next question

4. Does the project only include the following Permit types listed below?

- Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
- Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
- Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

☒ Yes; no document required

Check one of the boxes below, and continue to PART B:

☒ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

Clear Page 1

PART B: Determine Construction Site Priority

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☐ **ASBS**

a. Projects located in the ASBS watershed.

2. ☐ **High Priority**

a. Projects that qualify as Risk Level 2 or Risk Level 3 per the Construction General Permit (CGP) and not located in the ASBS watershed.

b. Projects that qualify as LUP Type 2 or LUP Type 3 per the CGP and not located in the ASBS watershed.

3. ☒ **Medium Priority**

a. Projects that are not located in an ASBS watershed or designated as a High priority site.

b. Projects that qualify as Risk Level 1 or LUP Type 1 per the CGP and not located in an ASBS watershed.

c. WPCP projects (>5,000sf of ground disturbance) located within the Los Penasquitos watershed management area.

4. ☐ **Low Priority**

a. Projects not subject to a Medium or High site priority designation and are not located in an ASBS watershed.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes ☒ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes ☒ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes ☒ No

Clear Page 2

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. **Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:**
   - **Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;**
   - **Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;**
   - **Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?**

   ☐ Yes; PDP exempt requirements apply ☒ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ☐ Yes; PDP exempt requirements apply ☒ No; project not exempt.

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F and check the box labeled "Priority Development Project".

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☐ Yes ☒ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	☒ Yes ☐ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	☐ Yes ☒ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	☐ Yes ☒ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	☐ Yes ☒ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	☐ Yes ☒ No

Clear Page 3

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).	☐ Yes ☒ No
8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.	☐ Yes ☒ No
9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.	☐ Yes ☒ No
10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces.	☐ Yes ☒ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1.	The project is **NOT SUBJECT TO PERMANENT STORM WATER REQUIREMENTS**.	☐
2.	The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	☐
3.	The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance.	☐
4.	The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management	☒

Kenneth Gethers	Project Engineer
Name of Owner or Agent *(Please Print)*	Title
Kenneth Gethers	11/01/2019
Signature	Date

Clear Page 4

Clear Form

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

<table>
<tr><td colspan="2">Applicability of Permanent, Post-Construction Storm Water BMP Requirements</td><td>Form I-1</td></tr>
<tr><td colspan="3">Project Identification</td></tr>
<tr><td colspan="3">Project Name: San Diego Fire Rescue Air Facility - Montgomery Airport</td></tr>
<tr><td colspan="2">Permit Application Number:</td><td>Date: 01/22/2019</td></tr>
<tr><td colspan="3">Determination of Requirements</td></tr>
<tr><td colspan="3">The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short <u>summary</u> of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.

Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.</td></tr>
<tr><td>Step</td><td>Answer</td><td>Progression</td></tr>
<tr><td rowspan="2">Step 1: Is the project a "development project"? See Section 1.3 of the manual (Part 1 of Storm Water Standards) for guidance.</td><td>☑ Yes</td><td>Go to Step 2.</td></tr>
<tr><td>☐ No</td><td>Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.</td></tr>
<tr><td colspan="3">Discussion / justification if the project is <u>not</u> a "development project" (e.g., the project includes only interior remodels within an existing building):</td></tr>
<tr><td rowspan="3">Step 2: Is the project a Standard Project, PDP, or PDP Exempt?
To answer this item, see Section 1.4 of the manual in its entirety for guidance AND complete Form DS-560, Storm Water Requirements Applicability Checklist.</td><td>☐ Standard Project</td><td>Stop. Standard Project requirements apply</td></tr>
<tr><td>☑ PDP</td><td>PDP requirements apply, including PDP SWQMP. Go to Step 3.</td></tr>
<tr><td>☐ PDP Exempt</td><td>Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.</td></tr>
<tr><td colspan="3">Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</td></tr>
</table>

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Form I-1 Page 2 of 2		
Step	**Answer**	**Progression**
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to **Step 4**.
	☑ No	BMP Design Manual PDP requirements apply. Go to **Step 4**.
Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual (Part 1 of Storm Water Standards) for guidance.	☑ Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to **Step 5**.
	☐ No	**Stop**. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply: All runoff created by new impervious surfaces will be first treated and stored in underground tank and hauled-off after storm event. Therefor no additional flows will be discharged into the vernal pool areas.		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). **Stop**.
	☑ No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. **Stop**.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply: No critical Coarse sediment yield areas exist within the project site, WMAA exhibit within attachment 2b		

HMP Exemption Exhibit

Attach a HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information and exempt waterbody.
Reference applicable drawing number(s).

Exhibit must be provided on 11"x17" or larger paper.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

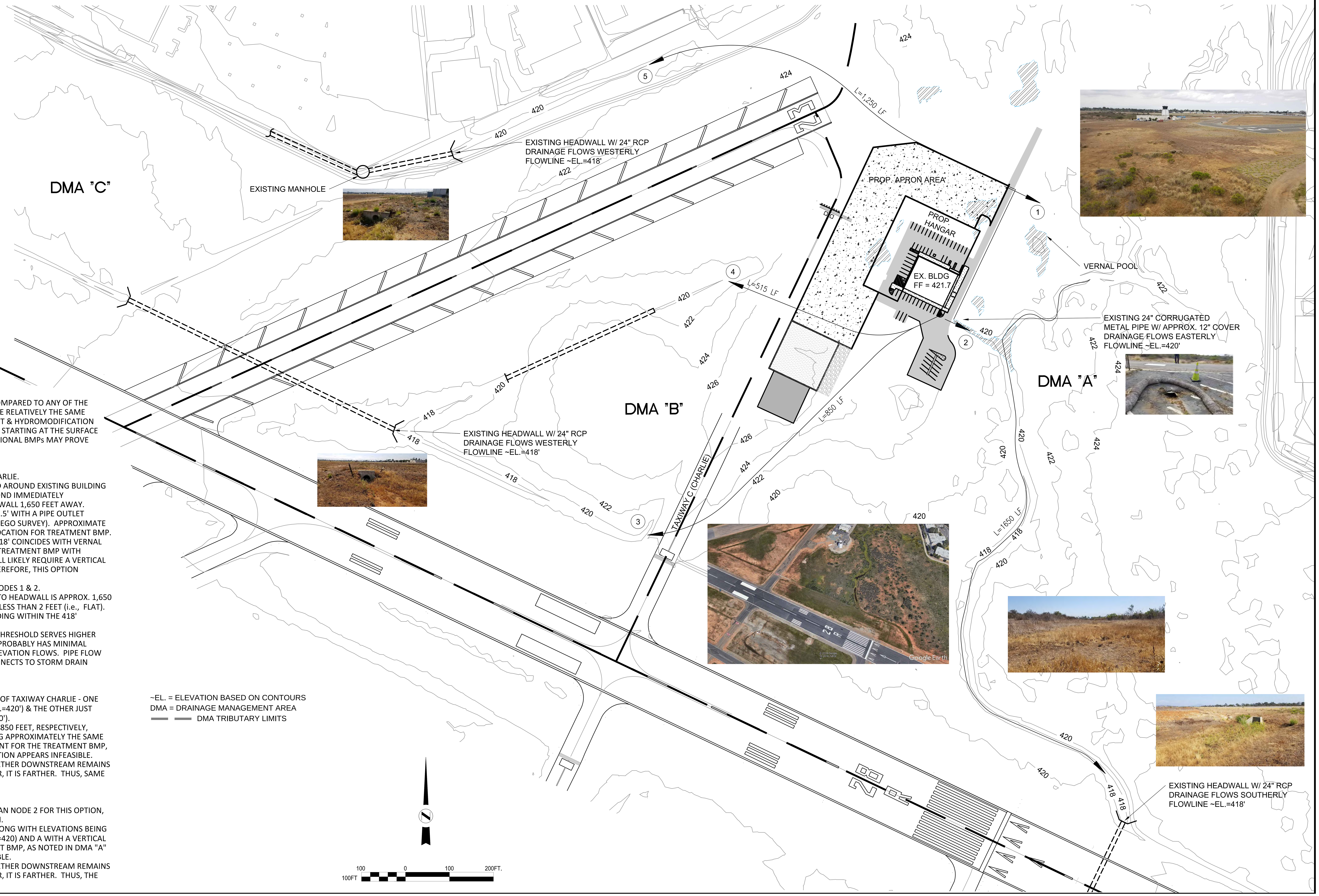
Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	San Diego Fire Rescue Air Facility - Montgomery Airp
Project Address	750 John J Montgomery Dr, San Diego, CA 92123
Assessor's Parcel Number(s) (APN(s))	760-222-32, 760-104-83, 421-030-61
Permit Application Number	
Project Watershed	Select One: ☐ San Dieguito River ☐ Penasquitos ☐ Mission Bay ☑ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Mission San Diego , HSA - 907.11
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	502 Acres (21,867,120 Square Feet)
Area to be disturbed by the project (Project Footprint)	3.19 Acres (139,105 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	2.97 Acres (129,373 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.22 Acres (9,583 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	314.62 %

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☑ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information: The site is an airport facility.
Existing Land Cover Includes (select all that apply): ☑ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☑ Impervious Areas Description / Additional Information:
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☐ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☑ NRCS Type D
Approximate Depth to Groundwater: ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☑ 10 feet < Groundwater Depth < 20 feet ☐ Groundwater Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☑ Wetlands ☐ None Description / Additional Information: There are existing vernal pool south of the proposed improved area but will not be impacted by proposed ground disturbance

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Descriptions/Additional Information
The project's runoff drains to two low points within the ground disturbance area (node 1 and node 2, of attached drainage options exhibit, next page). The southerly watershed (see hydrology map, attachment 5) drains to the northeast into an existing 24" corrugated metal pipe located in the parking lot nearby the most southeasterly corner of the existing building (node 1). This pipe conveys flows underneath the paved surface discharging flows to the east into an existing natural meandering stream that conveys flows to the southeast, to a headwall immediately north of Runway 28R, then off-site further to the south into an existing underground public system within Aero Drive. The northerly watershed drains to the east to a low point located nearby and at the most northeast corner of the existing parking lot. Flows over top the existing paved road and continue southeast into the existing stream. Drainage options were considered, but proved infeasible regardless of the approach due to the following conditions 1. Redirecting flow from either node 1 or node 2 to node 3, 4, or 5 was not possible due to approximately the same field elevations. And since the downstream nodes are either 515 LF, 850 LF, or 1250 LF away, all downstream elevation outlets would end up below grade. Moreover, farther downstream existing structural systems have inlet elevations that are also too high relative to the upstream nodes 1 and node 2 for any connectivity to occur.

CITY OF SAN DIEGO - AIR FIRE RESCUE FACILITY
MONTGOMERY AIRPORT POST-DEVELOPMENT DRAINAGE



DRAINAGE OVERVIEW:

SPECIAL NOTE:
SURFACE ELEVATIONS BETWEEN NODES 1 & 2 COMPARED TO ANY OF THE COLLECTION POINTS IN DMA "A", "B", OR "C", ARE RELATIVELY THE SAME ELEVATION. THEREFORE, BMPs WITH TREATMENT & HYDROMODIFICATION PURPOSES TYPICALLY REQUIRE VERTICAL DEPTHS STARTING AT THE SURFACE ELEVATIONS. CONSEQUENTLY, UTILIZING TRADITIONAL BMPs MAY PROVE INFEASIBLE.

DMA "A"

1. DMA "A" WESTERLY RIDGE IS TAXIWAY CHARLIE.
2. DRAINAGE FLOWS EASTERLY TOWARD AND AROUND EXISTING BUILDING TO NODES 1 & 2. INITIAL FLOWS LIKELY POND IMMEDIATELY DOWNSTREAM AND DO NOT REACH HEADWALL 1,650 FEET AWAY.
3. NODE 1 INLET SURFACE ELEVATION IS ~419.5' WITH A PIPE OUTLET ELEVATION OF ~416.7' (PER CITY OF SAN DIEGO SURVEY). APPROXIMATE 3' ELEVATION DIFFERENCE MAY BE BEST LOCATION FOR TREATMENT BMP. HOWEVER, DOWNSTREAM CONTOUR OF 418' COINCIDES WITH VERNAL POOL AT NODE 1. MOREOVER, A TYPICAL TREATMENT BMP WITH HYDROMODIFICATION REQUIREMENTS WILL LIKELY REQUIRE A VERTICAL CROSS SECTION OF 4, OR MORE, FEET. THEREFORE, THIS OPTION APPEARS INFEASIBLE.
4. VERNAL POOLS EXIST DOWNSTREAM OF NODES 1 & 2.
5. TRAVEL DISTANCE FROM NODE 1 OUTLET TO HEADWALL IS APPROX. 1,650 FEET WITH AN ELEVATION DIFFERENCE OF LESS THAN 2 FEET (i.e., FLAT).
6. 2018 GOOGLE EARTH IMAGE SHOWS PONDING WITHIN THE 418' CONTOUR FOR APPROXIMATELY 800 FEET.
7. EXISTING HEADWALL NEAR RUNWAY 28R THRESHOLD SERVES HIGHER WATER SURFACE ELEVATION FLOWS, BUT PROBABLY HAS MINIMAL SERVICE FOR THE 418' WATER SURFACE ELEVATION FLOWS. PIPE FLOW DRAINS SOUTHERLY AND ULTIMATELY CONNECTS TO STORM DRAIN WITHIN AERO DR.

DMA "B"

1. TWO OUTLET OPTIONS ARE SHOWN WEST OF TAXIWAY CHARLIE - ONE NEAR THE PROPOSED APRON (NODE 4, ~EL.=420') & THE OTHER JUST NORTH OF RUNWAY 28R (NODE 3, ~EL.=420').
2. WITH TRAVELS LENGTHS OF 515 FEET AND 850 FEET, RESPECTIVELY, ALONG WITH CONTOUR ELEVATIONS BEING APPROXIMATELY THE SAME AND WITH A VERTICAL DEPTH REQUIREMENT FOR THE TREATMENT BMP, AS NOTED IN DMA "A" #3 ABOVE, THIS OPTION APPEARS INFEASIBLE.
3. CONNECTING DIRECTLY TO HEADWALL FARTHER DOWNSTREAM REMAINS A CHALLENGE BECAUSE ALTHOUGH LOWER, IT IS FARTHER. THUS, SAME CHALLENGES REMAIN.

DMA "C"

1. SINCE NODE 1 IS FARTHER AND LOWER THAN NODE 2 FOR THIS OPTION, NODE 1 IS CONSIDERED THE CRITICAL PATH.
2. WITH A TRAVEL LENGTH OF 1,250 FEET, ALONG WITH ELEVATIONS BEING APPROXIMATELY THE SAME (NODE 5, ~EL.=420) AND A WITH A VERTICAL DEPTH REQUIREMENT FOR THE TREATMENT BMP, AS NOTED IN DMA "A" #3 ABOVE, THIS OPTION APPEARS INFEASIBLE.
3. CONNECTING DIRECTLY TO HEADWALL FARTHER DOWNSTREAM REMAINS A CHALLENGE BECAUSE ALTHOUGH LOWER, IT IS FARTHER. THUS, THE SAME CHALLENGES REMAIN.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: The project proposes to construct two hangars for helicopters, apron areas for the helicopters, fuel tender areas, and a small maintenance facility structure. The hangars will share walls with the existing FAA facility building. The FAA facility building will be renovated to function along with the proposed improvements.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The project proposes two hangars and paved apron areas
List/describe proposed pervious features of the project (e.g., landscape areas): There are large existing natural and manufactured landscaped areas surrounding the proposed improvement areas.
Does the project include grading and changes to site topography? ☑ Yes ☐ No Description / Additional Information: Although the site is reasonably flat, the project proposes to continue to use relatively flat grade areas for the proposed paved aprons.

Form I-3B Page 5 of 11

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

☑ Yes
☐ No

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

Description / Additional Information:

The project proposes to route all runoff from new impervious areas into a modular wetland for water quality and then into an underground storage system for detention of the 100-year peak volumes. Captured peak runoff volumes from the 6-hr, 100-yr storm event will be pumped and hauled off for discharge into an acceptable MS4 that meets the R9-2013-0001 permit, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266. City of San Diego, the owner of the underground storage system, is in process of determined disposal arrangements.

Project Name: San Diego Fire Rescue Air Facility - Montgomery Airport

Form I-3B Page 6 of 11
Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply): ☑ Onsite storm drain inlets ☐ Interior floor drains and elevator shaft sump pumps ☐ Interior parking garages ☑ Need for future indoor & structural pest control ☑ Landscape/outdoor pesticide use ☐ Pools, spas, ponds, decorative fountains, and other water features ☐ Food service ☐ Refuse areas ☐ Industrial processes ☐ Outdoor storage of equipment or materials ☑ Vehicle and equipment cleaning ☑ Vehicle/equipment repair and maintenance ☑ Fuel dispensing areas ☐ Loading docks ☐ Fire sprinkler test water ☐ Miscellaneous drain or wash water ☑ Plazas, sidewalks, and parking lots Description/Additional Information: On-site wash racks will be required for the maintenance of the helicopters. Wash water will be properly disposed of by city personnel or their assignees.

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) Runoff from improved ares will be collected by a proposed trench drain that will then convey flows to a water quality treatment facility for treatment of the first flush, higher flows and treated flows will be conveyed into a proposed underground tank for full detention of the 6-hr, 100-yr peak flows. The runoff volume will then be will discharged into existing storm water facilities. On-site streams and culverts convey flows off-site to the south into a public underground system within Aero Drive. The public storm drain and natural canyons convey runoff from the area 2.5 miles south to discharge into the San Diego River, then flows 7.5 miles west to the Pacific Ocean.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations MUN, AGR, IND, PROC, REC1, REC2, WARM, COLD, WILD
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations None
Provide distance from project outfall location to impaired or sensitive receiving waters Vernal Pools exist approximately 100 feet away from the proposed ground disturbance areas but will not be impacted by the associated construction work.
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands A modular wetlands system will capture and treat the overland flow from the proposed improvements. Moreover, a storage tank adjacent to the modular wetlands system will capture 100% of the 6-hr 100-year storm from the proposed flows and unimproved tributary flows . Therefore, post developments improvement flows will not discharge onto the vernal pool areas.

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body (Refer to Appendix K)	Pollutant(s)/Stressor(s) (Refer to Appendix K)	TMDLs/WQIP Highest Priority Pollutant (Refer to Table 1-4 in Chapter 1)
San Diego River	Enterococcus, Coliform, Low Dissolved Oxygen	Indicator Bacteria
	Manganese, Nitrogen,	
	Phosphorous, TDS, Toxicity	

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see Appendix B.6):			
Pollutant	**Not Applicable to the Project Site**	**Anticipated from the Project Site**	**Also a Receiving Water Pollutant of Concern**
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐
Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Form I-3B Page 9 of 11
Hydromodification Management Requirements
Do hydromodification management requirements apply (see Section 1.6)? ☑ Yes, hydromodification management flow control structural BMPs required. ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides. Description / Additional Information (to be provided if a 'No' answer has been selected above): The project flow will be captured by a trench drain and routed to a proposed modular wetland for water quality purposes. Subsequent 0.1Q2 to Q10 flows, along with the 6-hr, 100-yr peak flows will be routed to the underground storage tank with capacity to retain all flows in order to prevent discharging onto the vernal pools located down stream. All capture runoff volumes will be pumped and hauled offsite by city-assigned personnel for discharge into an acceptable MS4 that meets the requirements of R9-2013-0001, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266. Note: If "No" answer has been selected the SWQMP must include an exhibit that shows the storm water conveyance system from the project site to an exempt water body. The exhibit should include details about the conveyance system and the outfall to the exempt water body.
Critical Coarse Sediment Yield Areas* ***This Section only required if hydromodification management requirements apply**
Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint? ☐ Yes ☑ No Discussion / Additional Information:

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* ***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. Not applicable, due to all flows being captured in an underground storage tank.
Has a geomorphic assessment been performed for the receiving channel(s)? ☑No, the low flow threshold is $0.1Q_2$ (default low flow threshold) ☐Yes, the result is the low flow threshold is $0.1Q_2$ ☐Yes, the result is the low flow threshold is $0.3Q_2$ ☐Yes, the result is the low flow threshold is $0.5Q_2$ If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional) Not applicable, due to all flows being captured in an underground storage tank.

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Source Control BMP Checklist for PDPs	Form I-4B		
Source Control BMPs			
All development projects must implement source control BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Form I-4B Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☑ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	☑ N/A
Interior parking garages	☐ Yes	☐ No	☑ N/A
Need for future indoor & structural pest control	☑ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☐ Yes	☐ No	☑ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☑ N/A
Food service	☐ Yes	☐ No	☑ N/A
Refuse areas	☑ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☑ N/A
Outdoor storage of equipment or materials	☑ Yes	☐ No	☐ N/A
Vehicle/Equipment Repair and Maintenance	☑ Yes	☐ No	☐ N/A
Fuel Dispensing Areas	☑ Yes	☐ No	☐ N/A
Loading Docks	☐ Yes	☐ No	☑ N/A
Fire Sprinkler Test Water	☐ Yes	☐ No	☑ N/A
Miscellaneous Drain or Wash Water	☐ Yes	☐ No	☑ N/A
Plazas, sidewalks, and parking lots	☑ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☑ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☑ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☑ N/A
SC-6D: Automotive Facilities	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Site Design BMP Checklist for PDPs	Form I-5B		
Site Design BMPs			
All development projects must implement site design BMPs where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following. • "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided. A site map with implemented site design BMPs must be included at the end of this checklist.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.1 not implemented: Maintain existing on-site vernal pools.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☑ Yes	☐ No	☐ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☑ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☑ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A
4.3.2 Have natural areas, soils and vegetation been conserved?	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.2 not implemented: Large natural areas around the project site have been conserved.			

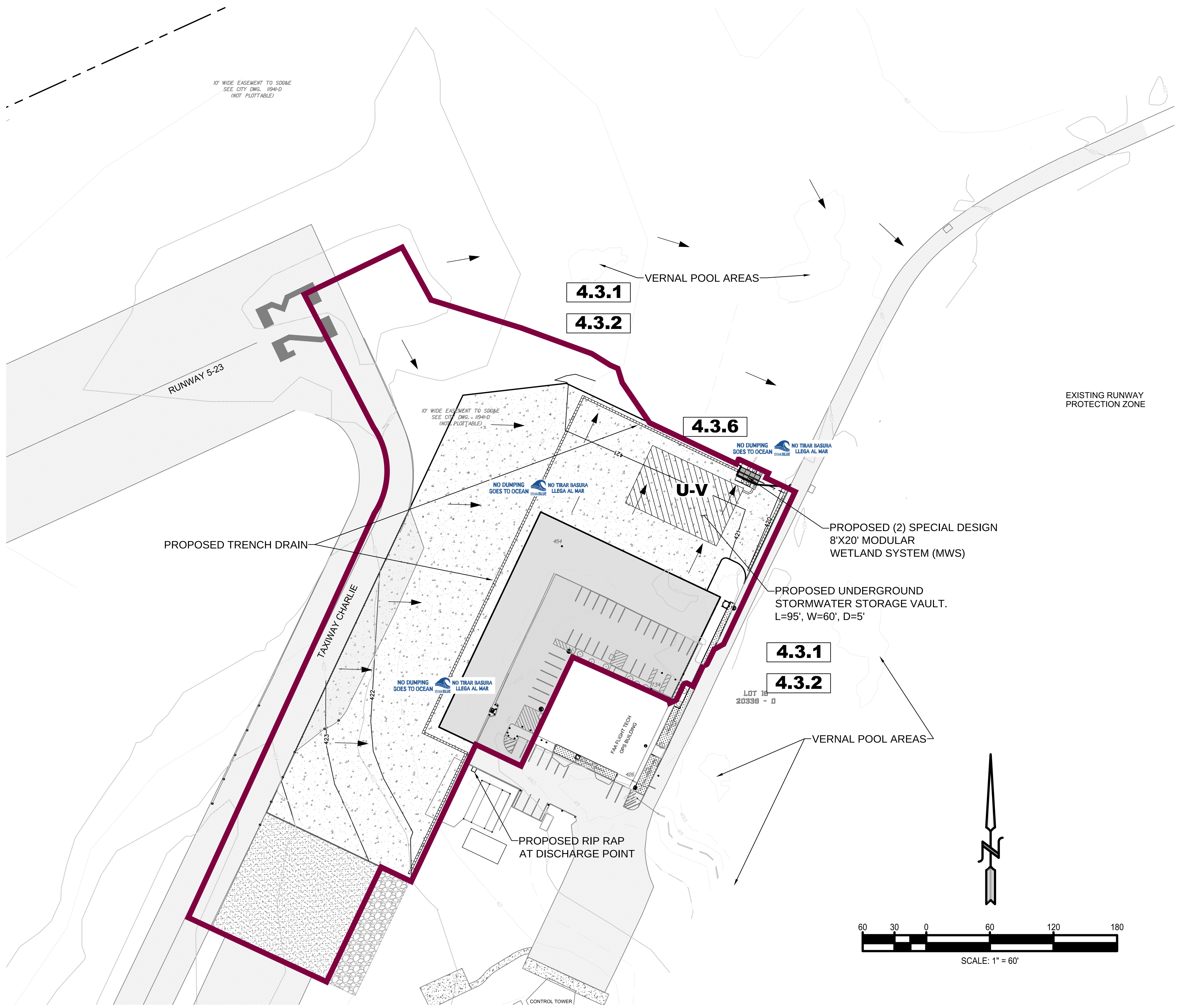
Project Name: San Diego Fire Rescue Air Facility - Montgomery Airport

Form I-5B Page 2 of 4			
Site Design Requirement	**Applied?**		
4.3.3 Minimize Impervious Area	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☐ Yes	☐ No	☑ N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.5 not implemented: There are no pervious areas down stream, within the proposed improvements. All flows within proposed improvements sheet flow to a trench drain which conveys flows to the proposed modular wetland for water quality purposes.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☑ No	☐ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☑ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☑ N/A

Form I-5B Page 3 of 4			
Site Design Requirement	**Applied?**		
4.3.6 Runoff Collection	☑ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.6 not implemented: Due to FAA minimum design requirements for proper, and safe, movement and placement of helicopters, the impervious surfaces footprint cannot be made any smaller. And the following "No" responses is in response to the requirements for this design to meet FAA guidelines.			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	☐ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☑ No	☐ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	☐ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☑ No	☐ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.7 not implemented: There is no new landscaping proposed.			
4.3.8 Harvest and Use Precipitation	☐ Yes	☑ No	☐ N/A
Discussion / justification if 4.3.8 not implemented:			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☑ No	☐ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☑ No	☐ N/A

Form I-5B Page 4 of 4
Insert Site Map with all site design BMPs identified:

AIR FIRE RESCUE FACILITY
SITE / BMP MAP



ENGINEERING PERMIT NO: ______________
DISCRETIONARY PERMIT NO: ______________
PRIVATE CONTRACT

SITE / BMP MAP

AIR FIRE RESCUE FACILITY

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 1 OF 1 SHEETS

PROJECT NO. ______

FOR CITY ENGINEER ______ DATE ______

V.T.M. ______

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XXX			
AS-BUILTS				

XXXX-XXXX
NAD83 COORDINATES

XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

The City of SAN DIEGO

PUBLIC WORKS DEPARTMENT

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Summary of PDP Structural BMPs	Form I-6
PDP Structural BMPs	
All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s). PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual). Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).	
Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. Existing flows are from northwest to southeast. Southeast of the proposed BMP exists vernal pools. Due to proposed improvements, discharge will no longer be allowed to flow onto the vernal pools. Moreover, due to the treatment BMP requirement of being at or below grade of the upstream flows, the proposed modular wetlands system cannot connect to any existing MS4. The nearest MS4 is on Ponderosa Ave, over 1,200 feet away with a depth of only approximately 4 feet. As a result, the project proposes to drain all runoff from new impervious areas into a modular wetlands system for water quality for treatment of the Design Capture Volume. The additional flows will then flow into an underground storage system for detention of the 100-year peak volumes. 100% of the captured runoff volumes will then be pumped and hauled offsite by city-assigned personnel for discharge into an acceptable MS4 that meets the requirements of R9-2013-0001, as amended by R9-2015-0001 and R9-2015-0100, NPDES CAS0109266. (Continue on page 2 as necessary.)	

Form I-6 Page 2 of 2
(Continued from page 1)

Form I-6 Page 1 of 2 (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No. BMP-1	
Construction Plan Sheet No. Current entitlement review C-1	
Type of Structural BMP: ☐ Retention by harvest and use (e.g. HU-1, cistern) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☑ Other (describe in discussion section below)	
Purpose: ☑ Pollutant control only ☐ Hydromodification control only ☐ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Kenneth Gethers C&S Companies
Who will be the final owner of this BMP?	City of San Diego
Who will maintain this BMP into perpetuity?	City of San Diego
What is the funding mechanism for maintenance?	City of San Diego

Form I-6 Page 2 of 2 (Copy as many as needed)
Structural BMP ID No. BMP-1
Construction Plan Sheet No. Current entitlement review C-1
Discussion (as needed; must include worksheets showing BMP sizing calculations in the SWQMPs): The project proposes to use a modular wetland for pollutant control only.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 1
Backup For PDP Pollutant Control BMPs

This is the cover sheet for Attachment 1.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Indicate which Items are Included:

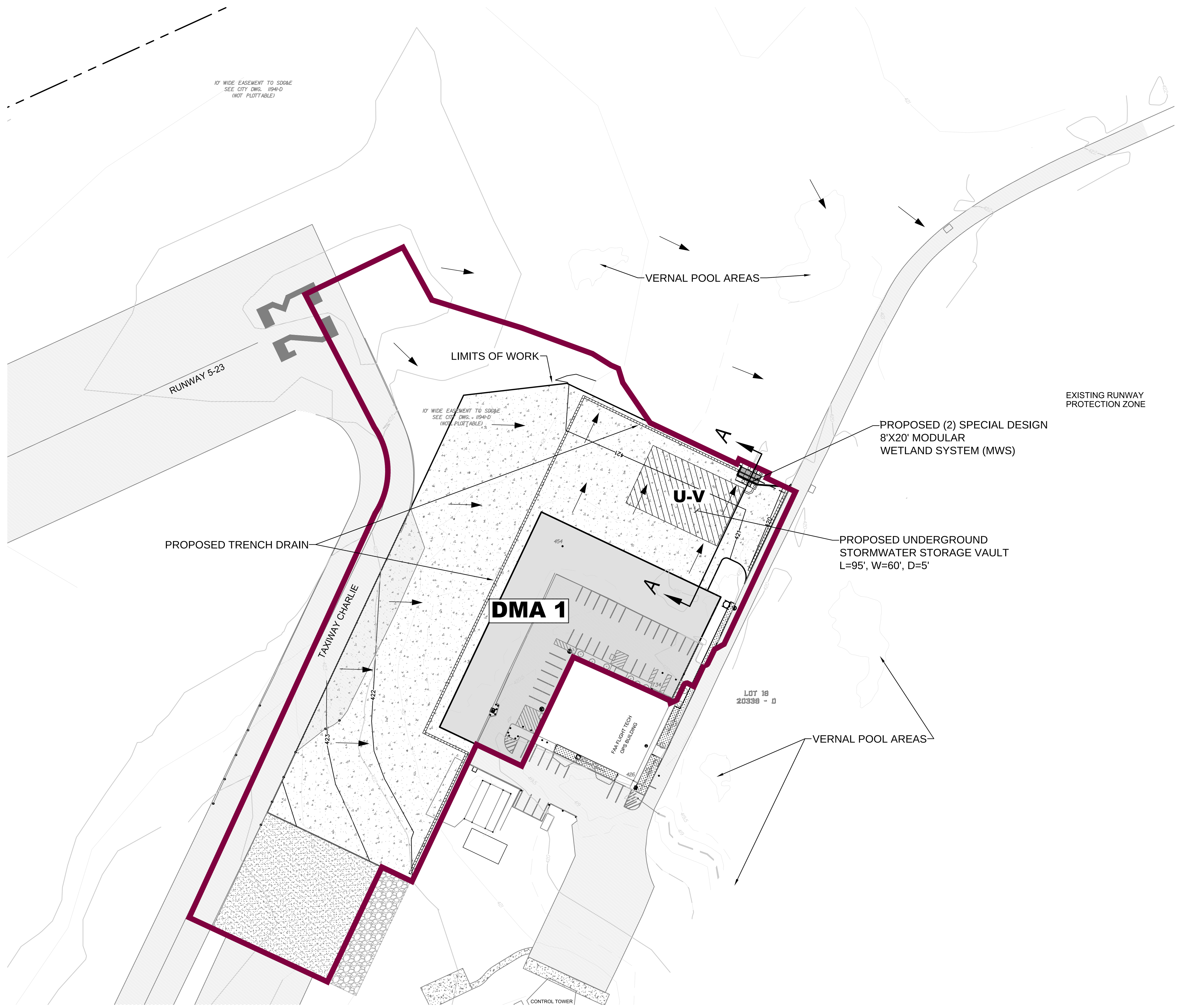
Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☑ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☑ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☑ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Infiltration Feasibility Information. Contents of Attachment 1d depend on the infiltration condition: • No Infiltration Condition: o Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) o Form I-8A (optional) o Form I-8B (optional) • Partial Infiltration Condition: o Infiltration Feasibility Condition Letter (*Note: must be stamped and signed by licensed geotechnical engineer*) o Form I-8A o Form I-8B • Full Infiltration Condition: o Form I-8A o Form I-8B o Worksheet C.4-3 o Form I-9 Refer to Appendices C and D of the BMP Design Manual for guidance.	No infiltration due to geological instability, See geotechnical report for feasibility letter ☑ Included ☑ Not included because infiltration not allowed due to geological instability
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☑ Included

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

The DMA Exhibit must identify:

- [x] Underlying hydrologic soil group
- [x] Approximate depth to groundwater
- [x] Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- [ ] Critical coarse sediment yield areas to be protected
- [x] Existing topography and impervious areas
- [x] Existing and proposed site drainage network and connections to drainage offsite
- [x] Proposed grading
- [x] Proposed impervious features
- [x] Proposed design features and surface treatments used to minimize imperviousness
- [x] Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- [x] Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- [x] Structural BMPs (identify location, type of BMP, size/detail, and include cross-section)

AIR FIRE RESCUE FACILITY
DMA MAP



LEGEND

DRAINAGE MANAGEMENT AREA (DMA)

FLOW DIRECTION

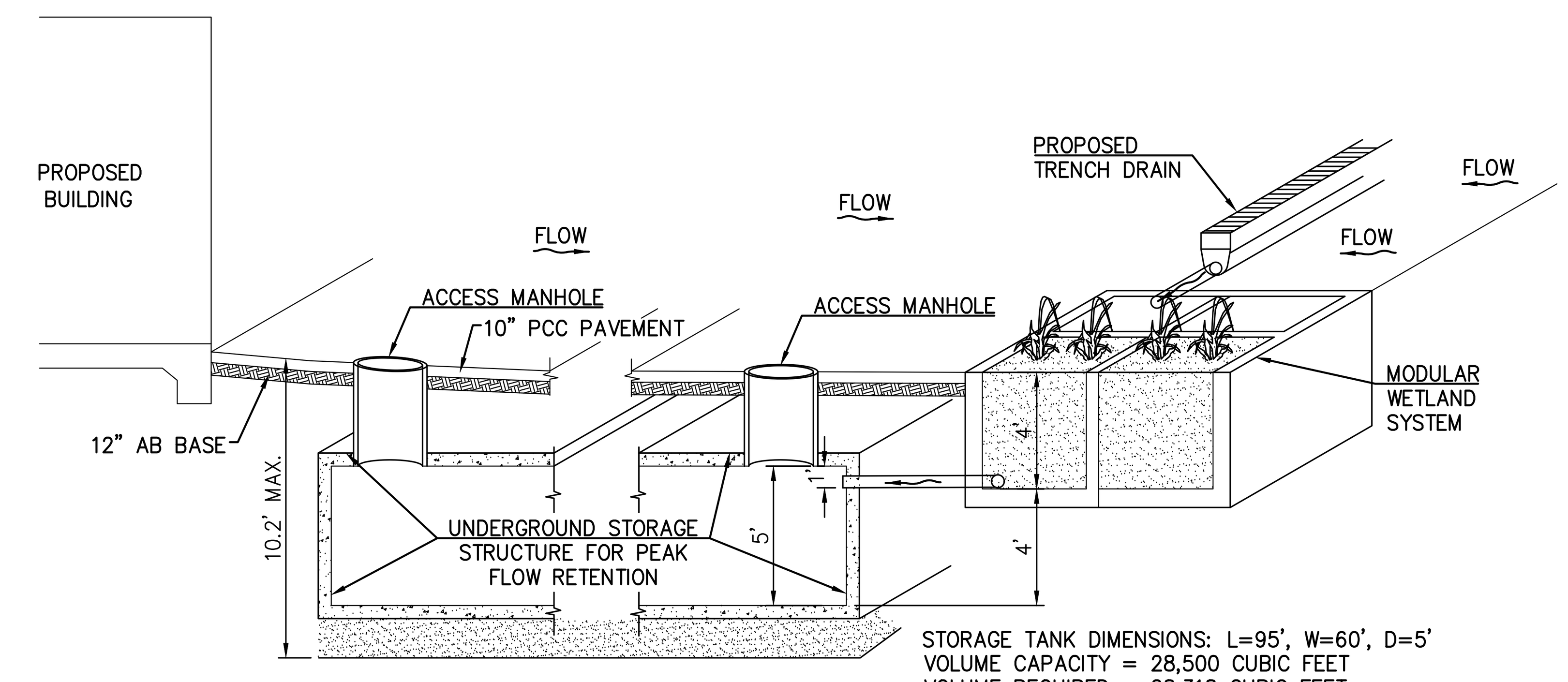
DMA 1 — DMA ID NUMBER

MODULAR WETLAND SYSTEM

U-V — STORMWATER STORAGE TANK

NOTES:

1. THE UNDERLYING SOIL TYPE GROUP IS "D" FOR THE ENTIRE PROPERTY AND SURROUNDING PARCELS
2. THE APPROXIMATE DEPTH TO GROUND WATER IS EXPECTED TO BE MORE THAN 10 FEET
3. NO CRITICAL COARSE SEDIMENT YIELD AREAS EXIST ON SITE
4. THE SITE CONTAINS VERNAL POOLS BUT NONE WILL BE IMPACTED.



STORAGE TANK DIMENSIONS: L=95', W=60', D=5'
VOLUME CAPACITY = 28,500 CUBIC FEET
VOLUME REQUIRED = 28,318 CUBIC FEET

TYPICAL SECTION A-A

NO SCALE

1	DVC	DVC	7,754	cubic–feet
2	DVC RETAINED	DVC RETAINED	0	cubic–feet
3	DVC BIOFILTERED	DVC BIOFILTERED	0	cubic–feet
4	DVC REQUIRED FLOW–TRU (LINE 1 – LINE 2 – 0.67 X LINE 3	DVC FLOW–THRU	7,754	cubic–feet
5	ADJUSTED FACTOR (LINE 4/ LINE 1)	AF=	1	unitless
6	DESIGN RAINFALL INTENSITY	i=	0.2	in/hr
7	AREA TRIBUTARY TO BMP	A=	4.0	acres
8	RUNOFF FACTOR	C=	0.89	unitless
9	CALCULATE FLOW RATE = AF x (C x i x A)	Q=	0.712	cfs

DESIGN FLOW RATE = 0.712 X 1.5 = 1.07 CFS

(2) special design Modular Wetlands System 8' X 20' with a combined flow treatment rate of 1.154 cfs which exceeds the treatment flow rate calculated above is being proposed

60 30 0 60 120 180

SCALE: 1" = 60'

ENGINEERING PERMIT NO:________________

DISCRETIONARY PERMIT NO:________________

PRIVATE CONTRACT

DMA MAP

AIR FIRE RESCUE FACILITY

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 1 OF 1 SHEETS

PROJECT NO.__________

FOR CITY ENGINEER — DATE

V.T.M.__________

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XXX			
AS–BUILTS				

XXXX–XXXX
NAD83 COORDINATES

XXX–XXXX
LAMBERT COORDINATES

CONTRACTOR________ DATE STARTED________

INSPECTOR________ DATE COMPLETED________

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

The City of SAN DIEGO

DEVELOPMENT SERVICES DEPARTMENT

SAVE DATE: 11/4/2019 ~ PLOT DATE: 11/4/2019 ~ FILE NAME: F:\Project\274 - City of San Diego\274001002- Air Fire Rescue Facility\Planning-Study\Provided by Others\from HWL\Phase 2 (6-20-2019)\20190820_Phase 2\18301 PGP Phase 2 - Standard\SWQMP\Mont_DMA MAP_Phase 2-updated.dwg

Harvest and Use Feasibility Checklist	Worksheet B.3-1 : Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

☐ Toilet and urinal flushing
☐ Landscape irrigation
☐ Other:___________

No demand for harvest water. No landscaping proposed

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.
[Provide a summary of calculations here]

N.A.

3. Calculate the DCV using worksheet B-2.1.
DCV = ______________ (cubic feet)
[Provide a summary of calculations here]

N.A.

3a. Is the 36-hour demand greater than or equal to the DCV? ☐ Yes / ☐ No ⇨ ⇩ No Demand	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV? ☐ Yes / ☐ No ⇨ ⇩ No Demand	3c. Is the 36-hour demand less than 0.25DCV? ☐ Yes ⇩ No Demand
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?
☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☑ No, select alternate BMPs.

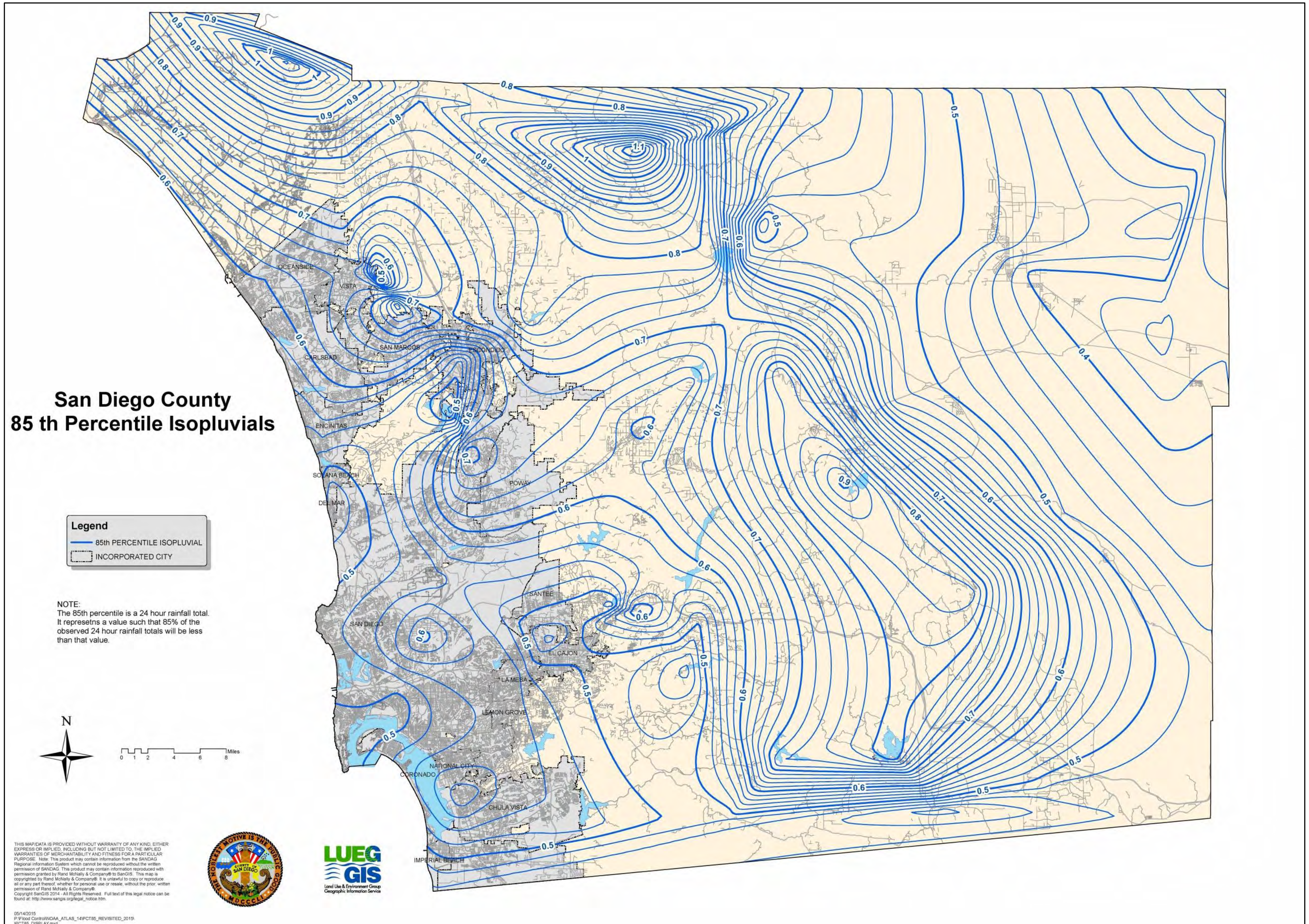


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA **and** the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

<table>
<tr><th>Criteria</th><th>Answer</th><th>Progression</th></tr>
<tr><td rowspan="3"><u>Criteria 1 and 3</u>:

What is the infiltration condition of the DMA?

Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.

Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination:
Infiltration Feasibility Condition Letter; or
Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B.
Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal</td><td>○ Full Infiltration Condition</td><td>Stop. Compact biofiltration BMP is not allowed.</td></tr>
<tr><td>○ Partial Infiltration Condition</td><td>Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5-2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction).

If the required volume reduction is achieved proceed to Criteria 2.

If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. Stop.</td></tr>
<tr><td>○ No Infiltration Condition</td><td>Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP.

If the criteria in Table B.5-1 is met proceed to Criteria 2.

If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. Stop.</td></tr>
</table>

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Volume retention/reduction is not applicable, since 100% of runoff from new impervious surfaces will be detain and hauled-off to an assigned discharge location

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	○ Meets Flow based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.) **Proceed to Criteria 4.**
	○ Meets Volume based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	○ Does not Meet either criteria	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Criteria	Answer	Progression
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	◉ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	○ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

See attached documentation

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
<u>Criteria 5</u>: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	○ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

See attached documentation

Criteria	Answer	Progression
<u>Criteria 6</u>: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	○ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 6:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).

See attached documentation

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	○ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	○ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	○ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

See attached documentation

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Section 2: Verification (For City Use Only)		
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	○ Yes ○ No, See explanation below	
Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:		

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	7,754	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow-thru}$	7,754	cubic-feet
5	Adjustment factor (Line 4 / Line 1)	AF=	1.0	unitless
6	Design rainfall intensity	i=	0.20	in/hr.
7	Area tributary to BMP (s)	A=	4.0	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.89	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.712	cfs

1. Adjustment factor shall be estimated considering only retention and biofiltration BMPs located upstream of flow-thru BMPs. That is, if the flow-thru BMP is upstream of the project's retention and biofiltration BMPs then the flow-thru BMP shall be sized using an adjustment factor of 1.
2. Volume based (e.g., dry extended detention basin) flow-thru treatment control BMPs shall be sized to the volume in Line 4 and flow based (e.g., vegetated swales) shall be sized to flow rate in Line 9. Sand filter and media filter can be designed either by volume in Line 4 or flow rate in Line 9.
3. Proprietary BMPs, if used, shall provide certified treatment capacity equal to or greater than the calculated flow rate in Line 9; certified treatment capacity per unit shall be consistent with third party certifications.

Design flow rate = 0.712 * 1.5 = **1.07 cfs**

(2) special design Modular Wetlands System 8' X 20' with a combined flow treatment rate of 1.154 cfs which exceeds the treatment flow rate calculated above is being proposed

April 20th, 2016

Project: All Related

Subject: MWS Linear BMP Classification Per San Diego Manual

To Whom It May Concern:

It is the intention of this document to use the MWS Linear as a biofiltration BMP. Based upon definitions of Biofiltration as found in Section 2.2.1 and Appendix F of the manual the MWS Linear meets the criteria to be classified as biofiltration and therefore is not flow through treatment and thus does not trigger the need for alternative compliance. The MWS Linear has GULD approval for basic, phosphorus and enhanced treatment under the TAPE approval. The system is certified under the TAPE approval at a loading rate of 1 gpm/sq ft for all three pollutant categories. This is consistent with the performance criteria related to the performance of Appendix F.

Let us first address the comment regarding the MWS (referring to the Modular Wetland System Linear) being flow through treatment. To do so let us look at the definition of biofiltration as provided by the Design Manual which states:

> *"For situations where onsite retention of the 85th percentile storm volume is not feasible, biofiltration must be provided to satisfy specific "biofiltration standards" i.e. a set of selection, sizing, design and operation and maintenance (O&M) criteria that must be met for a BMP to be considered a "biofiltration BMP" – see Section 2.2.1 and Appendix F."*

If we look at section 2.2.2 Storm Water Pollutant Control Performance Standard it states:

> *"(i) If it is not technically feasible to implement retention BMPs for the full DCV onsite for a PDP, then the PDP shall utilize biofiltration BMPs for the remaining volume not reliably retained. Biofiltration BMPs must be designed as described in Appendix F to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP, and must be sized to:*
>
> > *[a]. Treat 1.5 times the DCV not reliably retained onsite, OR*
> >
> > *[b]. Treat the DCV not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the DCV not reliably retained onsite."*

P O Box 869 Oceanside CA 92049
(760) 433-7640 • Fax (760) 433-3176
www.BioCleanEnvironmental.net

As the manual states Biofiltration BMPs must be designed as described in Appendix F which states:

> *"A project applicant must be able to affirmatively demonstrate that a given BMP is designed and sized in a manner consistent with this definition to be considered as a "biofiltration BMP" as part of a compliant storm water management plan."*
>
> *"This appendix contains a checklist of the key underlying criteria that must be met for a BMP to be considered a biofiltration BMP. The purpose of this checklist is to facilitate consistent review and approval of biofiltration BMPs that meet the "biofiltration standard" defined by the MS4 Permit."*
>
> *"This checklist includes specific design criteria that are essential to defining a system as a biofiltration BMP; however it does not present a complete design basis. This checklist was used to develop BMP Fact Sheets for PR-1 biofiltration with partial retention and BF-1 biofiltration, which do present a complete design basis. Therefore, biofiltration BMPs that substantially meet all aspects of the Fact sheets PR-1 or BF-1 should be able to complete this checklist without additional documentation beyond what would already be required for a project submittal."*
>
> *"Other biofiltration BMP designs (including both non-proprietary and proprietary designs) may also meet the underlying MS4 Permit requirements to be considered biofiltration BMPs. These BMPs may be classified as biofiltration BMPs if they (1) meet the minimum design criteria listed in this appendix, including the pollutant treatment performance standard in Appendix F.1, (2) are designed and maintained in a manner consistent with their performance certifications (See explanation in Appendix F.2), if applicable, and (3) are acceptable at the discretion of the [City Engineer]. The applicant may be required to provide additional studies and/or required to meet additional design criteria beyond the scope of this document in order to demonstrate that these criteria are met."*

As stated the Biofiltration BMP must meet three objectives. The following outlines how the Modular Wetland System Linear meets these criteria.

Minimum Design Criteria

1. Biofiltration BMPs shall be allowed only as described in the BMP selection process in this manual (i.e., retention feasibility hierarchy).

    a. The Modular Wetland System Linear (MWS Linear) is only being proposed on plans when retention via infiltration or reuse is proven infeasible. Conditions such as soils with little to no infiltration rate or sites in which insufficient landscaping warrant to successful implementation of reuse systems.

2. Biofiltration BMPs must be sized using acceptable sizing methods described in this manual.

    a. Section B.5.2 Basis for Minimum Sizing Factor for Biofiltration BMPs states:

    "The MS4 Permit describes conceptual performance goals for biofiltration BMPs and specifies numeric criteria for sizing biofiltration BMPs (See Section 2.2.1 of this Manual). However, the MS4 Permit does not define a specific footprint sizing factor or design profile that must be provided for the BMP to be considered "biofiltration."

    "Additionally, it does not apply to alternative biofiltration designs that utilize the checklist in Appendix F (Biofiltration Standard and Checklist). Acceptable alternative designs (such as proprietary systems meeting Appendix F criteria) typically include design features intended to allow acceptable performance with a smaller footprint and have undergone field scale testing to evaluate performance and required O&M frequency."

    As stated in the Manual alternative biofiltration designs are allowed. The MWS Linear therefore qualifies as a biofiltration BMP under this definition as it has both undergone field scale testing (TAPE tested and approved with a GULD) and provides requirements on O&M frequency. In addition, the MWS Linear can be sized to treat either 1.5 times the DCV not reliably retained onsite OR 1.0 times the portion of the DCV not reliably retained onsite; and additionally check that the system has a total static (i.e. non-routed) storage volume, including pore spaces and pre-filter detention volume to at least 0.75 times the portion of the DCV not reliably retained onsite.

3. Biofiltration BMPs must be sited and designed to achieve maximum feasible infiltration and evapotranspiration.

    a. The MWS Linear is utilized and placed in the same manner as other types of biofiltration systems. As with other biofiltration systems the MWS Linear includes and underdrain for the remaining portion of the DCV that is not retained via incidental infiltration (as biofiltration if infiltration is not feasible due to poor soils) and evapotranspiration. The MWS Linear can be designed with an open bottom to maximize this incidental infiltration. The only exception to this, as with other biofiltration BMPs, is when the geotechnical consultant recommends an impervious liner be used due to specific soil conditions such as expansive clays. Additionally, the MWS Linear utilizes an amended media that is much more porous than the standard prescribed biofiltration media which is a mix of sand and compost. 100% of the media used in the MWS Linear has interparticle voids of 48% plus and 24% internal void space for each media particle. This is much greater than the sand which has interparticle voids of 35% and internal voids of 0%. As such, the MWS Linear retains greater moisture which allows for greater volume retention and ultimately evapotranspiration via respiration of the contained vegetation.

P O Box 869 Oceanside CA 92049
(760) 433-7640 • Fax (760) 433-3176
www.BioCleanEnvironmental.net

4. Biofiltration BMPs must be designed with a hydraulic loading rate to maximize pollutant retention, preserve pollutant control/sequestration processes, and minimize potential for pollutant washout.

    a. The manual states:

    "Alternatively, for proprietary designs and custom media mixes not meeting the media specifications contained in the City or County LID Manual, field scale testing data are provided to demonstrate that proposed media meets the pollutant treatment performance criteria in Section F.1 below."

    The MWS Linear has been tested under the Washington State TAPE protocol which is full scale field testing and has received General Use Level Designation under that protocol. Table F.1-1, as shown below, requires a biofiltration BMP to have Basic Treatment, Phosphorus Treatment, and Enhanced Treatment under this protocol. The MWS Linear has GULD approval for all three and therefore meets this minimum requirement 4. A copy of the TAPE approval has been attached to this document.

Table F.1-1: Required Technology Acceptance Protocol-Ecology Certifications for Polltuants of Concern for Biofiltration Performance Standard

Project Pollutant of Concern	Required Technology Acceptance Protocol-Ecology Certification for Biofiltration Performance Standard
Trash	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Sediments	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Oil and Grease	Basic Treatment, Phosphorus Treatment, Enhanced Treatment
Nutrients	Phosphorus Treatment[1]
Metals	Enhanced Treatment
Pesticides	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Organics	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment
Bacteria and Viruses	Basic Treatment (including bacteria removal processes)[3] , Phosphorus Treatment, Enhanced Treatment
Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment	Basic Treatment (including filtration)[2] Phosphorus Treatment, Enhanced Treatment

P O Box 869 Oceanside CA 92049
(760) 433-7640 • Fax (760) 433-3176
www.BioCleanEnvironmental.net

5. Biofiltration BMPs must be designed to promote appropriate biological activity to support and maintain treatment processes.

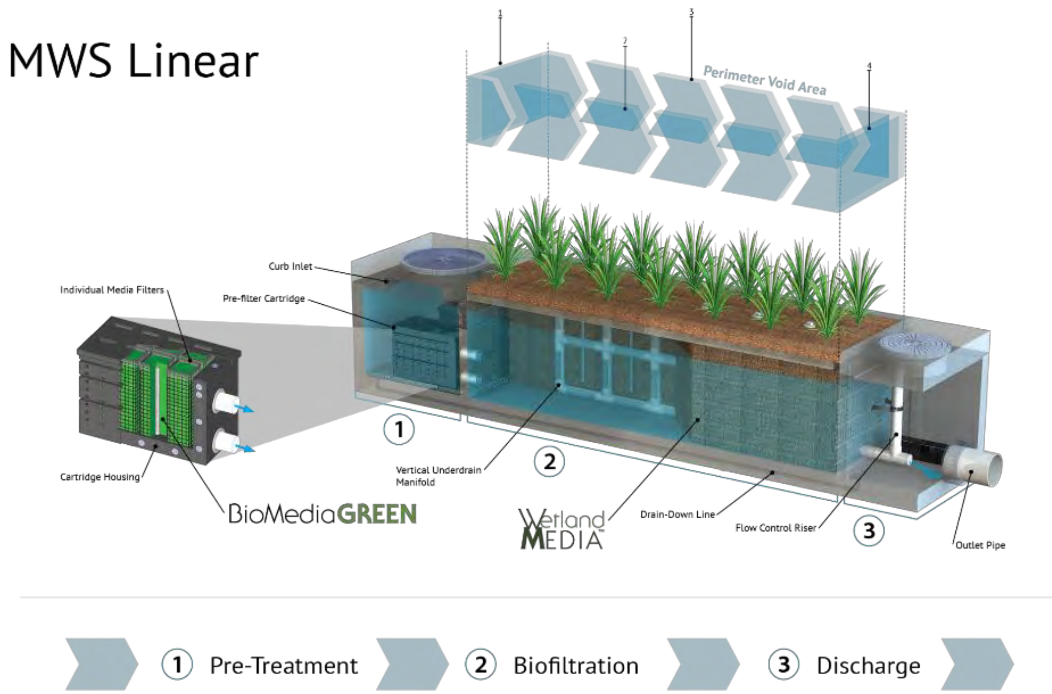
    a. The MWS Linear an advanced vegetated biofiltration promotes biological processes found in both upland bioretention systems and wetlands. The system utilizes an advanced horizontal flow design to ensure maximum contact with the vegetation root mass. Bacterial growth, supported by the root system in the wetland chamber, performs a number of treatment processes. These vary as a function of moisture, temperature, pH, salinity, and pollutant concentrations. Biologically available forms of nitrogen, phosphorus, and carbon are actively taken into the cells of vegetation and bacteria, and used for metabolic processes (i.e., energy production and growth). Nitrogen and phosphorus are actively taken up as nutrients that are vital for a number of cell functions, growth, and energy production. These processes remove metabolites from the media during and between storm events, making the media available to capture more nutrients from subsequent storms.

    b. Soil organisms in the wetland chamber can break down a wide array of organic compounds into less toxic forms or completely break them down into carbon dioxide and water (Means and Hinchee 1994). Bacteria can also cause metals to precipitate out as salts, bind them within organic material, and accumulate metals in nodules within the cells. Finally, plant growth may metabolize many pollutants, sequester them or rendering them less toxic (Reeves and Baker 2000).

    c. Following are pictures from the plants pulled from a MWS Linear after only 14 months of growth. The media used in the system is designed to maximize biological activity:

6. Biofiltration BMPs must be designed to prevent erosion, scour, and channeling within the BMP.

    a. The MWS Linear is a self-contained system with a pre-treatment chamber. Unlike other biofiltration BMPs erosion, scour, and channeling with in the BMP is not an issue. Following is a diagram of the BMP. The system pre-treatment chamber prevent any erosion or scour. The system downstream orifice control prevents channeling of the media:



7. Biofiltration BMP must include operations and maintenance design features and planning considerations to provide for continued effectiveness of pollutant and flow control functions.

    a. The MWS Linear provides activation along with the first year of maintenance and inspection free on all installation in the county of San Diego. Unlike other biofiltration BMPs the City and Co-permitees can be assured the system is being properly installed and maintained. The first year of inspections is used to gauge the amount of loading in the system and this information is used to set appropriate maintenance interval for subsequent years. Attached is a copy of the maintenance manual for the MWS Linear.

Designed & Maintained Consistent with their Performance Certifications

We are in agreement that all BMPs should be designed in a manner consistent with the TAPE certification. The MWS Linear is sized in accordance with the TAPE GULD approval which provides certification at a loading rate of 1 gpm/sq ft (100 in/hr) for Basic, Phosphorus and Enhanced treatment. In addition, as stated previously, Modular Wetland System, Inc. provide activation of all system installed in San Diego County along with the first year of inspections and maintenance to ensure appropriate function. As previously stated, a copy of the TAPE GULD approval is attached to support this claim.

Additionally, it should be noted that the manual allows for biofiltration BMPs to be sized in either volume based (DCV) or flow based design. The manual states in section F.2.2 Sizing of Flow-Based Biofiltration *BMPs:*

> *"This sizing method is only available when the BMP meets the pollutant treatment performance standard in Appendix F.1."*
>
> *"Proprietary biofiltration BMPs are typically designed as a flow-based BMPs (i.e., a constant treatment capacity with negligible storage volume). Additionally, proprietary biofiltration is only acceptable if no infiltration is feasible and where site-specific documentation demonstrates that the use of larger footprint biofiltration BMPs would be infeasible. The applicable sizing method for biofiltration is therefore reduced to: Treat 1.5 times the DCV."*
>
> *"The following steps should be followed to demonstrate that the system is sized to treat 1.5 times the DCV."*
>
> *1. Calculate the flow rate required to meet the pollutant treatment performance standard without scaling for the 1.5 factor. Options include either:*
>
> - *Calculate the runoff flow rate from a 0.2 inch per hour uniform intensity precipitation event (See methodology Appendix B.6.3), or*
>
> - *Conduct a continuous simulation analysis to compute the size required to capture and treat 80 percent of average annual runoff; for small catchments, 5-minute precipitation data should be used to account for short time of concentration. Nearest rain gage with 5-minute precipitation data is allowed for this analysis.*

P O Box 869 Oceanside CA 92049
(760) 433-7640 • Fax (760) 433-3176
www.BioCleanEnvironmental.net

2. Multiply the flow rate from Step 1 by 1.5 to compute the design flow rate for the biofiltration system.

3. Based on the conditions of certification/verification (discussed above), establish the design capacity, as a flow rate, of a given sized unit.

4. Demonstrates that an appropriate unit size and number of units is provided to provide a flow rate that meets the required flow rate from Step 2.

In conclusion, we have closely followed the process and protocol for showing the MWS Linear meets all the criteria to be accepted as Biofiltration as found in Appendix F.

If you have any questions please feel free to contact us directly.

Sincerely,

Zachariha J. Kent

Director of Engineering

Bio Clean Environmental Services, Inc.

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

April 2014

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment
    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment
    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment
    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
4. Ecology approves monitoring for the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic

loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:

- Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
- Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
- Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

- Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
- Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
- Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
    - Standing water remains in the vault between rain events, or
    - Bypass occurs during storms smaller than the design storm.
    - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
    - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant: Modular Wetland Systems, Inc.
Applicant's Address: *PO. Box 869*
Oceanside, CA 92054

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan*: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014*
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014.*

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.

- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

<u>Field Testing</u>

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).

- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:

Applicant: Greg Kent
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92054
gkent@biocleanenvironmental.net

Applicant website: http://www.modularwetlands.com/

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	Revision
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment

TAPE PERFORMANCE SUMMARY

MWS-LINEAR 2.0

Application: Stand Alone Stormwater Treatment Best Management Practice
Type of Treatment: High Flow Rate Media Filtration and Biofiltration (dual-stage)

DESCRIPTION

Modular Wetland System Linear 2.0 (MWS-L 2.0) is an advanced dual-stage high flow rate media and biofiltration system for the treatment of urban stormwater runoff. Superior pollutant removal efficiencies are achieved by treating runoff through a pre-treatment chamber containing a screening device for trash and larger debris, a separation chamber for larger TSS and a series of media filter cartridges for removal of fine TSS and other particulate pollutants. Pre-treated runoff is transferred to the biofiltration chamber which contains an engineered ion exchange media designed to support an abundant plant and microbe community that captures, absorbs, transforms and uptakes pollutants through an array of physical, chemical, and biological mechanisms.

MWS-L 2.0 is a self-contained treatment train that is supplied to the job site completely assembled and ready for use. Once installed, stormwater runoff drains directly from impervious surfaces through an built-in curb inlet, drop in, or via pipe from upstream inlets or downspouts. Treated runoff is discharged from the system through an orifice control riser to assure the proper amount of flow is treated. The treated water leaving the system is connected to the storm drain system, infiltration basins, or to be re-used on site for irrigation or other uses.

TAPE PERFORMANCE

Modular Wetland System Linear 2.0 (MWS-L 2.0) completed its TAPE field testing in the spring of 2013. The Washington DOE has approved the system under the TAPE protocol. The MWS-Linear has met the performance benchmarks for the three major pollutant categories as defined by TAPE: Basic Treatment (TSS), Phosphorus and Enhanced (dissolved zinc and copper). It is the first system tested under the protocol to meet the benchmarks for all three categories.

Pollutant	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Total Suspended Solids	75.0	15.7	85%	Summary of all data meeting TAPE parameters pertaining to this pollutant. Mean of 8 microns.
Total Phosphorus	0.227	0.074	64%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Ortho Phosphorus	0.093	0.031	67%	Summary of all data meeting TAPE parameters for total phosphorus.
Nitrogen	1.40	0.77	45%	Utilizing the Kjeldahl method (Total Kjeldahl nitrogen). Summary of all data during testing.
Dissolved Zinc	0.062	0.024	66%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Dissolved Copper	0.0086	0.0059	38%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Total Zinc	0.120	0.038	69%	Summary of all data during testing.
Total Copper	0.017	0.009	50%	Summary of all data during testing.
Motor Oil	24.157	1.133	95%	Summary of all data during testing.

NOTES:
1. The MWS-Linear was proven effective at infiltration rates of up to 121 in/hr.
2. A minimum of 10 aliquots were collected for each event.
3. Sampling was targeted to capture at least 75 percent of the hydrograph.

Modular Wetland System, Inc.
2972 San Luis Rey Rd
Oceanside, CA 92058

MODULAR WETLANDS™
Nature & Technology Working Together In Perfect Harmony™

www.modularwetlands.com
P 760-433-7640
F 760-433-3179

PERFORMANCE SUMMARY

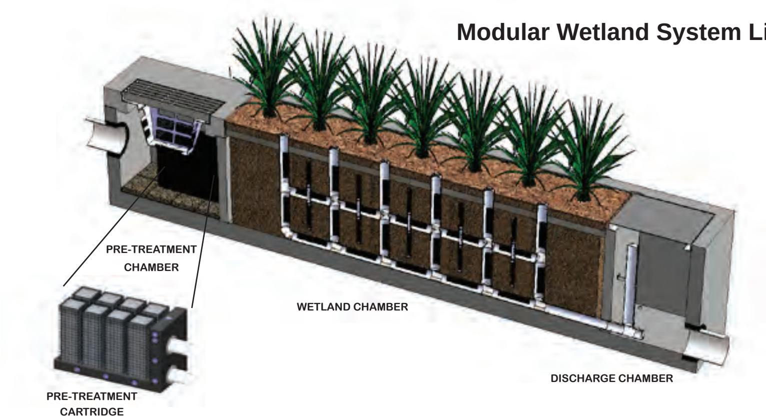
MWS-LINEAR 2.0

Application: Stand Alone Stormwater Treatment Best Management Practice
Type of Treatment: High Flow Rate Media Filtration and Biofiltration (dual-stage)

DESCRIPTION

Modular Wetland System Linear 2.0 (MWS-L 2.0) is an advanced dual-stage high flow rate media and biofiltration system for the treatment of urban stormwater runoff. Superior pollutant removal efficiencies are achieved by treating runoff through a pre-treatment chamber containing a screening device for trash and larger debris, a separation chamber for larger TSS and a series of media filter cartridges for removal of fine TSS and other particulate pollutants. Pre-treated runoff is transferred to the biofiltration chamber which contains an engineered ion exchange media designed to support an abundant plant and microbe community that captures, absorbs, transforms and uptakes pollutants through an array of physical, chemical, and biological mechanisms.

MWS-L 2.0 is a self-contained treatment train that is supplied to the job site completely assembled and ready for use. Once installed, stormwater runoff drains directly from impervious surfaces through an built-in curb inlet, drop in, or via pipe from upstream inlets or downspouts. Treated runoff is discharged from the system through an orifice control riser to assure the proper amount of flow is treated. The treated water leaving the system is connected to the storm drain system, infiltration basins, or to be re-used on site for irrigation or other uses.



Modular Wetland System Linear 2.0 (MWS-L 2.0) has been independently tested in laboratory and field conditions since 2008.

Oceanside Test Site

Portland Test Site

HEAVY METALS: Copper / Zinc

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.76 / .95	.06 / .19	92% / 80%	Majority Dissolved Fraction
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.04 / .24	< .02 / < .05	>50% / >79%	Effluent Concentrations Below Detectable Limits
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.058 / .425	.032 / .061	44% / 86%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	.017/ .120	.009 / .038	50% / 69%	Total Metals

TOTAL SUSPENDED SOLIDS:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	270	3	99%	Sil-co-sil 106 - 20 micron mean particle size
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	45.67	8.24	82%	Mean Particle Size by Count < 8 Microns
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	676	39	94%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	75.0	15.7	85%	Means particle size of 8 microns

Modular Wetland System, Inc.
2972 San Luis Rey Rd
Oceanside, CA 92058

MODULAR WETLANDS™
Nature & Technology Working Together In Perfect Harmony™

www.modularwetlands.com
P 760-433-7640
F 760-433-3179

PERFORMANCE SUMMARY

MWS-LINEAR 2.0

PHOSPHORUS:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
TAPE Field Testing / Portland, OR 2011/2012	Field	.227	.074	64%	TOTAL P
TAPE Field Testing / Portland, OR 2011/2012	Field	.093	.031	67%	ORTHO P

BACTERIA:

Description	Type	**Avg. Influent** (MPN)	Avg. **Effluent** (MPN)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	1600 / 1600	535 / 637	67% / 60%	Fecal / E. Coli
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	31666 / 6280	8667 / 1058	73% / 83%	Fecal / E. Coli

LEAD:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.54	.10	82%	Total
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.01 / .043	.004 / .014	60% / 68%	Both Test Units
TAPE Field Testing / Portland, OR 2011/2012	Field	.011	.003	70%	Total

All removal efficiencies and concentrations rounded up for easy viewing. Please call us for more information, including full copies of the reports reference above.

NITROGEN:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.85	.21	75%	NITRATE
TAPE Field Testing / Portland, OR 2011/2012	Field	1.40	0.77	45%	TKN

HYDROCARBONS:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	10	1.625	84%	Oils & Grease
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.83	0	100%	TPH Motor Oil
TAPE Field Testing / Portland, OR 2011/2012	Field	24.157	1.133	95%	Motor Oil

TURBIDITY:

Description	Type	Avg. **Influent** (NTU)	Avg. **Effluent** (NTU)	Removal **Efficiency**	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	21	1.575	93%	Field Measurement
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	21	6	71%	Field Measurement

COD:

Description	Type	Avg. **Influent** (mg/L)	Avg. **Effluent** (mg/L)	Removal **Efficiency**	Notes
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	516 / 1450	90 / 356	83% / 75%	Both Test Units

Modular Wetland System, Inc.
2972 San Luis Rey Rd
Oceanside, CA 92058

MODULAR WETLANDS
Nature & Technology Working Together In Perfect Harmony™

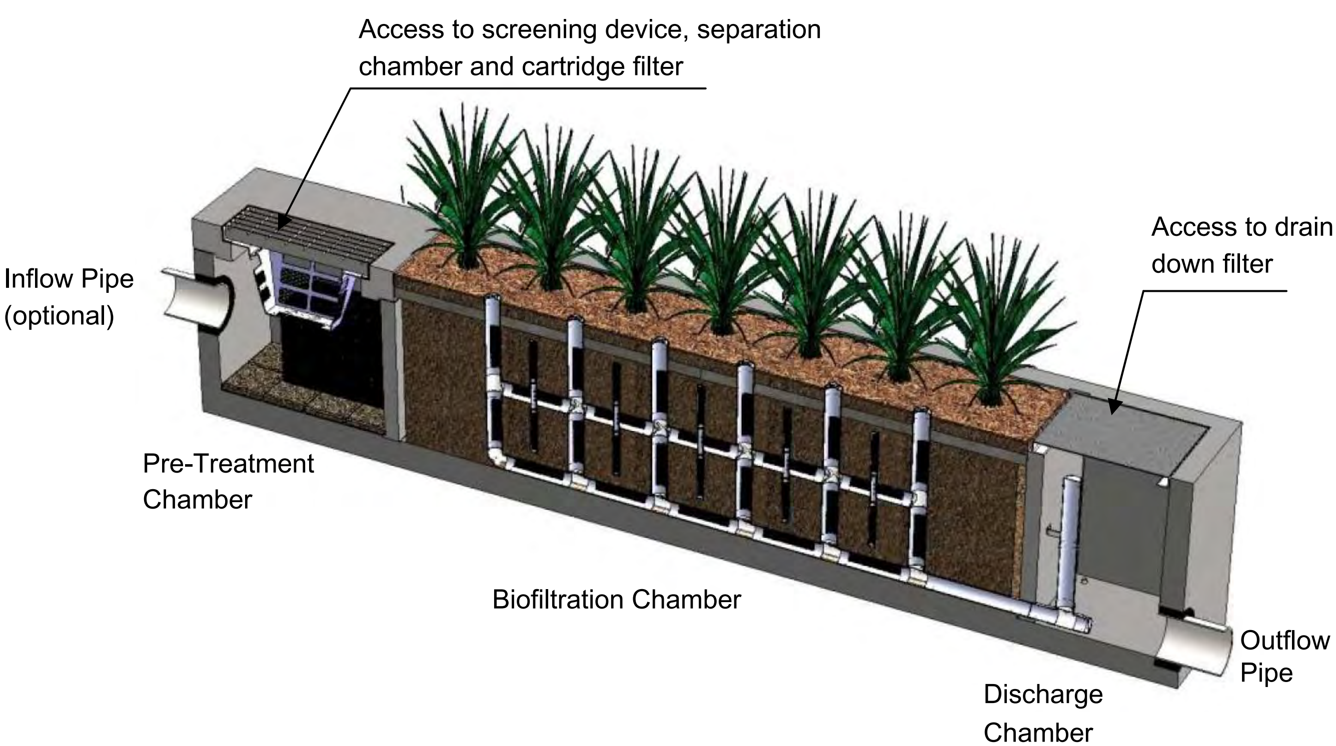
www.modularwetlands.com
P 760-433-7640
F 760-433-3179

Maintenance Guidelines for
Modular Wetland System - Linear

Maintenance Summary

- o <u>Remove Trash from Screening Device</u> – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- o <u>Remove Sediment from Separation Chamber</u> – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- o <u>Replace Cartridge Filter Media</u> – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- o <u>Replace Drain Down Filter Media</u> – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- o <u>Trim Vegetation</u> – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

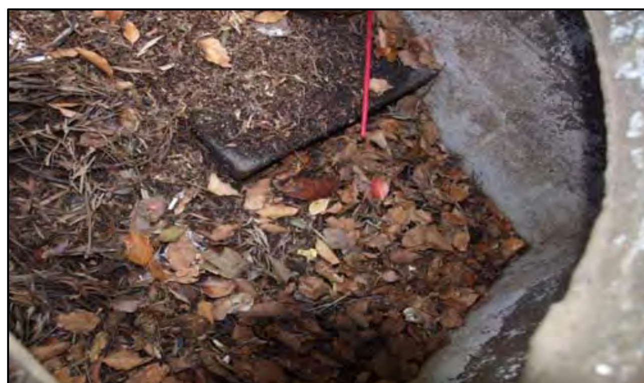
Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

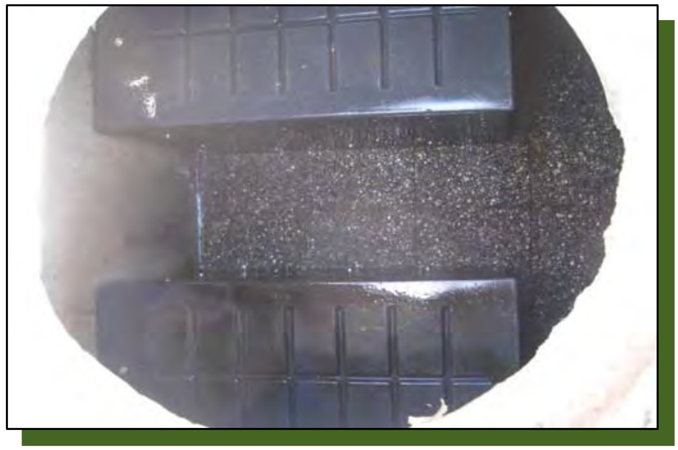
Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name ________________________________

Project Address ________________________________
(city) (Zip Code)

Owner / Management Company ________________________________

Contact ________________ Phone ( ) –

Inspector Name ________________ Date ___/___/_____ Time ________ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ________________ Additional Notes ________________

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): ________ Size (22', 14' or etc.): ________

Structural Integrity:	Yes	No	Comments
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

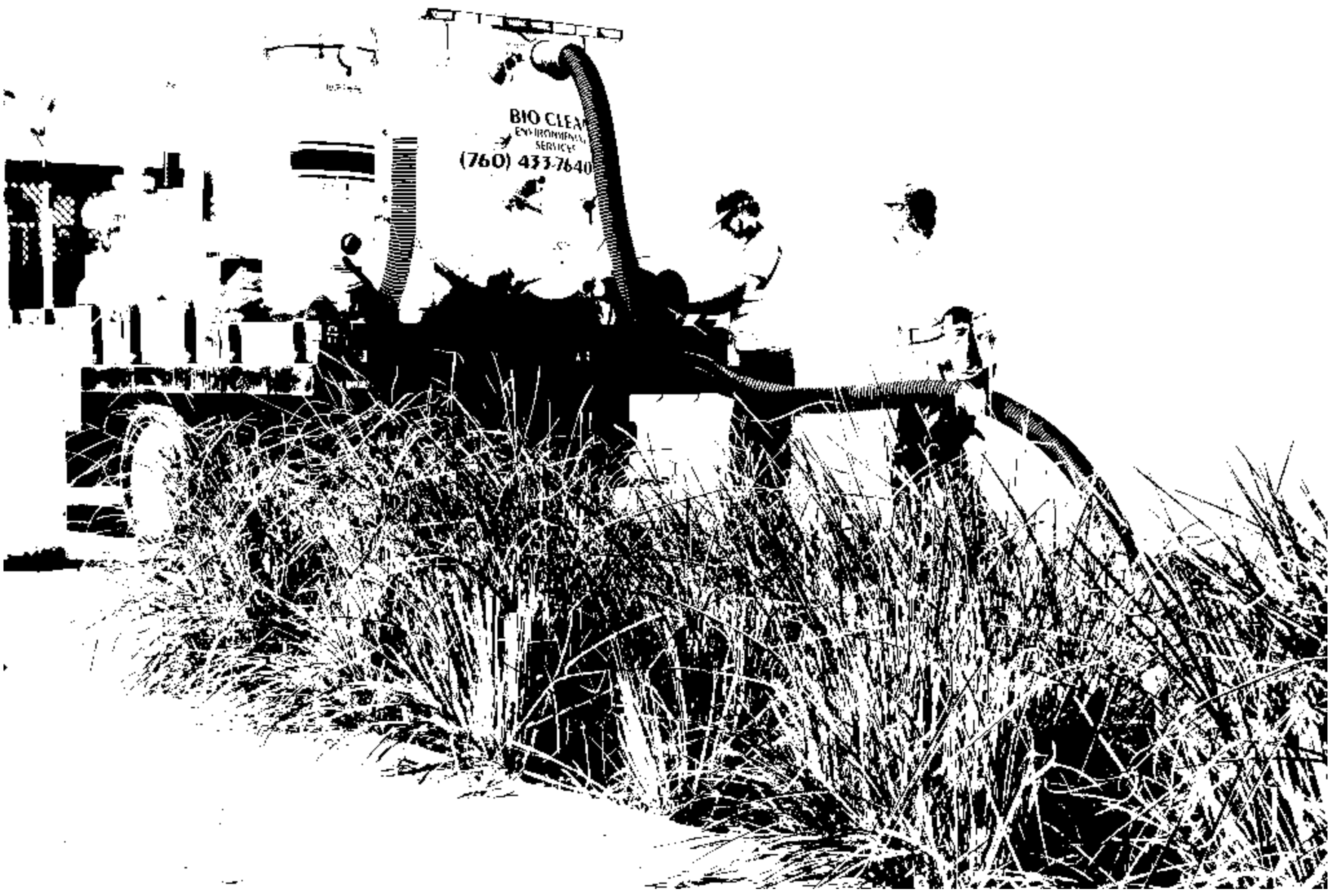
Waste:	Yes	No
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: ________________________________

Maintenance Report



Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name ______________________________

Project Address ______________________________
(city) (Zip Code)

Owner / Management Company ______________________________

Contact ______________________________ Phone ( ) –

Inspector Name ______________________________ Date ____/____/______ Time __________ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ______________________________ Additional Notes ______________________________

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Attachment 2
Backup for PDP Hydromodification Control Measures

This is the cover sheet for Attachment 2.

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

Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☑ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☑ Not Performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☐ Submitted as separate stand-alone document

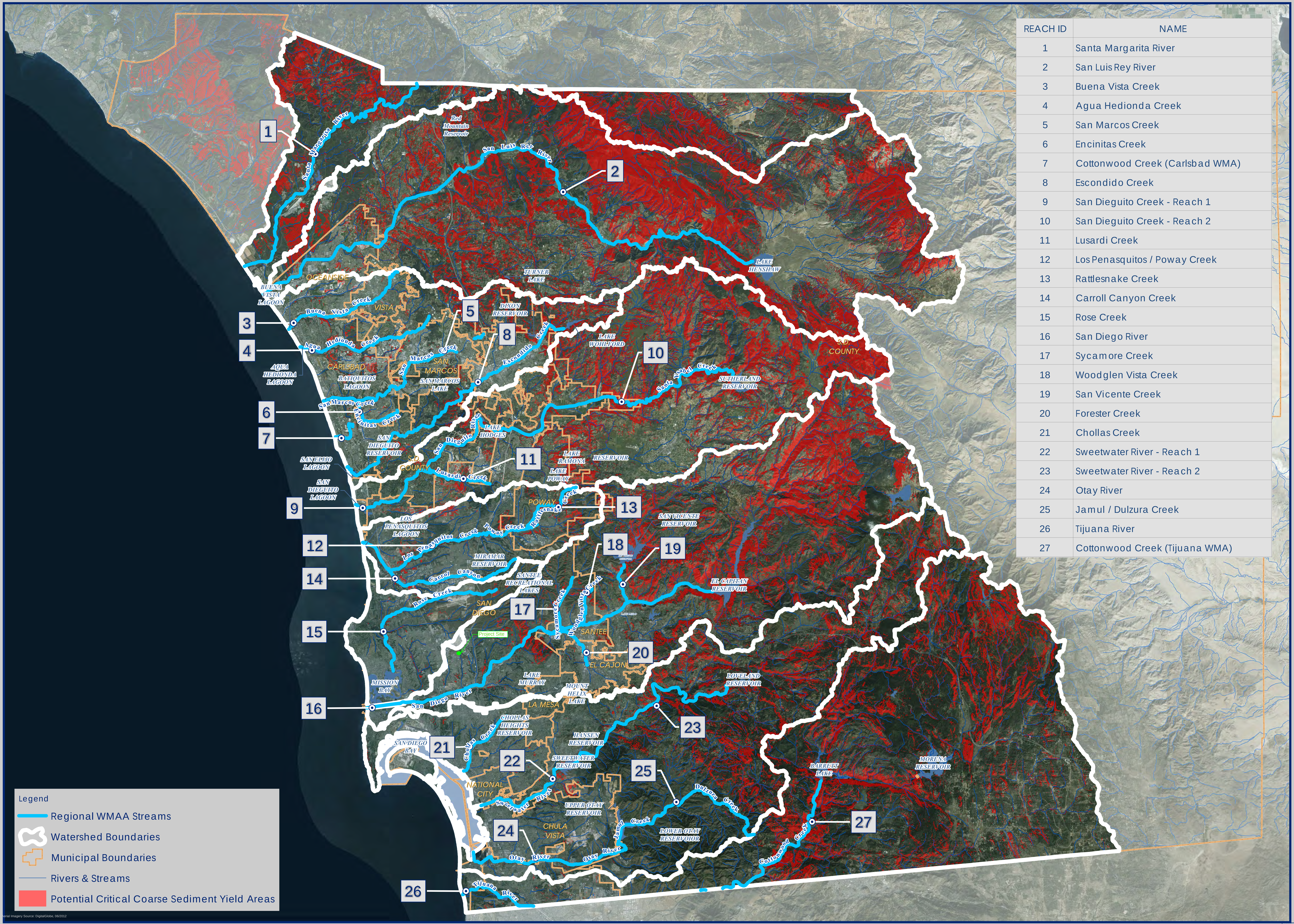
Project Name: San Diego Fire Rescue Air Facility – Montgomery Airport

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

The Hydromodification Management Exhibit must identify:

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

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING



REACH ID	NAME
1	Santa Margarita River
2	San Luis Rey River
3	Buena Vista Creek
4	Agua Hedionda Creek
5	San Marcos Creek
6	Encinitas Creek
7	Cottonwood Creek (Carlsbad WMA)
8	Escondido Creek
9	San Dieguito Creek - Reach 1
10	San Dieguito Creek - Reach 2
11	Lusardi Creek
12	Los Penasquitos / Poway Creek
13	Rattlesnake Creek
14	Carroll Canyon Creek
15	Rose Creek
16	San Diego River
17	Sycamore Creek
18	Woodglen Vista Creek
19	San Vicente Creek
20	Forester Creek
21	Chollas Creek
22	Sweetwater River - Reach 1
23	Sweetwater River - Reach 2
24	Otay River
25	Jamul / Dulzura Creek
26	Tijuana River
27	Cottonwood Creek (Tijuana WMA)

Potential Critical Coarse Sediment Yield Areas

Regional San Diego County Watersheds

Exhibit Date: Sept. 8, 2014

Geosyntec consultants
RICK ENGINEERING COMPANY

Attachment 3
Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 3	Maintenance Agreement (Form DS-3247) (when applicable)	☐ Included ☑ Not applicable

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

Attachment 3: For private entity operation and maintenance, Attachment 3 must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☑ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

MAINTENANCE

MWS – Linear

Hybrid Stormwater Filtration System

Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92049

www.modularwetlands.com
P 760-433-7640
F 760-433-3179

MAINTENANCE

Maintenance Summary –

- **<u>Clean Bio Clean® Catch Basin Filter</u> – average maintenance interval is 3 to 6 months.**
    - ***(15 minute service time).***

- **<u>Clean Separation (sediment) Chamber</u> – average maintenance interval is 6 to 18 months.**
    - ***(30 minute service time).***

- **<u>Replace Cartridge Filter Media (BioMediaGREEN™)</u> – average maintenance interval 6 – 12 months.**
    - ***(45 minute service time).***

- **<u>Replace Drain Down Filter Media (BioMediaGREEN™)</u> – average maintenance interval is 6 to 12 months.**
    - ***(5 minute service time).***

- **<u>Trim Vegetations</u> – average maintenance interval is 3 to 6 months.**
    - ***(15 minute service time).***

- **<u>Evaluate Wetland Media Flow Hydraulic Conductivity</u> – average inspection interval is once per year.**
    - ***(5 minute inspection time).***

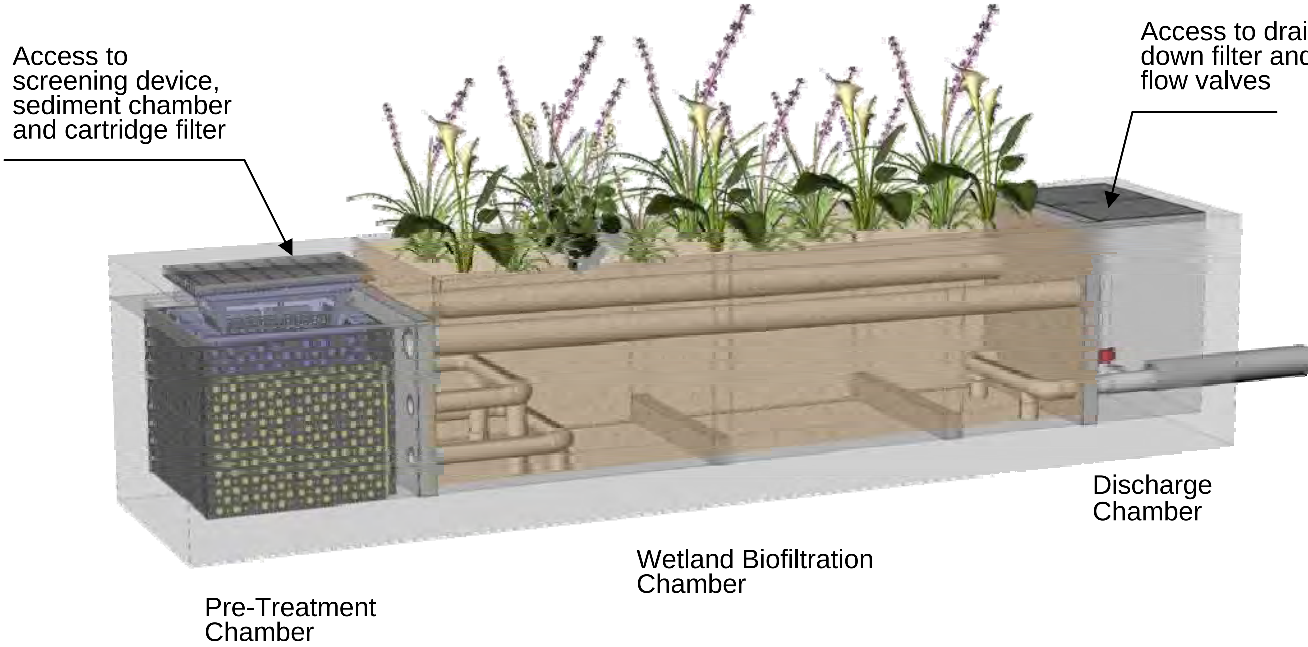
- **<u>Wetland Media Replacement</u> – average maintenance interval is 5 to 20 years.**
    - ***(6 hours).***

For more information on maintenance procedures, to order replacement media or find an authorized service company please contact:

Modular Wetland Systems, Inc
2972 San Luis Rey Road
Oceanside, CA 92058

Phone: 760-433-7640
Fax: 760-433-3176
Email: info@modularwetlands.com

System Diagram –



Maintenance Overview –

A. Every installed MWS – Linear unit is to be maintained by the Supplier, or a Supplier approved contractor. The cost of this service varies among providers.

B. The MWS – Linear is a multi-stage self-contained treatment train for stormwater treatment. Each stage protects subsequent stages from clogging. Stages include: screening, separation, cartridge media filtration, and biofiltration. The biofiltration stage contains various types of vegetation which will require annual evaluation and trimming.

> **1. <u>Clean Bio Clean® Catch Basin Filter</u> –** Screening is provided by well proven catch basin filter. The filter has a trash and sediment capacity of 2 (curb type) and 4 (grate type) cubic feet. The filter removes gross solids, including litter, and sediments greater than 200 microns. This procedure is easily done by hand or with a small industrial vacuum device. This filter is located directly under the manhole or grate access cover.
>
> **2. <u>Clean Separation (sediment) Chamber</u> –** separation occurs in the pre-treatment chamber located directly under the curb or grated inlet. This chamber has a capacity of approximately 21 cubic feet for trash, debris and sediments. This chamber targets TSS, and particulate metals and nutrients. This procedure can be performed with a standard vacuum truck. This chamber is located directly under the manhole or grate access cover.

3. <u>Replace Cartridge Filter Media (BioMediaGREEN™)</u> – Primary filtration is provided by a horizontal flow cartridge filter utilizing BioMediaGREEN blocks. Each cartridge has a media surface area of 35 square feet. The large surface area will insure long term operation without clogging. The cartridge filter with BioMediaGREEN targets fine TSS, metals, nutrients, hydrocarbons, turbidity and bacteria. Media life depends on local loading conditions and can easily be replaced and disposed of without any equipment. The filters are located in the pre-treatment chamber. Entry into chamber required to replace BioMediaGREEN blocks. Each cartridge contain 14 pieces of 20" tall BioMediaGREEN.

4. <u>Replace Drain Down Filter Media (BioMediaGREEN™)</u> – A drain down filter, similar in function to the perimeter filter is located in the discharge chamber. This filter allows standing water to be drained and filtered out of the separation chamber. This addresses any vector issues, by eliminating all standing water within this system. Replacement of media takes approximately 5 minutes and is performed without any equipment.

5. <u>Trim Vegetations</u> – The system utilizes multiple plants in the biofiltration chamber to provide enhanced treatment for dissolved pollutants including nutrients and metals. The vegetation will need to be maintained (trimmed) as needed. This can be done as part of the project normal landscape maintenance. **NO FERTILIZER SHALL BE USED IN THIS CHAMBER.**

<u>6. Evaluate Wetland Media Flow Hydraulic Conductivity</u> – The systems flow can be assessed from the discharge chamber. This should be done during a rain event. By viewing into the discharge chamber the flow out of the system can be observed. If little to know flow is observed from the lower valve or orifice plate this is a sign of potential wetland media (biofiltration) maintenance needs.

<u>7. Wetland Media Replacement</u> – biofiltration is provided by an advance horizontal flow vegetated wetland. This natural filter contains a mix of sorptive media that supports abundant plant life. This biofilter targets the finest TSS, dissolved nutrients, dissolved metals, organics, pesticides, oxygen demanding substances and bacteria. This filter provides the final polishing step of treatment. If prior treatment stages are properly maintained, the life of this media can be up to 20 years. Replacement of the media is simple. Removal of spent media can be done with a shovel of a vacuum truck.

C. The MWS – Linear catch basin filter, separation chamber, cartridge filter media and wetland media are designed to allow for the use of vacuum removal of captured pollutants and spent filter media by centrifugal compressor vacuum units without causing damage to the filter or during normal cleaning and maintenance. Filter and chambers can be cleaned from finish surface through standard manhole or grate access.

Maintenance Procedures –

1. <u>Clean Bio Clean® Catch Basin Filter</u> – Modular Wetland Systems, Inc. recommends the **catch basin filter** be inspected and cleaned a minimum of once every six months and replacement of hydrocarbon booms once a year. The procedure is easily done with the use of any standard vacuum truck. *This procedure takes approximately 15 minutes.*

1. Remove grate or manhole to gain access to catch basin filter insert. Remove the deflector shield (grate type only) with the hydrocarbon boom attached. Where possible the maintenance should be performed from the ground surface. Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training.
2. Remove all trash, debris, organics, and sediments collected by the inlet filter insert. Removal of the trash and debris can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screen of the filter.
3. Evaluation of the hydrocarbon boom shall be performed at each cleaning. If the boom is filled with hydrocarbons and oils it should be replaced. Attach new boom to basket with plastic ties through pre-drilled holes in basket. Place the deflector shield (grate type only) back into the filter.
4. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
5. The hydrocarbon boom may be classified as hazardous material and will have to be picked up and disposed of as hazardous waste. Hazardous material can only be handled by a certified hazardous waste trained person (minimum 24-hour hazwoper).

2. <u>Clean Separation (sediment) Chamber</u> – Modular Wetland Systems, Inc. recommends the **separation chamber** be inspected and cleaned a minimum of once a year. The procedure is easily done with the use of any standard vacuum truck. *This procedure takes approximately 30 minutes.*

1. Remove grate or manhole to gain access to the catch basin filter.
2. Remove catch basin filter. Where possible the maintenance should be performed from the ground surface. Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training.
3. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
4. Vacuum out separation chamber and remove all accumulated debris and sediments.
5. Replace catch basin filter, replace grate or manhole cover.
6. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

3. <u>Replace Cartridge Filter Media (BioMediaGREEN™)</u> – Modular Wetland Systems, Inc. recommends the **cartridge filters** media be inspected and cleaned a minimum of once a year. The procedure will require prior maintenance of separation chamber. *Replacement of media takes approximately 45 minutes.*

1. Remove grate or manhole to gain access to the catch basin filter.
2. Remove catch basin filter. Where possible the maintenance should be performed from the ground surface. Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training.
3. Enter separation chamber.
4. Unscrew the two ½" diameter bolts holding the lid on each cartridge filter and remove lid and place outside of unit.
5. Remove each of the 14 BioMediaGREEN filter blocks in each cartridge and remove from chamber for disposal.
6. Spray down the outside and inside of the cartridge filter to remove any accumulated sediments.
7. Replace with new BioMediaGREEN filter blocks insuring the blocks are properly lined up and seated in the bottom.
8. Replace the lid and tighten down bolts.
9. Replace catch basin filter, replace grate or manhole cover.
10. Transport all debris, trash, organics, spent media and sediments to approved facility for disposal in accordance with local and state requirements.

4. <u>Replace Drain Down Filter Media (BioMediaGREEN™)</u> – Modular Wetland Systems, Inc. recommends the **drain down filter** be inspected and maintained a minimum of once a year. *Replacement of media takes approximately 5 minutes.*

1. Open hatch of discharge chamber
2. Enter chamber, unlatch drain down filter cover.
3. Remove BioMediaGREEN filter block
4. Replace with new block, replace and latch cover.
5. Exit chamber, close and lock down the hatch.
6. Transport spent media to approved facility for disposal in accordance with local and state requirements.

5. <u>Trim Vegetations</u> – Modular Wetland Systems, Inc. recommends the plants/vegetation be inspected and maintained a minimum of once a year. It is also recommended that the plants receive the same care as other landscaped areas. **Note: No fertilizer is to be used on this area.** *Trimming of vegetation takes approximately 15 minutes.*

<u>6. Evaluate Wetland Media Flow Hydraulic Conductivity</u> – Modular Wetland Systems, Inc. recommends system flow be inspected and observed a minimum of once a year. This needs to be done during a rain event. *Inspection and Observation takes approximately 5 minutes.*

1. Open hatch of discharge chamber
2. Observe the level of flow from the bottom valve or orifice plate.
3. If flow is steady and high the system is operating normally.

4. If little or no flow is observed exiting the valve possible maintenance to the biofiltration wetland chamber may be needed. Contact Modular Wetlands for further assistance.
5. Exit chamber, close and lock down the hatch.

<u>7. Wetland Media Replacement</u> – Modular Wetland Systems, Inc. recommends the wetland media be replaced a minimum of one every 20 years. *Inspection takes approximately 15 minutes. Replacement of rock media takes approximately 6 hours and requires a vacuum truck.*

1. Remove plants from the wetland chamber.
2. Use a vacuum truck or shovel to remove all wetland media.
3. Spray down the walls and floor of the chamber and vacuum out any accumulated pollutants.
4. Spray down perforated piping and netting of flow matrix and the inflow and outflow end to remove any accumulated pollutants.
5. Vacuum out any standing water from the media removal and insure the chamber is cleaning.
6. Use a small backhoe to fill chamber with new media. Call Modular Wetland Systems, Inc. for media delivery information.
7. Install BioMediaGREEN filter blocks across over the entire filter bed. Fill with media until 9” from top. The install filter blocks which are 3” thick. Fill the top 6” inches with wetland media.
8. Plant new vegetation in the same configuration and quantity as old vegetation. Dig down until the BioMediaGREEN is exposed. Cut out a small circle of the BioMediaGREEN. Remove plant from container including soil ball and place in the whole cut out of the BioMediaGREEN. Cover up with wetland media.
9. Spray down the plants and media with water to saturate.
10. Continue supplemental irrigation (spray or drip) for at lest 90 days.

7. Other Maintenance Notes –

1. Following maintenance and/or inspection, the maintenance operator shall prepare a maintenance/inspection record. The record shall include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanism. .
2. The owner shall retain the maintenance/inspection record for a minimum of five years from the date of maintenance. These records shall be made available to the governing municipality for inspection upon request at any time.
3. Any person performing maintenance activities must have completed a minimum of OSHA 24-hour hazardous waste worker (hazwoper) training.
4. Remove access manhole lid or grate to gain access to filter screens and sediment chambers. Where possible the maintenance should be performed from the ground surface. Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training.
5. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
6. The hydrocarbon boom is classified as hazardous material and will have to be picked up and disposed of as hazardous waste. Hazardous material can only be handled by a certified hazardous waste trained person (minimum 24-hour hazwoper).

Maintenance Sequence –

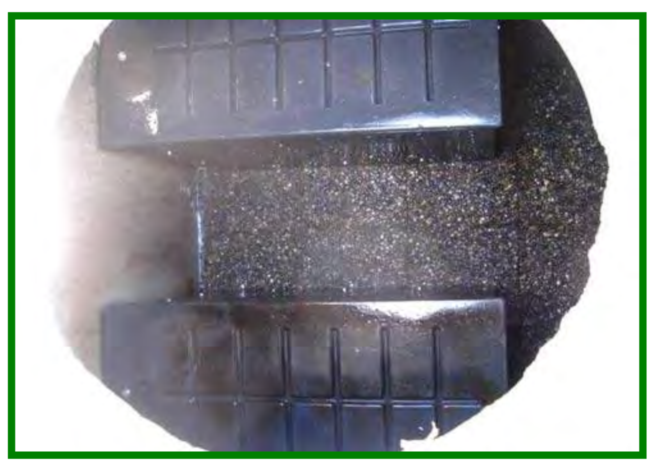
Access Pre-Treatment Chamber by Removing Manhole or Grate Cover

Assess Pollutant Loading in Catch Basin Filter and Sediment Chamber

Vacuum Catch Basin Filter

Remove Catch Basin Filter

Vacuum out the Sediment Chamber



Enter Chamber Remove Lids of Cartridge Filters

Remove Spent BioMediaGREEN Filter Blocks

Spray Down and Clean Cartridge Filter Housing

Replace with New BioMediaGREEN Filter Blocks and Replace Lid, then Catch Basin Filter and Replace Manhole or Grate

Open Discharge Chamber Lid to Asses Wetland Media Flow Rate and Replace Drain Down Filter Near Bottom

Evaluate Vegetation and Trim if Needed. Maintenance Complete.

Please Contact Modular Wetland Systems, Inc. for More Information:

760-433-7640

info@modularwetlands.com

Stormwater Management Fact Sheet: Bioretention

Description

Bioretention areas are landscaping features adapted to treat stormwater runoff on the development site. They are commonly located in parking lot islands or within small pockets in residential land uses. Surface runoff is directed into shallow, landscaped depressions. These depressions are designed to incorporate many of the pollutant removal mechanisms that operate in forested ecosystems. During storms, runoff ponds above the mulch and soil in the system. Runoff from larger storms is generally diverted past the facility to the storm drain system. The remaining runoff filters through the mulch and prepared soil mix. Typically, the filtered runoff is collected in a perforated underdrain and returned to the storm drain system. For more information see *Bioretention as a Water Quality Best Management Practice*, Article 110 in the Practice of Watershed Protection.

Applicability

Bioretention systems are generally applied to small sites, but can be applied to a wide range of development. Bioretention can be applied in many climate and geologic situations, with some minor design modifications.

Regional Applicability
Bioretention systems are applicable almost everywhere in the United States. In arid or cold climates, however, some minor design modifications may be needed.

Ultra Urban Areas
Ultra urban areas are densely developed urban areas in which little pervious surface exists. Bioretention facilities are ideally suited to many ultra urban areas, such as parking lots. While they consume a fairly large amount of space (approximately 5% of the area that drains to them), they can fit into existing parking lot islands or other landscaped areas.

Stormwater Hotspots
Stormwater hotspots are areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. A typical example is a gas station or convenience store parking lot. Bioretention areas can be used to treat stormwater hotspots as long as an impermeable liner is used at the bottom of the filter bed.

Stormwater Retrofit
A stormwater retrofit is a stormwater management practice (usually structural) put into place after development has occurred, to improve water quality, protect downstream channels, reduce flooding, or meet other objectives. Bioretention can be used as a stormwater retrofit, by modifying existing landscaped areas, or if a parking lot is being resurfaced. In highly urban watersheds, they are one of the few retrofit options that can be employed. However, it is very expensive to retrofit an entire watershed using bioretention areas since they treat small sites.

Cold Water (Trout) Streams
The species in cold water streams, notably trout, are extremely sensitive to changes in temperature. In order to protect these resources, designers should avoid treatment practices that increase the temperature of the stormwater runoff they treat. Bioretention is a good option in cold water streams because water ponds in them for only a short time, decreasing the potential for stream warming.

Siting and Design Considerations

Designers need to consider conditions at the site level and must incorporate design features to improve the longevity and performance of the practice, while minimizing the maintenance burden.

Siting
Some considerations selecting a stormwater treatment practice are the drainage area the practice will need to treat, the slopes both at the location of the practice and draining to it, soil and subsurface conditions, and the depth of the seasonably high groundwater table. Bioretention can be applied on many sites, with its primary restriction being the need to apply the practice on small sites.

Drainage Area

Bioretention areas should usually be used on small sites (i.e., five acres or less). When used to treat larger areas, they tend to clog. In addition, it is difficult to convey flow from a large area to a bioretention area.

Slope

Bioretention areas are best applied to relatively shallow slopes (usually about 5%). Sufficient slope is needed at the site to ensure that the runoff that enters a bioretention area can be connected with the storm drain system. It is important to note, however, that these bioretention areas are most often applied to parking lots or residential landscaped areas, which generally have gentle slopes.

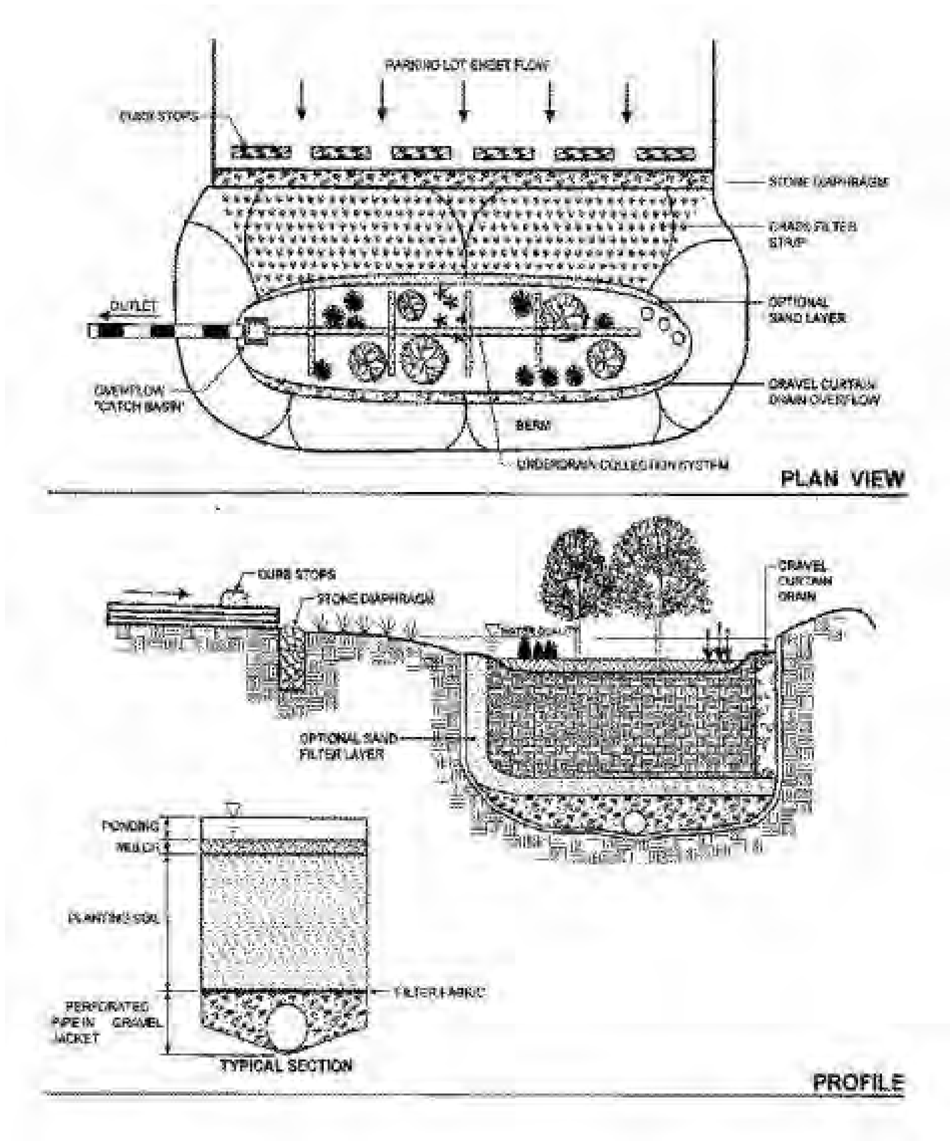
Soils /Topography

Bioretention areas can be applied in almost any soils or topography, since runoff percolates through a made soil bed, and is returned to the stormwater system.

Groundwater

Bioretention should be separated from the watertable to ensure that the groundwater never intersects with the bottom of the bioretention area, which prevents possible groundwater contamination and practice failure.

Design Considerations
Specific designs may vary considerably, depending on site constraints or preferences of the designer or community, but some features, should be incorporated into all bioretention areas. These design features can be divided into five basic categories: *pretreatment, treatment*, *conveyance*, *maintenance reduction*, and *landscaping (*for more information see the Manual Builder Category) (see Figure 1).



<u>Pretreatment</u>

Pretreatment refers to features of a bioretention area that capture and remove coarse sediment particles. Incorporating pretreatment helps to reduce the maintenance burden of bioretention, and reduces the likelihood that the soil bed will clog over time. Several different mechanisms are used to provide pretreatment in bioretention areas. Runoff can be directed to a grass channel or filter strip to settle out coarse sediments before the runoff flows into the filter bed of the bioretention area. Other features may include a pea gravel diaphragm, which acts to spread flow evenly and drop out larger particles.

<u>Treatment</u>

Treatment features enhance the ability of a stormwater treatment practice to remove pollutants. Several basic features should be incorporated into bioretention areas to enhance their pollutant removal rates. The bioretention system should be sized be between 5% and 10% of the impervious area draining to it. The practice should be designed with a soil bed that is a sand/ soil matrix with a mulch layer above the soil bed. The bioretention area should be designed to pond a small depth of water (6" to 9") above the filter bed.

<u>Conveyance</u>

Conveyance of stormwater runoff into and through a stormwater practice is a critical component of any stormwater treatment practice. Stormwater should be conveyed to and from the practice safely and minimize erosion potential.

Bioretention areas are designed with an underdrain system to collect filtered runoff at the bottom of the filter bed and direct it to the storm drain system. An underdrain is a perforated pipe in a gravel bed, installed along the bottom of filter bed. Stormwater management practices, and used to collect and remove filtered runoff. Designers should also provide an overflow structure to convey flow from large storms (that are not treated by the bioretention area) to the storm drain system.

Maintenance Reduction

In addition to regular maintenance, bioretention areas should incorporate design features to reduce the long term maintenance of a bioretention area. Designers should ensure that the bioretention area is easily accessible for maintenance.

Landscaping

Landscaping is critical to the function and appearance of bioretention areas. It is preferred that native vegetation is used for landscaping, where possible. Plants should be selected that can withstand the hydrologic regime they will experience (i.e., plants that tolerate both wet and dry conditions). At the edges, which will remain primarily dry, upland species will be the most resilient. Finally, it is best to select a combination of trees, shrubs, and herbaceous materials.

Design Variations

One design alternative to bioretention areas is the use of a "partial exfiltration" system, which promotes greater groundwater recharge (see below).

Partial Exfiltration

In this design variation, the underdrain of a bioretention area only is only installed on part of the bottom of the system. This design allows for greater infiltration of stormwater runoff, with the underdrain acting as more of an overflow. This system can be applied only when the soils and other characteristics are appropriate for infiltration (for more information see the Infiltration Trench and Infiltration Basin Fact Sheet in the Fact Sheet Category).

Arid Climates

In arid climates, bioretention areas should be landscaped with drought tolerant plant species.

Cold Climates

In cold climates, bioretention areas can be used as a snow storage area. When used for this purpose, or if used to treat parking lot runoff, the bioretention area should be planted with salt tolerant, and non-woody plant species.

Limitations

Bioretention areas have a few limitations. Bioretention areas cannot be used to treat large drainage areas, limiting their usefulness for some sites. Although bioretention areas do not consume a large amount of space, incorporating bioretention into a parking lot design may reduce the number of parking spaces available. Finally, the construction cost of bioretention areas relatively high compared with other stormwater treatment practices. (See *Cost Considerations* for a more detailed explanation).

Maintenance Considerations

Bioretention requires seasonal landscaping maintenance. In many cases, bioretention areas require intense maintenance initially to establish the plants, but less maintenance is required in the long term. In many cases, maintenance tasks can be completed by a landscaping contractor, who may already be hired at the site.

Table 1. Typical Maintenance Activities for Bioretention Areas

Activity	Schedule
• Remulch void areas • Treat diseased trees and shrubs	As needed
• Water plants daily for two weeks	At project completion
• Inspect soil and repair eroded areas • Remove litter and debris	Monthly
• Remove and replace dead and diseased vegetation	Twice per year
• Add additional mulch • Replace tree stakes and wire	Once per year

Effectiveness

Structural stormwater management practices can be used to achieve four broad resource protection goals. These include: *Flood Control, Channel Protection, Groundwater Recharge,* and *Pollutant Removal*. In general, bioretention areas can only provide pollutant removal.

Groundwater Recharge
Bioretention areas do not usually recharge the groundwater, except in the case of the partial exfiltration design (see *Design Variations*).

Pollutant Removal
Little pollutant removal data has been collected on the pollutant removal effectiveness of bioretention areas. In fact only one study has been conducted (Davis *et al*., 1998). The data from this study is presented in Table 2.

Table 2. Typical Pollutant Removal Rates of Bioretention Systems

Pollutant	Pollutant Removal (%)
TSS	81
TP	29
TN	49
NOx	38
Metals	51-71
Bacteria	-58

Assuming that bioretention systems perform similarly to swales, their removal rates are relatively high (for more information, see *Comparative Pollutant Removal Capability of Stormwater Treatment Practices*, Article 64 in The Practice of Watershed Protection).

Cost Considerations

Bioretention areas are relatively expensive. The following cost equation was developed by Brown and Schueler (1997), adjusting for inflation:

$C = 7.30\ V^{0.99}$

Where:
C = Construction, Design and Permitting Cost ($)
V = Volume of water treated by the facility (cubic feet)
This amounts to about $6.80 per cubic foot of water storage.

An important consideration when evaluating the costs of bioretention is that it often replaces area that would likely be landscaped anyway. Thus, the true cost of the bioretention area may be less than the construction cost reported. Similarly, maintenance costs for bioretention areas are not very different from normal landscaping maintenance. Land consumed by bioretention areas is relatively high compared with other practices (about 5% of the drainage area). However, this land should not be considered lost, since it is often fits with existing setbacks and landscaping requirements.

References

Brown, W. and T. Schueler. 1997. The Economics of Stormwater BMPs in the Mid-Atlantic Region. Prepared for: Chesapeake Research Consortium. Edgewater, MD. Center for Watershed Protection. Ellicott City, MD.

Center for Watershed Protection (CWP), Environmental Quality Resources and Loiederman Associates. 1998. Maryland Stormwater Design Manual. Prepared for: Maryland Department of the Environment. Baltimore, MD. http://www.mde.state.md.us/environment/wma/stormwatermanual/mdswmanual.html

Center for Watershed Protection (CWP). 1997. Stormwater BMP Design Supplement for Cold Climates. Prepared for: US EPA Office of Wetlands, Oceans and Watersheds. Washington, DC.

Center for Watershed Protection (CWP). 1996. Design of Stormwater Filtering Systems. Prepared for: Chesapeake Research Consortium. Solomons, MD. and US EPA Region V. Chicago, IL.

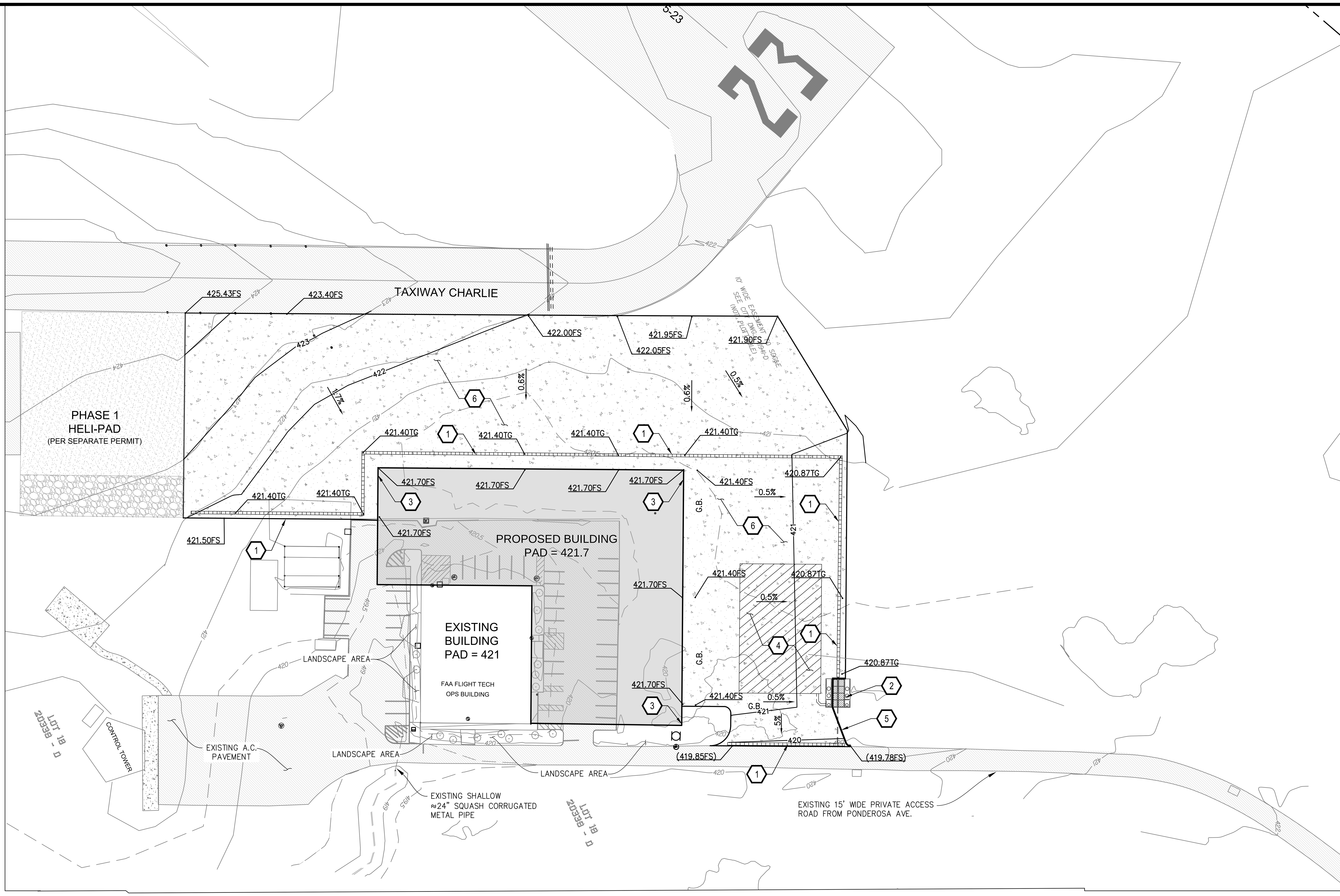
Davis, A., M. Shokouhian, H. Sharma, and C. Henderson. 1998. Optimization of Bioretention Design for Water Quality and Hydrologic Characteristics. Department of Civil Engineering, University of Maryland, College Park.

Engineering Technologies Associates and Biohabitats. 1993. Design Manual for Use of Bioretention in Stormwater Management. Prepared for: Prince George's County Government; Watershed Protection Branch. Landover, MD.

Prince George's County Department of Environmental Resources. 1997. Low Impact Development. Laurel, MD

Attachment 4
Copy of Plan Sheets Showing Permanent Storm Water BMPs

This is the cover sheet for Attachment 4.

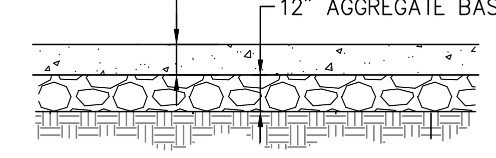


CONSTRUCTION NOTES

1. PROPOSED TRAFFIC RATED PRECAST TRENCH DRAIN.
2. PROPOSED MODULAR WETLAND SYSTEM
3. PROPOSED ROOF DOWN SPOUTS TO WQ AND HMP FACILITIES
4. PROPSOED UNDERGROUNG STORAGE FACILITY FOR 100% RETENTION OF 100 YEARS STORM FOR ALL PROPOSED IMPERVIOUS SURFACES
5. PROPOSED 6" CURB
6. PROPOSED 10" PCC PAVEMENT OVER 12" AGGREGATE BASE

SCALE: 1" = 40'

40 20 0 40 80 120



TYPICAL PAVEMENT SECTION 6

NO SCALE

ENGINEERING PERMIT NO:__________

DISCRETIONARY PERMIT NO:__________

PRIVATE CONTRACT

PRELIMINARY GRADING PLAN FOR:

AIR OPERATION HANGERS

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 1 OF 2 SHEETS

PROJECT NO.

FOR CITY ENGINEER | DATE

V.T.M.

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	AP			
AS-BUILTS				

XXXX-XXXX NAD83 COORDINATES

XXX-XXXX LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____

INSPECTOR ____ DATE COMPLETED ____

C-1

CONSTRUCTION CHANGE TABLE

CHANGE	DATE	EFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	PROJECT NO.

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

The City of SAN DIEGO

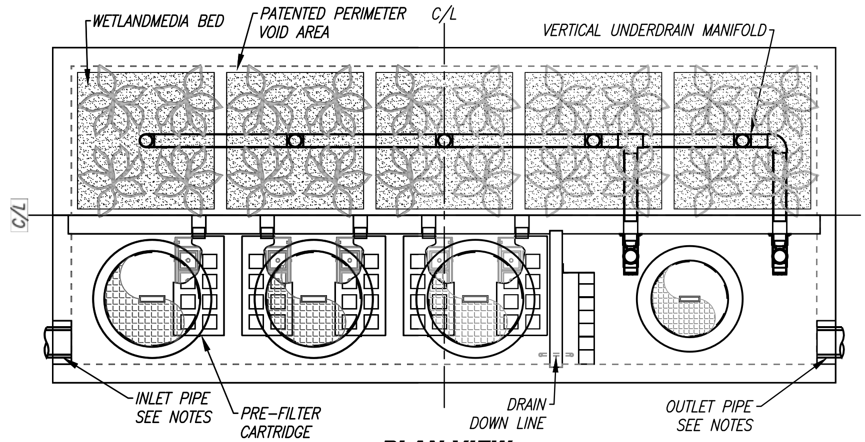
DEVELOPMENT SERVICES DEPARTMENT

(REV 3/01/2010)

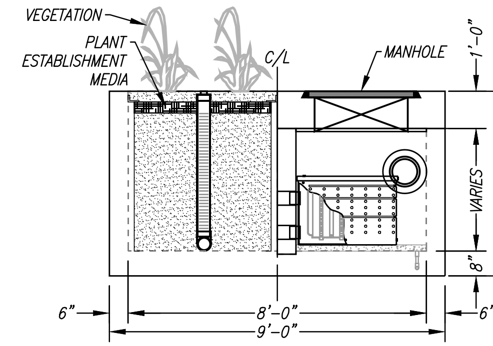
SAVE DATE: 11/4/2019 ~ PLOT DATE: 11/4/2019 ~ FILE NAME: F:\Project\Q74 - City of San Diego\Q74001002- Air Fire Rescue Facility\Design\CADD\Storm Analysis\Phase 2\18301 PGP Phase 2 (c&s).dwg

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.577	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	3EA ø30"	OPEN PLANTER	ø24"
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



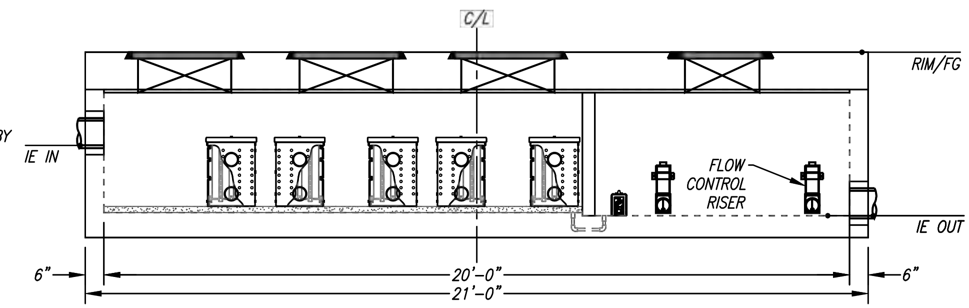
PLAN VIEW



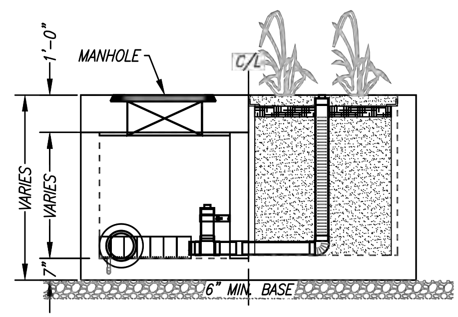
LEFT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURERS WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.



ELEVATION VIEW



RIGHT END VIEW

TREATMENT FLOW (CFS)	0.577
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

MODULAR WETLANDS

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

Bio Clean
A Forterra Company

MWS-L-8-20-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

5/23/19TOLFE

Attachment 6
Geotechnical and Groundwater Investigation Report

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

THIS PAGE INTENTIONALLY LEFT BLANK FOR DOUBLE-SIDED PRINTING

Preliminary Geotechnical Evaluation

San Diego Fire-Rescue Air Operations Hangars
Montgomery-Gibbs Executive Airport
San Diego, California

Platt/Whitelaw Architects, Inc.

4034 30th Street | San Diego, California 92104

September 6, 2018 | Project No. 108605001

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

Preliminary Geotechnical Evaluation

San Diego Fire-Rescue Air Operations Hangars
Montgomery-Gibbs Executive Airport
San Diego, California

Ms. Alison Whitelaw
Platt/Whitelaw Architects, Inc.
4034 30th Street | San Diego, California 92104

September 6, 2018 | Project No. 108605001

Nissa M. Morton, PG, CEG
Project Geologist

Jeffrey T. Kent, PE, GE
Principal Engineer

Kenneth H. Mansir, Jr., PE, GE
Principal Engineer

NMM/JTK/KHM/gg

Distribution: (1) Addressee (via e-mail)

CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

In accordance with your request, we have performed a preliminary geotechnical evaluation for the planned San Diego Fire-Rescue Air Operations Hangars project at the Montgomery-Gibbs Executive Airport located at 3750 John J. Montgomery Drive in San Diego, California (Figure 1). This report presents the results of our field explorations and laboratory testing as well as our conclusions regarding the geotechnical conditions at the site and our preliminary recommendations for use in project bridging documents and technical representation. We understand that design-build services, which will include additional subsurface evaluation, will be performed at a later date.

2 SCOPE OF SERVICES

Our scope of services for this evaluation included the following:

- Reviewing readily available published and in-house geotechnical literature including a previous geotechnical report for the adjacent Taxiway C (Ninyo & Moore, 2011a), topographic maps, geologic and geologic hazard maps, fault maps, flood zone maps, and stereoscopic aerial photographs.
- Performing a field reconnaissance to observe site conditions and to mark the locations of the exploratory borings.
- Notifying Underground Service Alert (USA) to clear excavation locations for the potential presence of underground utilities. In addition, a private utility locating company was used to clear the locations for the potential presence of underground utilities.
- Performing a subsurface exploration program consisting of the drilling, logging, and sampling of eight exploratory borings (B-1 through B-4 and IT-1 through IT-4). Relatively undisturbed drive and bulk soil samples of the materials encountered were collected at selected intervals from the borings and transported to our in-house geotechnical laboratory for testing.
- Performing infiltration tests in four of our borings to evaluate the infiltration rates of the underlying soils.
- Performing geotechnical laboratory testing of representative soil samples to evaluate soil characteristics and parameters for design purposes.
- Compiling and performing an engineering analysis of the information obtained from our background review, subsurface exploration, and laboratory testing.
- Preparing this geotechnical report presenting our preliminary findings, conclusions, and geotechnical recommendations for use in bridging documents for the eventual design and building of this project.

3 SITE AND PROJECT DESCRIPTION

The site is located within the Montgomery-Gibbs Executive Airport located at 3950 John J. Montgomery Drive in San Diego, California (Figure 1). The airport consists of three runways and various taxiways, buildings, and hangars. Other improvements include an air traffic control tower, a concrete helipad, and an operations building located in the northeast portion of the airport. An access road connects this area with Ponderosa Avenue to the northeast (Figure 2). The airport property is relatively level and elevations generally range from approximately 410 feet above mean sea level (MSL) in the southwestern portion of the site to approximately 425 feet above MSL in the eastern portion.

Based on our review of project information, including scoping documents and a project Feasibility Study (Atkins, 2017), as well as discussions with your office, we understand that the project will include the construction of new hangars and associated improvements in the vicinity of the existing operations building. Specifically, the project includes two new helicopter hangars, a concrete apron, a support building, a fueling station, parking areas, and a concrete helipad extension (Figure 2). In addition, the access road to Ponderosa Avenue will be improved and biofiltration basins may be constructed.

4 SUBSURFACE EXPLORATION

Our subsurface exploration was conducted on August 16 and August 17, 2018 and included the drilling, logging, and sampling of eight small-diameter borings (B-1 through B-4 and IT-1 through IT-4). Borings IT-1 through IT-4 were also used for infiltration testing. Prior to commencing the subsurface exploration, the locations were cleared of underground utilities of Underground Service Alert. In addition, a private utility locator was retained to locate existing utilities in the area of our exploratory borings. The purpose of the borings was to evaluate subsurface conditions and to collect soil samples for laboratory testing.

The borings were drilled to depths up to approximately 15 feet using manual equipment and a truck-mounted drill rig equipped with 8-inch diameter, continuous-flight, hollow-stem augers. Drilling refusal was encountered in three of our eight borings (B-1 through B-3). Ninyo & Moore personnel logged the borings in general accordance with the Unified Soil Classification System (USCS) by observing cuttings and drive samples. Representative bulk and in-place soil samples were collected at selected depths from within the exploratory borings and transported to our in-house geotechnical laboratory for analysis. The approximate locations of the borings are presented on Figure 2. The boring logs are presented in Appendix A.

Ninyo & Moore previously performed subsurface explorations within the Montgomery-Gibbs Executive Airport property for geotechnical evaluations associated with various runway and taxiway projects (Ninyo & Moore, 2004; 2008; 2011a; and 2011b). Information related to those evaluations are incorporated herein, as appropriate.

5 LABORATORY TESTING

Geotechnical laboratory testing was performed on representative soil samples collected during our subsurface exploration. This testing included an evaluation of in-situ moisture content, gradation, expansion index, soil corrosivity, and R-value. The results of the in-situ moisture content tests are presented at the corresponding depths on the boring logs in Appendix A. Descriptions of the geotechnical laboratory test methods and the results of the other geotechnical laboratory tests performed are presented in Appendix B.

6 INFILTRATION TESTING

Field infiltration testing was performed on August 16 and August 17, 2018 at locations selected by the project Civil Engineer. The infiltration test holes (IT-1 through IT-4) were excavated with a truck-mounted drill rig to depths of approximately 5 feet at the locations shown on Figure 2. The infiltration tests were performed in general accordance with the City of San Diego BMP Design Manual (2018). Approximately 2 inches of gravel was placed on the bottom of each prepared boring. A 2-inch diameter, perforated PVC pipe was installed in the boring and the annulus was then backfilled with pea gravel. As part of the test procedure, presoaking of each hole was performed on August 16, 2018 to represent adverse conditions for infiltration. The presoak consisted of maintaining approximately 1 foot of water in each boring for approximately 4 hours. The water level was then allowed to drop overnight. Infiltration testing was then performed in the presoaked test borings on August 17, 2018. Measurements of the water depth after infiltration were recorded approximately every thirty minutes. As necessary, the borings were refilled to maintain the water level until the infiltration rate stabilized.

Infiltration rates were calculated using the Porchet method. Based on the City of San Diego BMP Design Manual (2018), infiltration rates greater than 0.05 inches per hour and less than 0.5 inches per hour may be suitable for partial infiltration. Infiltration rates of 0.5 inches per hour or greater per hour may be considered suitable for full infiltration design. Infiltration rates less than 0.05 inches per hour are considered a no infiltration condition.

Our in-situ infiltration testing indicated that the water level within IT-1, IT-2, IT-3, and IT-4 generally remained constant over the 30 minute testing intervals and did not infiltrate. Accordingly, infiltration within the subsurface materials at IT-1, IT-2, IT-3, and IT-4 is not considered feasible. Based on the results of our infiltration testing, we recommend lining the sides of biofiltration basins with an impermeable liner or other hydraulic restricted layer. Infiltration test results and calculations are included in Appendix C. A completed Worksheet C.4-1: Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions with the appropriate geotechnical aspects is presented in Appendix C. Recommendations for placement, design, and construction of permanent stormwater BMPs are presented in Section 10.8 of this report.

Other areas of the site not specifically tested may or may not accommodate partial infiltration of storm water. Additional infiltration testing would be needed in these other areas to evaluate whether infiltration in these areas/depths are feasible. It is noted that the soils underlying the site are mapped by the Natural Resources Conservation Service (NCRS, 2018) as belonging to Hydrologic Soil Group D, which typically exhibits very slow infiltration rates. In addition, seasonal vernal pools, which are ephemeral pools of standing water, are present in the site vicinity. Based on these conditions, we anticipate that other areas of the site will also possess poor infiltration characteristics.

7 GEOLOGY AND SUBSURFACE CONDITIONS

Our findings regarding regional and site geology at the project location are provided in the following sections.

7.1 Regional Geologic Setting

The project area is situated in the coastal foothill section of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990; Harden, 2004). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults, which are shown on Figure 3, are considered active faults. The Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area and the Rose Canyon, Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project area. The Rose Canyon Fault Zone, the nearest active fault system, has been mapped approximately 4½ miles west of the project site. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. Further discussion of faulting relative to the site is provided in the Faulting and Seismicity section of this report.

7.2 Site Geology

Geologic units encountered during our field reconnaissance and subsurface exploration included fill, topsoils, and very old paralic deposits. Generalized descriptions of the earth units encountered during our subsurface exploration are provided below. The geology of the site vicinity is shown on Figure 4. Additional descriptions are provided on the boring logs in Appendix A.

7.2.1 Pavement Sections

Our exploratory borings B-1, IT-3, and IT-4 encountered pavement sections that consisted of asphalt concrete (AC) and aggregate base material underlain by fill materials and very old paralic deposits. Table 1 below summarizes the pavement sections as encountered in our borings.

Table 1 – Encountered Pavement Sections

Boring	AC thickness (inches)	Base Thickness (inches)
B-1	3½	3
IT-3	2½	3½
IT-4	2½	9½

7.2.2 Fill

Fill materials were encountered at the ground surface or underlying the pavement sections in borings B-1, B-4, and IT-3 to depths of up to 4 feet. Refusal was encountered in the fill material within B-1. As encountered, the fill soils generally consisted of brown and reddish brown, moist, loose to medium dense, clayey sand, and stiff, sandy clay. Gravel and cobbles were encountered within the fill materials. Documentation regarding placement of these fills was not available for review.

7.2.3 Topsoil

Topsoil was encountered at the ground surface in borings B-2, B-3, IT-1, and IT-2. In our borings, the topsoil was relatively thin and generally one-foot in thickness or less. As encountered, the topsoil materials generally consisted of brown, dry to moist, loose to medium dense, silty sand with roots.

7.2.4 Very Old Paralic Deposits

Materials of the middle to early Pleistocene-aged very old paralic deposits are mapped at the site (Figure 4; Kennedy and Tan, 2008), previously designated as the Lindavista Formation (Kennedy, 1975), and were encountered in borings B-2 through B-4 and IT-1 through IT-4 underlying the pavements, fill, and topsoil and extending to the total depths explored. As encountered, these materials generally consisted of reddish brown, olive brown, grayish brown, and gray, dry to moist, moderately to strongly cemented, silty and clayey sandstone. Cobbles were also encountered in the very old paralic deposits and drilling refusal within the very old paralic deposits occurred in three of our borings (B-1, B-2, and B-3).

7.3 Groundwater

Groundwater was not encountered in our exploratory borings. According to our review of readily available data from the Geotracker (2018) website, groundwater is anticipated at depths greater than 50 feet. Six borings were drilled to depths ranging from approximately 20 to 50 feet below the ground surface as part of an assessment by SCS Engineers (2008) of a former underground storage tank located approximately 15 feet west of the existing air traffic control tower. The assessment report by SCS (2008) indicated that the borings, which were drilled at roughly the same elevation as those performed in our evaluation, did not encounter groundwater. Existing utility trench lines may act as conduits for perched water conditions and seepage may be anticipated. Fluctuations in the groundwater level and perched conditions may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors. While surface water was not observed at the site during our exploration activities, seasonal vernal pools, which are ephemeral pools of standing water, are present in the site vicinity.

8 GEOLOGIC HAZARDS

In general, hazards associated with seismic activity include strong ground motion, ground surface rupture, and liquefaction. These considerations and other geologic hazards, such as landsliding and flooding, are discussed in the following section.

8.1 Faulting and Seismicity

Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject site is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively). However, like the majority of southern California, the site is located in a seismically active area and the potential for strong ground motion is considered significant during the design life of the proposed structures. The nearest known active fault is the Rose Canyon fault, located approximately 4½ miles west of the site. Table 2 lists selected principal known active faults that may affect the subject site, including the approximate fault-to-site distances, and the maximum moment magnitudes (Mmax) as published by the USGS (2018a).

Table 2 – Principal Active Faults

Fault	Approximate Fault-to-Site Distance miles (kilometers)	Maximum Moment Magnitude (Mmax)
Rose Canyon	4.5 (7.3)	6.9
Coronado Bank	18 (29)	7.4
Newport-Inglewood (Offshore)	29 (47)	7.0
Elsinore (Julian Segment)	36 (57)	7.4
Elsinore (Temecula Segment)	37 (59)	7.1
Earthquake Valley	40 (65)	6.8
Elsinore (Coyote Mountain)	48 (77)	6.9

In general, hazards associated with seismic activity include surface ground rupture, strong ground motion, and liquefaction. A brief description of these hazards and the potential for their occurrences on site are discussed below.

8.2 Surface Ground Rupture

Based on our review of the referenced literature and our field evaluation, no active faults are known to cross the project vicinity. Therefore, the potential for ground rupture due to faulting at the project site is considered low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

8.3 Strong Ground Motion

The 2016 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 horizontal peak ground acceleration (PGA) that corresponds to the MCE_R for the segments was calculated as 0.44g using the United States Geological Survey (USGS, 2018b) seismic design tool (web-based).

The 2016 CBC specifies that the potential for liquefaction and soil strength loss be evaluated, where applicable, for the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration with adjustment for site class effects in accordance with the American Society of Civil Engineers (ASCE) 7-10 Standard. The MCE_G peak ground acceleration is based on the geometric mean peak ground acceleration with a 2 percent probability of exceedance in 50 years. The MCE_G peak ground acceleration with adjustment for site class effects (PGA_M) was calculated as 0.45g using the USGS (USGS, 2018b) seismic design tool that yielded a mapped MCE_G peak ground acceleration of 0.414g for the site and a site coefficient (F_{PGA}) of 1.086 for Site Class D.

8.4 Liquefaction

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Based on the relatively dense nature of the very old paralic deposits encountered in our borings, it is our opinion that the potential for liquefaction to occur at the site is not a design consideration.

8.5 Geologic Hazard Map

Per the City of San Diego's Seismic Safety Study (2008), the project site is located within an area designated as Category 51, which is described as "Level mesas, underlain by terrace deposits and bedrock, nominal risk." A portion of the Seismic Safety Study map that includes the site and vicinity is presented in Figure 5.

8.6 Landslides

Our review of referenced geologic maps, literature, topographic maps, and stereoscopic aerial photographs, no landslides or indications of deep-seated landsliding underlie the subject site (Kennedy and Tan, 2008; Tan, 1995). In addition, no indications of landsliding were observed during our site reconnaissance or subsurface exploration. As such, the potential for significant large-scale slope instability at the site is not a design consideration.

8.7 Flood Hazards

Based on review of the Federal Emergency Management Agency Flood Insurance Rate Maps (FIRM), flood hazard mapping has not been published at the project site. Based on our review of maps indicating the presence of vernal pools on the site (Atkins, 2017), seasonal flooding may be anticipated.

9 CONCLUSIONS

Based on our review of the referenced background data, the subsurface exploration, and geotechnical laboratory testing, it is our opinion that construction of the proposed project is feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into subsequent evaluations for the design and construction of the project. In general, the following conclusions were made:

- The project site is generally underlain by fill, topsoil, and very old paralic deposits. The existing fill and topsoil are not considered suitable for structural support in their current condition. The very old paralic deposits encountered at the site are considered suitable for structural support.

- Groundwater was not encountered during our subsurface exploration that included borings that extended to a depth of approximately 15 feet. Perched conditions and fluctuations in groundwater may occur due to variations in ground surface topography, subsurface geologic structure, rainfall, irrigation, and other factors.

- Gravel and cobble were encountered in the very old paralic deposits and drilling refusal within the very old paralic deposits occurred in two of our borings (B-2 and B-3). Accordingly, the contractor for site development should anticipate encountering difficult excavation conditions that may require additional efforts including heavy ripping and/or coring for drilling operations.

- Soils derived from on-site excavations are anticipated to generate gravel, cobbles, and oversize pieces of cemented sandstone. On-site soils may be suitable for reuse as engineered fill, provided they are processed in accordance with the following recommendations. Additional processing and handling of materials including screening and/or crushing should be anticipated.

- The closest known active fault, the Rose Canyon fault, has been mapped approximately 4½ miles west of the site. No active faults are reported underlying the subject site. Therefore, potential for ground rupture due to faulting at the site is considered low.

- Field infiltration testing indicated that infiltration within the subsurface materials is not feasible. Recommendations for placement, design, and construction of permanent stormwater BMPs are presented herein.

- Results of our geotechnical laboratory testing indicate that the upper soils at the site possess a very low expansion potential. However, variability of onsite soils should be anticipated as soils possessing medium and high expansion potential were encountered in a previous evaluation for Taxiway C, located northwest of the project site (Ninyo & Moore, 2011a).

- Based on the results of our limited geotechnical laboratory testing presented in Appendix B, as compared to the Caltrans (2018) corrosion guidelines, the on-site soils would be classified as corrosive

- Additional evaluation should be performed by the design-build team.

10 PRELIMINARY RECOMMENDATIONS

The following preliminary recommendations are provided for the design and construction of the proposed project. These preliminary recommendations are based on our evaluation of the site geotechnical conditions and our assumptions regarding the planned development. Subsequent evaluations and the proposed construction should be performed in accordance with the requirements of applicable governing agencies including the Federal Aviation Administration (FAA) and the San Diego County Regional Airport Authority. As noted previously, our preliminary recommendations are intended for use in project bridging documents and technical representation. We understand that design-build services, which will include additional subsurface evaluation, will be performed at a later date.

10.1 Earthwork

In general, earthwork should be performed in accordance with the preliminary recommendations presented in this report.

10.1.1 Site Preparation

Site preparation should begin with the removal of existing improvements, vegetation, utility lines, asphalt, concrete, and other deleterious debris from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is generally not present. Clearing and grubbing should extend to the outside of the proposed excavation and fill areas. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed of at a legal dumpsite away from the project area, unless noted otherwise in the following sections.

10.1.2 Excavation Characteristics

The results of our background review and field exploration program indicate that the project site is underlain by fill, topsoils, and very old paralic deposits. Excavation of the on-site materials should be should be generally achievable with heavy-duty earth moving equipment in good working condition. However, as noted, drilling refusal was encountered in three of our borings. Due to the presence of cobbles and possible strongly cemented zones within the very old paralic deposits, some areas may require heavy ripping or mechanical rock breaking equipment. Excavations may generate oversized material and additional processing and handling of these materials, including screening and/or crushing, should be anticipated.

10.1.3 Remedial Grading for Structures

In order to provide suitable support for proposed settlement-sensitive structures, including the proposed hangars and building, we recommend that the existing undocumented fill soils within the limits of the structures be removed to competent very old paralic deposits. Based on the subsurface information in our exploratory borings within the building areas, the existing fill is anticipated to extend to depths of up to 4 feet within the project limits. However, the depth of removals may be deeper and should be evaluated in the field to confirm that existing fills have been removed. The removed materials may be processed and replaced as compacted fill. The lateral extent of these removals should be approximately 5 feet outside the limits of proposed settlement-sensitive structures, including foundations for attached overhangs, canopies, and other building appurtenances.

Subsequent to removal, the resulting surface should be scarified to a depth of approximately 6 inches, moisture conditioned, and recompacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557 prior to placing new fill. Once the resulting removal surface has been recompacted, the overexcavation should be backfilled with generally granular soils that possess a very low to low expansion potential (i.e., an expansion index [EI] less than 50).

10.1.4 Temporary Excavations

For temporary excavations, we recommend that the following Occupational Safety and Health Administration (OSHA) soil classifications be used:

Fill and Topsoil	*Type C*
Very Old Paralic Deposits	*Type B*

Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations. Temporary excavations should be constructed in accordance with OSHA recommendations. For trenches or other excavations, OSHA requirements regarding personnel safety should be met using appropriate shoring (including trench boxes) or by laying back the slopes to no steeper than 1.5:1 (horizontal to vertical) in fill and topsoil and 1:1 for very old paralic deposits. Temporary excavations that encounter seepage may be shored or stabilized 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.

10.1.5 Materials For Fill

Soils derived from on-site excavations are anticipated to generate gravel, cobbles, and oversize pieces of cemented sandstone. On-site soils may be suitable for reuse as engineered fill, provided they are processed in accordance with the following recommendations. Additional processing and handling of materials including screening and/or crushing should be anticipated. Engineered fill soils should possess an organic content of less than approximately 3 percent by volume (or 1 percent by weight). In general, engineered fill material should not contain rocks or lumps over approximately 3 inches in diameter, and not more than approximately 30 percent larger than ¾ inch. Oversize materials should be separated from material to be used for fill and removed from the site.

Imported fill material, if needed, should generally be granular soils with a very low to low expansion potential (i.e., an expansion index [EI] of 50 or less). Import material should also be non-corrosive in accordance with the Caltrans (2018) corrosion guidelines. Based on the Caltrans (2018) criteria, soil is classified as corrosive if one or more of the following conditions exist: chloride concentration of 500 ppm or greater, soluble sulfate concentration of 1,500 ppm or greater, an electrical resistivity of 1,100 ohm-centimeters or less, and a pH 5.5 or less. Materials for use as fill should be evaluated prior to filling or importing.

10.1.6 Compacted Fill

Prior to placement of compacted fill, the contractor should request an evaluation of the exposed ground surface by Ninyo & Moore. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 6 inches and watered or dried, as needed, to achieve moisture contents generally at or slightly above the optimum moisture content. The scarified materials should then be compacted to a relative compaction of 90 percent as evaluated in accordance with the ASTM D 1557. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify this office and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Fill materials should be moisture conditioned to generally at or slightly above the laboratory optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent within the soil mass.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve a moisture content generally at or slightly above the laboratory optimum, mixed, and then compacted by mechanical methods to a relative compaction of 90 percent as evaluated by ASTM D 1557. The upper 12 inches of the subgrade materials beneath vehicular pavements should be compacted to a relative compaction of 95 percent relative density as evaluated by ASTM D 1557. Successive lifts should be treated in a like manner until the desired finished grades are achieved. Where planned under airport pavements, fill should be placed per FAA guidelines.

10.1.7 Drainage

Roof, pad, and slope drainage should be conveyed such that runoff water is diverted away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.). Positive drainage adjacent to structures should be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 2 percent or steeper for a distance of 5 feet or more outside building perimeters, and further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site should be provided so that water is not permitted to pond. A gradient of 2 percent or steeper should be maintained over the pad area and drainage patterns should be established to divert and remove water from the site to appropriate outlets.

Care should be taken by the contractor during grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of grading should be maintained for the life of the project. The property owner and the maintenance personnel should be made aware that altering drainage patterns might be detrimental to foundation performance.

10.2 Seismic Design Parameters

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 3 presents the seismic design parameters for the site in accordance with the CBC (2016) guidelines and adjusted MCE spectral response acceleration parameters (USGS, 2018b).

Table 3 – 2016 California Building Code Seismic Design Criteria

Seismic Design Factors	Values
Site Class	D
Site Coefficient, F_a	1.098
Site Coefficient, F_v	1.631
Mapped Spectral Acceleration at 0.2-second Period, S_s	1.004g
Mapped Spectral Acceleration at 1.0-second Period, S_1	0.385g
Spectral Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.103g
Spectral Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.627g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	0.735g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.418g

10.3 Foundations

Based on our understanding of the proposed structures, we are providing the following recommendations. The proposed hangars and building may be supported on shallow, continuous and/or spread footings bearing on compacted fill or very old paralic deposits. 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.

10.3.1 Bearing Capacity

Shallow, spread or continuous footings supported on compacted fill or competent very old paralic deposits may be designed using an allowable bearing capacity of 3,000 pounds per square foot (psf). These allowable bearing capacities may be increased by one-third when considering loads of short duration such as wind or seismic forces. Footings should be designed and reinforced in accordance with the recommendations of the project structural engineer.

10.3.2 Lateral Resistance

For resistance to lateral loads when footings are supported in compacted fill or competent very old paralic deposits, we recommend an allowable passive pressure of 350 pounds per cubic foot (pcf) be used with an upper bound value of up to 3,500 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is more. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a coefficient of friction of 0.35 be used between soil and concrete. The lateral resistance values presented above may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.4 Pavements

Based on the results of our previous evaluations at Montgomery-Gibbs Executive Airport (Ninyo & Moore, 2004, 2008, 2011a, and 2011b), site soils have been classified as “cohesive” based on FAA guidelines. Laboratory testing performed as part of these previous evaluations indicated California Bearing Ratio (CBR) values at the site generally range from 3 to 14 for pavement subgrade with a relative compaction of 95 percent. CBR values were not assessed within the project limits during this evaluation. CBR values should be evaluated during design-build services in accordance with applicable FAA specifications.

10.5 Preliminary Access Road Pavement Design

Our laboratory testing indicated the site soils along the access road to Ponderosa Avenue possess an R-value of 13. Accordingly, we have used a design R-value of 13 and Traffic Indices (TI) of 6 and 7 for the basis of preliminary design of flexible pavements for the access road. However, actual pavement recommendations should be based on R-value tests performed on bulk samples of the soils exposed at the finished subgrade elevations following grading operations. We recommend that the geotechnical consultant re-evaluate the pavement design at the time of construction. The recommended preliminary flexible pavement sections for the access road are presented in the table below.

Table 4 – Recommended Preliminary Flexible Pavement Sections			
Traffic Index (Pavement Usage)	Design R-Value	Asphalt Concrete (in)	Class 2 Aggregate Base (in)
6 (Drive Aisles)	13	4	10
7 (Fire Lanes and Delivery Routes	13	5	12

These values assume traffic indices of seven or less for site pavements. In addition, we recommend that the upper 12 inches of the subgrade and aggregate base materials be compacted to a relative compaction of 95 percent relative density as evaluated by the current version of ASTM D 1557. The AC materials should be compacted to a relative compaction of 95 percent as evaluated by the materials Hveem density. If traffic loads are different from those assumed, the pavement design should be re-evaluated.

10.5.1 Subgrade Stabilization

Due to the relatively impermeable nature of the very old paralic deposits, we anticipate that perched groundwater may be present in some areas. Due to the potential presence of perched groundwater or wet subgrade soils, excavations may encounter yielding subgrade conditions. Mitigation measures may include the removal and replacement of the wet soils or stabilization through a combination of aggregate base material reinforced with geogrid or geotextiles. Specific recommendations should be based on conditions exposed in the field during construction and evaluated on a case-by-case basis.

10.6 Soil Corrosivity

Laboratory testing was performed on a representative sample of the near-surface soil 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. The chloride content test was performed in general accordance with CT 422. Sulfate testing was performed in general accordance with CT 417.

The results of the corrosivity testing indicated an electrical resistivity of 880 ohm-centimeters (ohm-cm), a soil pH of 8.6, a chloride content of 400 parts per million (ppm), and a sulfate content of 0.011 percent (i.e., 110 ppm). A comparison with the Caltrans corrosion (2018) criteria indicates that the on-site soils would be classified as corrosive. Based on the Caltrans (2018) criteria, a project site is classified as corrosive if one or more of the following conditions exist for the representative soil samples retrieved from the site: chloride concentration of 500 ppm or greater, soluble sulfate concentration of 1,500 ppm or greater, an electrical resistivity of 1,100 ohm-centimeters or less, and a pH 5.5 or less.

10.7 Concrete

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. A soil samples tested during this evaluation indicated a water-soluble sulfate content of 0.011 percent (i.e., 110 ppm). Based on the ACI 318 criteria, the potential for sulfate attack is considered negligible for water-soluble sulfate contents in soil ranging from 0 to 0.10 percent by weight (0 to 1,000 ppm), indicating that soils underlying the site may be considered to have a negligible potential for sulfate attack. However, due to the potential for variability of on-site soils, we recommend that Type II, II/V, or V cement be used for concrete in contact with soil.

10.8 Permanent Stormwater BMPs

We understand that the project will include construction of BMP devices to satisfy the City of San Diego Stormwater requirements. As presented in Section 6, the results of in-situ testing of the underlying materials indicate that infiltration within the subsurface soils at IT-1, IT-2, IT-3, and IT-4 is not feasible. Based on the relatively impermeable nature of the very old paralic deposits, it is anticipated that lateral movement of infiltrating water will affect surrounding improvements including underground utility trenches, pavement subgrades, and foundation elements. Therefore, we recommend that permanent biofiltration basins be lined with an impermeable liner to restrict the movement of water to nearby improvements. The permanent biofiltration basins should be equipped with a drain to an appropriate outlet.

11 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses 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.

12 REFERENCES

American Concrete Institute (ACI), 2014, ACI 318 Building Code Requirements for Structural Concrete and Commentary.

American Society of Civil Engineers (ASCE), 2010, Minimum Design Loads for Buildings and Other Structures, ASCE 7-10.

Anderson, J.G., Rockwell, T.K., and Agnew, D.C., 1989, Past and Possible Future Earthquakes of Significance to the San Diego Region: Earthquake Engineering Research Institute (EERI), Earthquake Spectra, Volume 5, No. 2.

Atkins, 2017, San Diego Fire Department Hangar Feasibility Study, City of San Diego: dated March 24.

Building News, 2018, "Greenbook," Standard Specifications for Public Works Construction: BNI Publications.

California Building Standards Commission (CBSC), 2016, California Building Code (CBC), Title 24, Part 2, Volumes 1 and 2.

California Department of Transportation (Caltrans), 2018, Corrosion Guidelines (Version 3.0), Division of Engineering and Testing Services, Corrosion Technology Branch: dated March.

California Geological Survey, 2008 (revised), Earthquake Shaking Potential for California: Map Sheet 48.

City of San Diego, 1963a, Topographic Survey, Sheet 234-1725, Scale 1:2,400.

City of San Diego, 1963b, Topographic Survey, Sheet 238-1725, Scale 1:2,400.

City of San Diego, 1978a, Orthotopographic Survey, Sheet 234-1725, Scale 1:2,400.

City of San Diego, 1978b, Orthotopographic Survey, Sheet 238-1725, Scale 1:2,400.

City of San Diego, 2008, Seismic Safety Study, Grid 26, Scale 1:9,600.

City of San Diego, 2018, BMP Design Manual, Storm Water Requirements for Development Applications.

County of San Diego Hazard Mitigation Planning – Liquefaction Draft, SanGIS 2009.

GeoTracker, 2018, http://geotracker.waterboards.ca.gov/; accessed in August.

Google Inc., 2018, https://www.google.com/earth/; accessed in August.

Harden, D.R., 2004, California Geology, Second Edition: Prentice Hall, Inc.

Hart, E.W., and Bryant, W.A., 1997, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps: California Geological Survey, Special Publication 42, with Supplements 1 and 2 added in 1999.

Kennedy, M.P., and Tan, S.S., 2008, Geologic Map of the San Diego 30' x 60' Quadrangle, California, California Geologic Survey, Regional Geologic Map No. 3, Scale 1:100,000.

Kennedy, M.P., 1975, Geology of the La Jolla Quadrangle, San Diego, California, Scale 1:24,000.

Natural Resources Conservation Service (NRCS), 2018, Web Soil Survey, National Cooperative Soil Survey, https://websoilsurvey.sc.egov.usda.gov: accessed July 30.

Ninyo & Moore, in-house proprietary data.

Ninyo & Moore, 2004, Geotechnical Evaluation Report, Montgomery Field CIP Projects, San Diego, California, Project No. 105304001: dated September 23.

Ninyo & Moore, 2008, Geotechnical Evaluation, Runway 10L-28R Rehabilitation, Montgomery Field Airport, San Diego, California, Project No. 106461001: dated November 21.

Ninyo & Moore, 2011a, Geotechnical Evaluation, Montgomery Field Airport, Taxiway C Rehabilitation and Run-Up Pad Extension, San Diego, California, Project No. 107020003: dated April 8.

Ninyo & Moore, 2011b, Geotechnical Evaluation, Montgomery Field Airport, Runway 5-32 and Taxiways E and G Rehabilitation Project, San Diego, California, Project No. 107027001: dated August 30.

Ninyo & Moore, 2018, Proposal for Geotechnical Services, San Diego Fire-Rescue Air Operations Hangars, Montgomery-Gibbs Executive Airport, San Diego, California: Proposal No. 02-01218: dated January 31.

Norris, R.M. and Webb, R.W., 1990, Geology of California, Second Edition: John Wiley & Sons, Inc.

Platt/Whitelaw Architects, Inc., 2018, Scoping Document, San Diego Fire-Rescue Air Operations Hangars, Montgomery Airfield, San Diego: dated January 23.

SCS Engineers, 2008, Additional Site Assessment Report for Montgomery Field Air Traffic Control Tower, 4298 Ponderosa Avenue, San Diego, California: dated April 2.

Tan, 1995, Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California, Open-File Report 95-03, Scale 1:24,000.

United States Geological Survey, 1967, La Jolla Quadrangle 7.5 minute, San Diego County, California.

United States Geological Survey, 1996, La Jolla Quadrangle 7.5 minute, San Diego County, California.

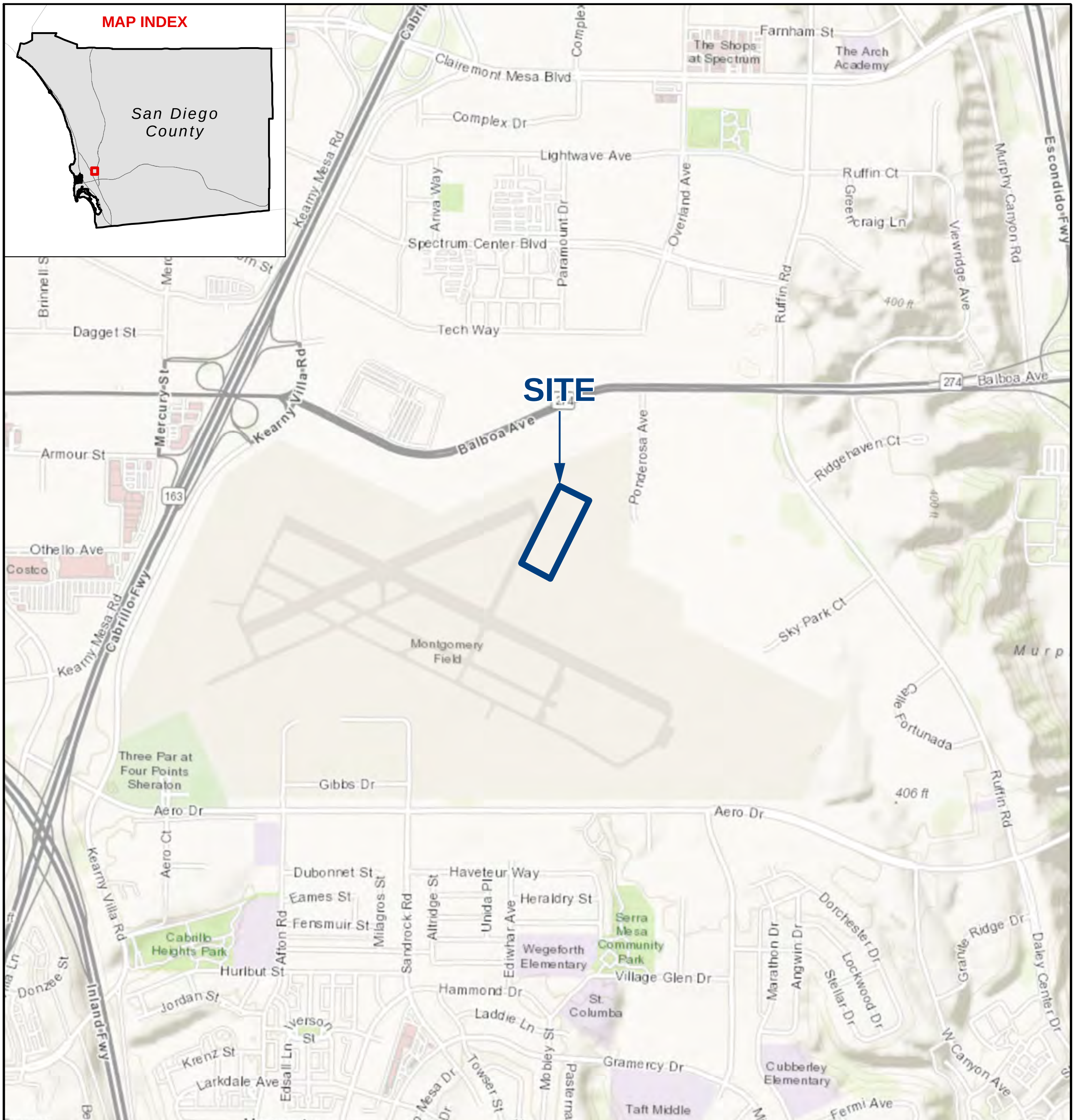
United States Federal Emergency Management Agency (FEMA), 2018, Flood Map Service Center, https://msc.fema.gov/: accessed August.

United States Geological Survey (USGS), 2018a, 2008 National Seismic Hazard Maps - Fault Parameters website, https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm.

United States Geological Survey (USGS), 2018b, U.S. Seismic Design Maps website, https://earthquake.usgs.gov/designmaps/us/application.php.

United Stated Department of Agriculture, 1953, Flight AXN-3M, Numbers 189 and 190, Scale 1:20,000: dated March 31.

FIGURES



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: ESRI WORLD TOPO, 2017

1_108605001_SL.mxd 9/4/2018 AOB

FIGURE 1

SITE LOCATION

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

SOURCE: ATKINS, 2017.
GOOGLE EARTH, 2017

LEGEND

B-4 TD=15.2	BORING TD=TOTAL DEPTH IN FEET
IT-4 TD=5.0	INFILTRATION TEST TD=TOTAL DEPTH IN FEET

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

N

FEET
0 120 240

2_108605001_BL.mxd 9/6/2018 AOB

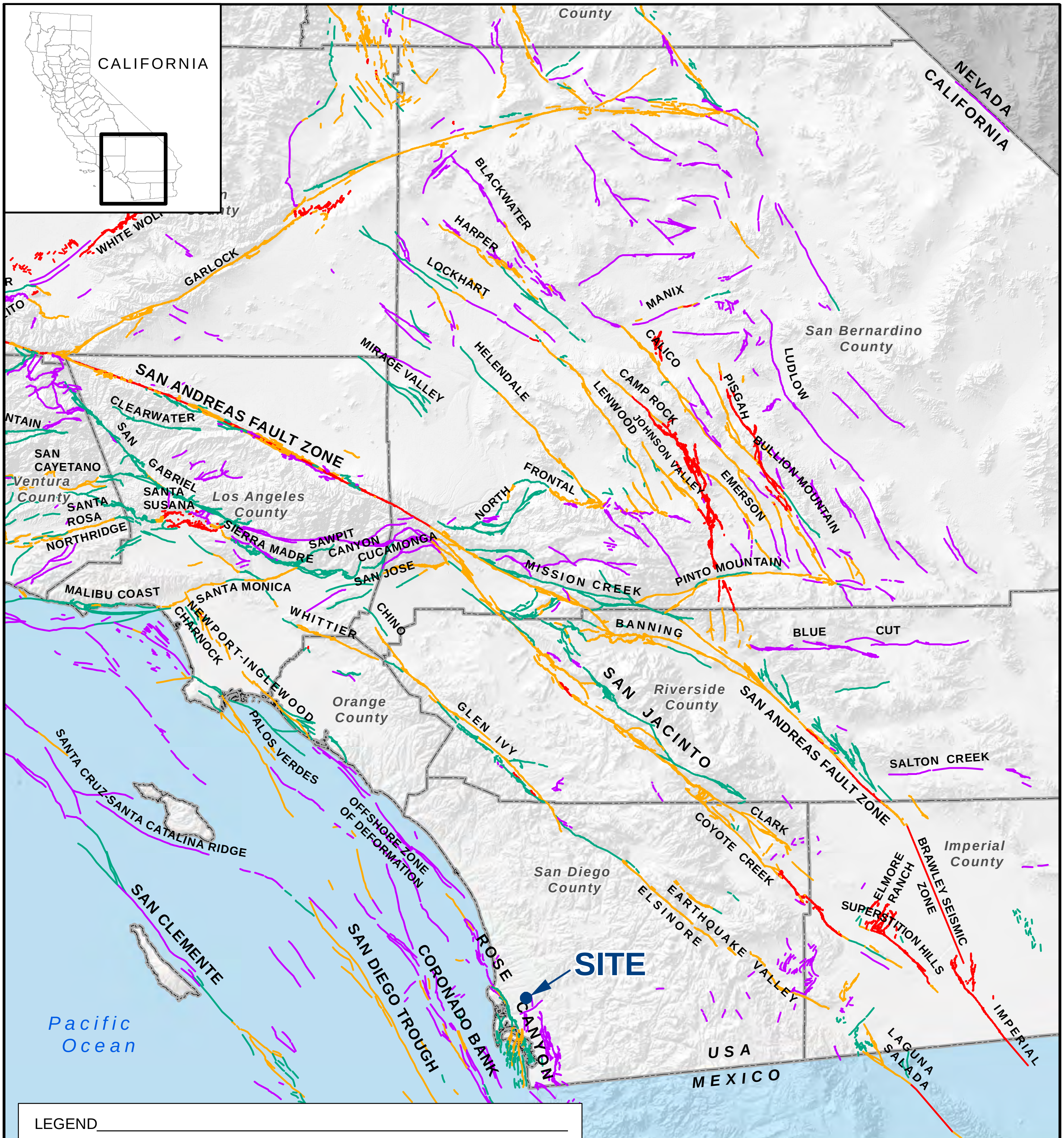
FIGURE 2

BORING LOCATIONS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



LEGEND

CALIFORNIA FAULT ACTIVITY

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- STATE/COUNTY BOUNDARY

SOURCE: U.S. GEOLOGICAL SURVEY AND CALIFORNIA GEOLOGICAL SURVEY, 2006, QUATERNARY FAULT AND FOLD DATABASE FOR THE UNITED STATES.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

3_108605001_FL.mxd 9/4/2018 AOB

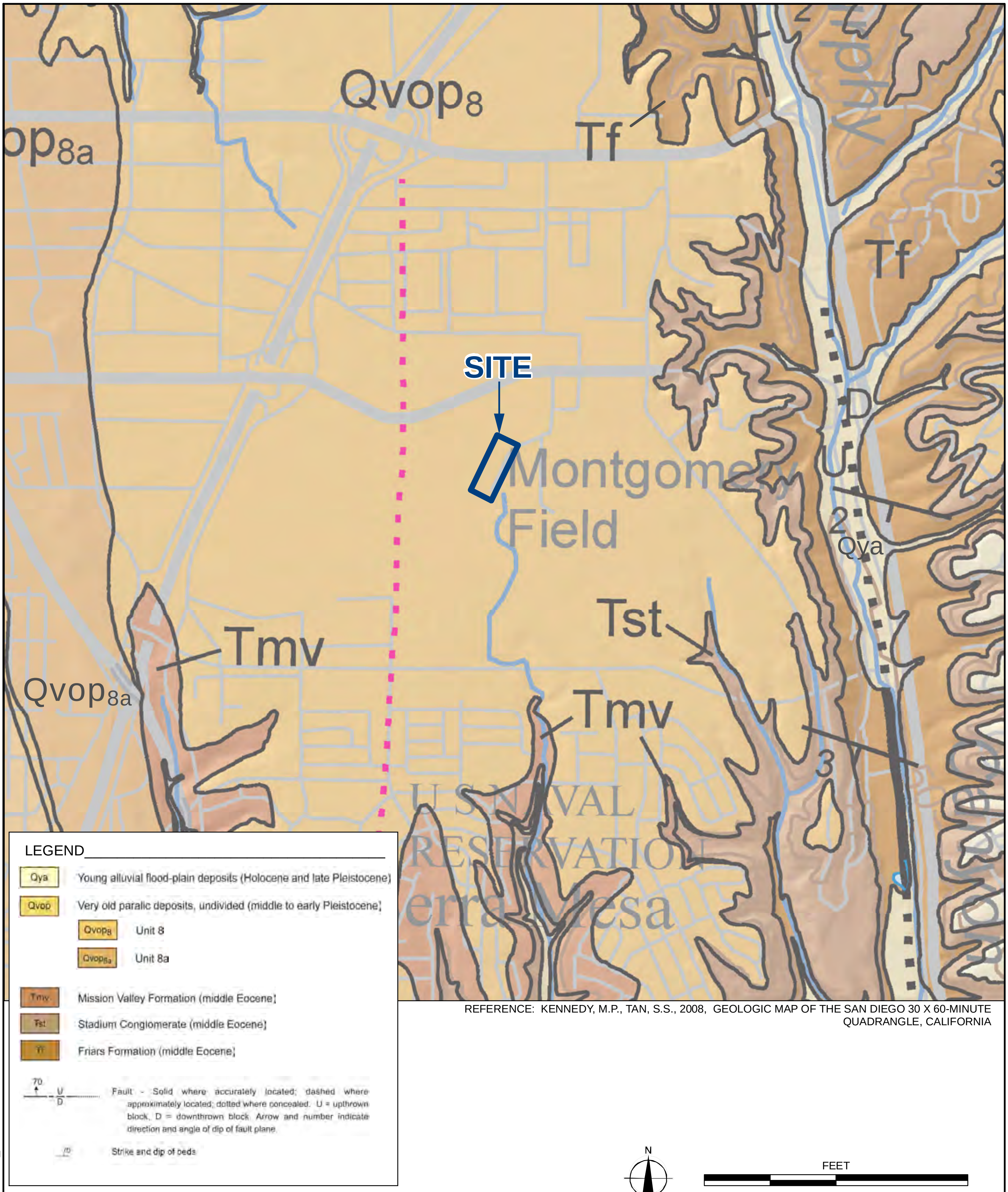
FIGURE 3

FAULT LOCATIONS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



REFERENCE: KENNEDY, M.P., TAN, S.S., 2008, GEOLOGIC MAP OF THE SAN DIEGO 30 X 60-MINUTE QUADRANGLE, CALIFORNIA

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

4_108605001_G.mxd 9/5/2018 AOB

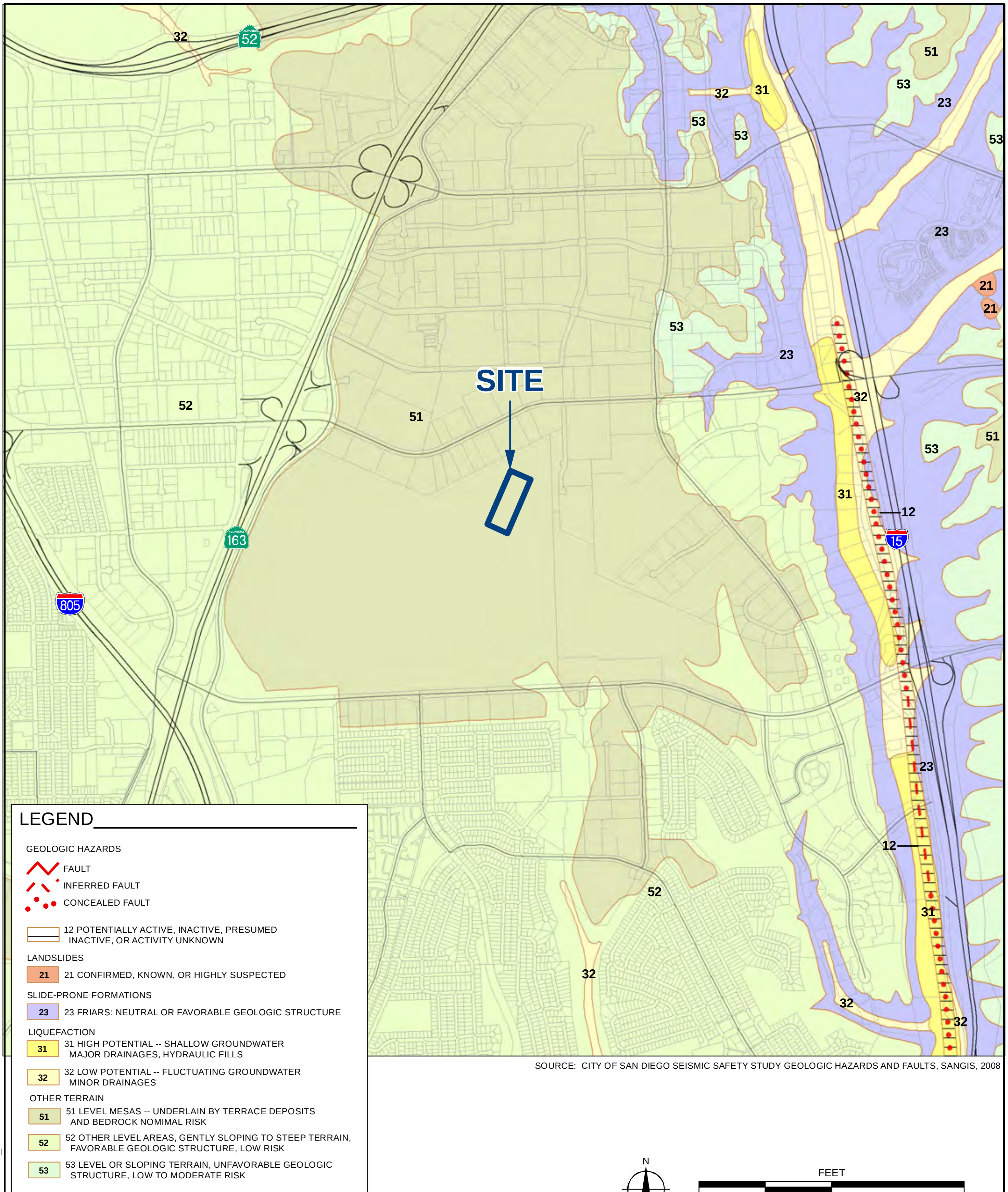
FIGURE 4

GEOLOGY

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants



SOURCE: CITY OF SAN DIEGO SEISMIC SAFETY STUDY GEOLOGIC HAZARDS AND FAULTS, SANGIS, 2008

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

5_108605001_GH.mxd 9/5/2018 AOB

FIGURE 5

GEOLOGIC HAZARDS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

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 methods.

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 1⅜ inches. The sampler was driven into the ground with a 140-pound hammer free-falling 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.

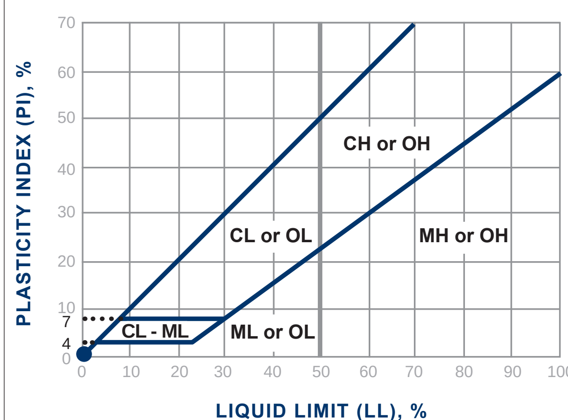
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions: Group Symbol	Secondary Divisions: Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 200 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
		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: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: 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

Consistency	Spooling Cable or Cathead: SPT (blows/foot)	Spooling Cable or Cathead: Modified Split Barrel (blows/foot)	Automatic Trip Hammer: SPT (blows/foot)	Automatic Trip Hammer: 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

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

USCS METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								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
15								
								The total depth line is a solid line that is drawn at the bottom of the boring.
20								

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/16/18 BORING NO. B-1 GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Core/Manual DRIVE WEIGHT N/A DROP N/A SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM **DESCRIPTION/INTERPRETATION**
0								ASPHALT CONCRETE: Approximately 3-1/2 inches thick.
							GC	AGGREGATE BASE: Brown, moist, medium dense, clayey GRAVEL; approximately 3 inches thick.
							CL	FILL: Reddish brown to olive, moist, stiff, sandy CLAY; scattered gravel and cobbles.
								Total Depth = 2.5 feet. (Refusal) Groundwater not encountered during. Backfilled and patched shortly after drilling on 8/16/18. 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.
5								
10								
15								
20								

DATE DRILLED 8/16/18 BORING NO. B-2

GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	TOPSOIL: Brown, dry to moist, medium dense, silty SAND; scattered roots.
1	X							VERY OLD PARALIC DEPOSITS: Reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE; few gravel and cobbles.
3	X			24.4				
5		X	50/3"	5.4				Dry to moist.
7								@ 7': Some gravel.
10		X	50/2"					
11								Cobbles; difficult drilling.
12								Total Depth = 12 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 8/16/18.
								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.
15								
20								

DATE DRILLED	8/16/18	BORING NO.	B-3
GROUND ELEVATION	420' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-95) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip)	DROP	30"
SAMPLED BY	GSW	LOGGED BY GSW	REVIEWED BY NMM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	TOPSOIL: Brown, moist, medium dense, silty SAND; scattered roots.
	X			10.5				VERY OLD PARALIC DEPOSITS: Reddish brown to gray, moist, moderately cemented, clayey fine- to medium-grained SANDSTONE; few gravel and cobbles.
5		X	66/11"	15.2				
10		X	50/6"					Grayish brown. Cobbles; difficult drilling.
15								Total Depth = 13 feet. (Refusal) Groundwater not encountered during drilling. Backfilled shortly after drilling on 8/16/18. 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.
20								

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/16/18 BORING NO. B-4
								GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1
								METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)
								DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30"
								SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM
								DESCRIPTION/INTERPRETATION
0	■						SC	FILL: Brown to reddish brown, moist, medium dense, clayey SAND; scattered gravel and roots.
	■			9.9				
								VERY OLD PARALIC DEPOSITS: Reddish brown, moist, strongly cemented, silty fine- to medium-grained SANDSTONE; few gravel and cobbles.
5		■	50/3"	7.8				
10		■	50/2"					Cobbles; difficult drilling.
15		■	50/2"					
								Total Depth = 15.2 feet. Groundwater not encountered during drilling. Backfilled shortly after drilling on 8/16/18. 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.
20								

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	<u>TOPSOIL:</u> Brown, dry to moist, medium dense, silty SAND; scattered roots.
								<u>VERY OLD PARALIC DEPOSITS:</u> Reddish brown, dry to moist, moderately cemented, silty fine- to medium-grained SANDSTONE; few gravel and cobbles.
5								Total Depth = 5 feet. Groundwater not encountered. Backfilled shortly after testing on 8/17/18. <u>Note:</u> 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.
10								
15								
20								

DATE DRILLED 8/16/18 BORING NO. IT-1

GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/16/18 BORING NO. IT-2 GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1 METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja) DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30" SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM **DESCRIPTION/INTERPRETATION**
0							SM	<u>TOPSOIL:</u> Brown, dry to moist, medium dense, silty SAND; scattered roots.
								<u>VERY OLD PARALIC DEPOSISTS:</u> Reddish brown, dry to moist, moderately cemented, silty fine- to medium-grained SANDSTONE.
5								Total Depth = 5 feet. Groundwater not encountered. Backfilled shortly after testing on 8/17/18. <u>Note:</u> 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.
10								
15								
20								

DATE DRILLED	8/16/18	BORING NO.	IT-3
GROUND ELEVATION	420' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger (CME-95) (Baja)		
DRIVE WEIGHT	140 lbs. (Auto-Trip)	DROP	30"
SAMPLED BY	GSW	LOGGED BY GSW	REVIEWED BY NMM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 2-1/2 inches thick.
							GC	AGGREGATE BASE: Brown, moist, medium dense, clayey GRAVEL; approximately 3-1/2 inches thick.
							SC	FILL: Brown, moist, loose to medium dense, clayey SAND; few cobbles.
								VERY OLD PARALIC DEPOSITS: Reddish brown, moist, moderately cemented, silty fine- to medium-grained SANDSTONE; trace gravel and cobbles.
5								Total Depth = 5 feet. Groundwater not encountered. Backfilled and patched shortly after testing on 8/17/18.
10								
15								
20								

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.

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.

DATE DRILLED 8/16/18 BORING NO. IT-4

GROUND ELEVATION 420' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger (CME-95) (Baja)

DRIVE WEIGHT 140 lbs. (Auto-Trip) DROP 30"

SAMPLED BY GSW LOGGED BY GSW REVIEWED BY NMM

DESCRIPTION/INTERPRETATION

0

GC

ASPHALT CONCRETE:
Approximately 2-1/2 inches thick.

AGGREGATE BASE:
Brown, moist, medium dense, clayey GRAVEL; approximately 9-1/2 inches thick.

VERY OLD PARALIC DEPOSITS:
Reddish brown, moist, moderately cemented, silty fine- to medium-grained SANDSTONE; few gravel and cobbles.

5

Total Depth = 5 feet.
Groundwater not encountered.
Backfilled and patched shortly after testing on 8/17/18.

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.

10

15

20

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 Tests
The moisture contents 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.

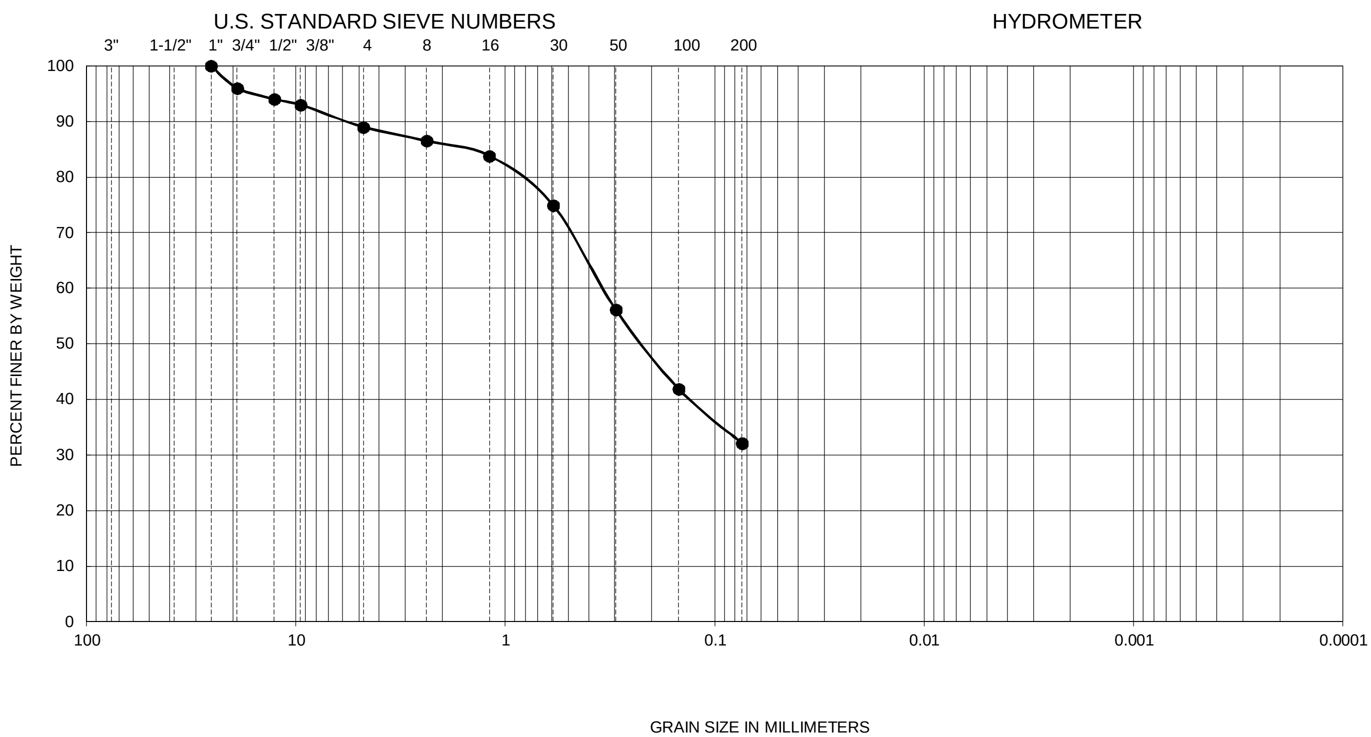
Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain size distribution curves are shown on Figures B-1 through B-3. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

Expansion Index Tests
The expansion indices of selected materials were evaluated in general accordance with ASTM D 4829. The specimens were molded under a specified compactive energy at approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimens were loaded with a surcharge of 144 pounds per square foot and were inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of the tests are presented on Figure B-4.

Soil Corrosivity Tests
Soil pH and electrical resistivity tests were performed on a representative sample in general accordance with CT 643. The sulfate and chloride contents of the selected sample were evaluated in general accordance with CT 417 and 422, respectively. The results of these tests are presented on Figure B-5.

R-Value
The resistance value (R-value) for site soils was evaluated in general accordance with CT 301. Samples were prepared and evaluated for exudation pressure and expansion pressure. The equilibrium R-value is reported as the lesser or more conservative of the two calculated results. The test results are presented in Figure B-6.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-3	1.0-5.0	--	--	--	--	--	--	--	--	32	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

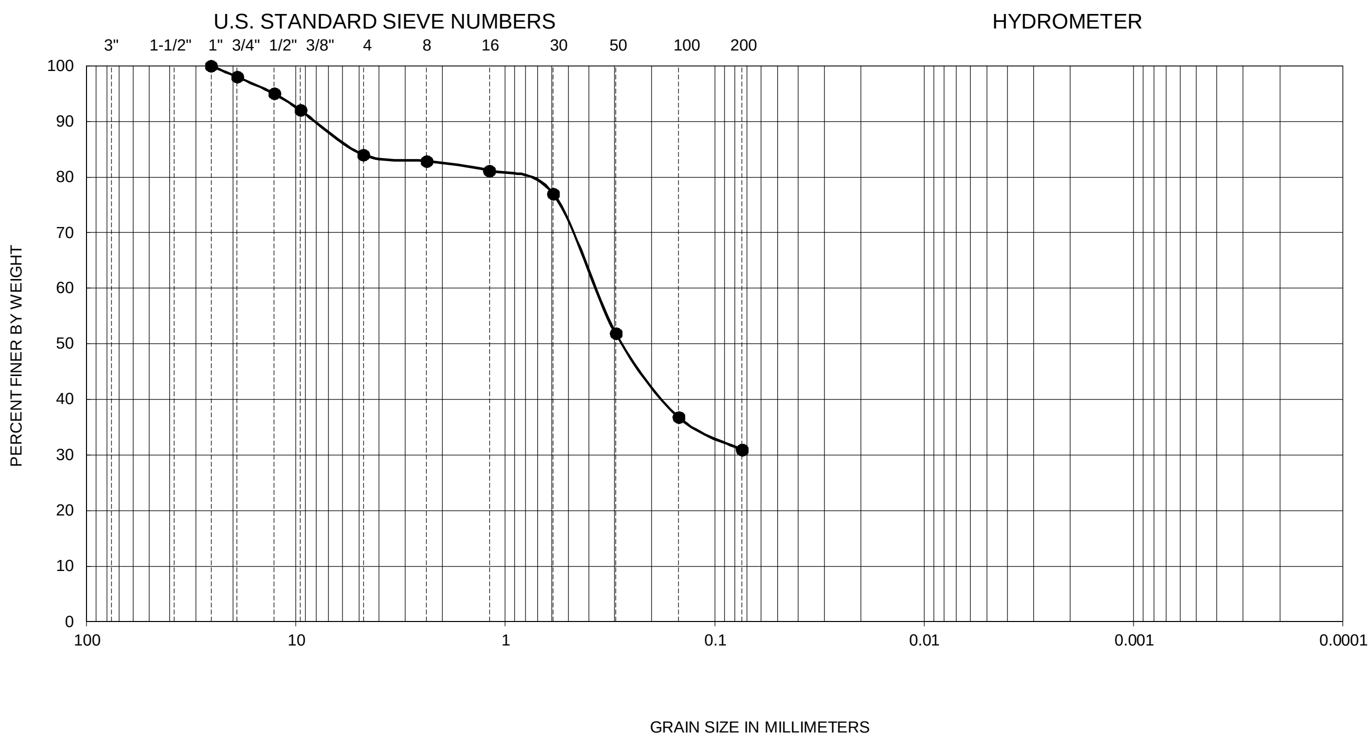
FIGURE B-1

GRADATION TEST RESULTS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

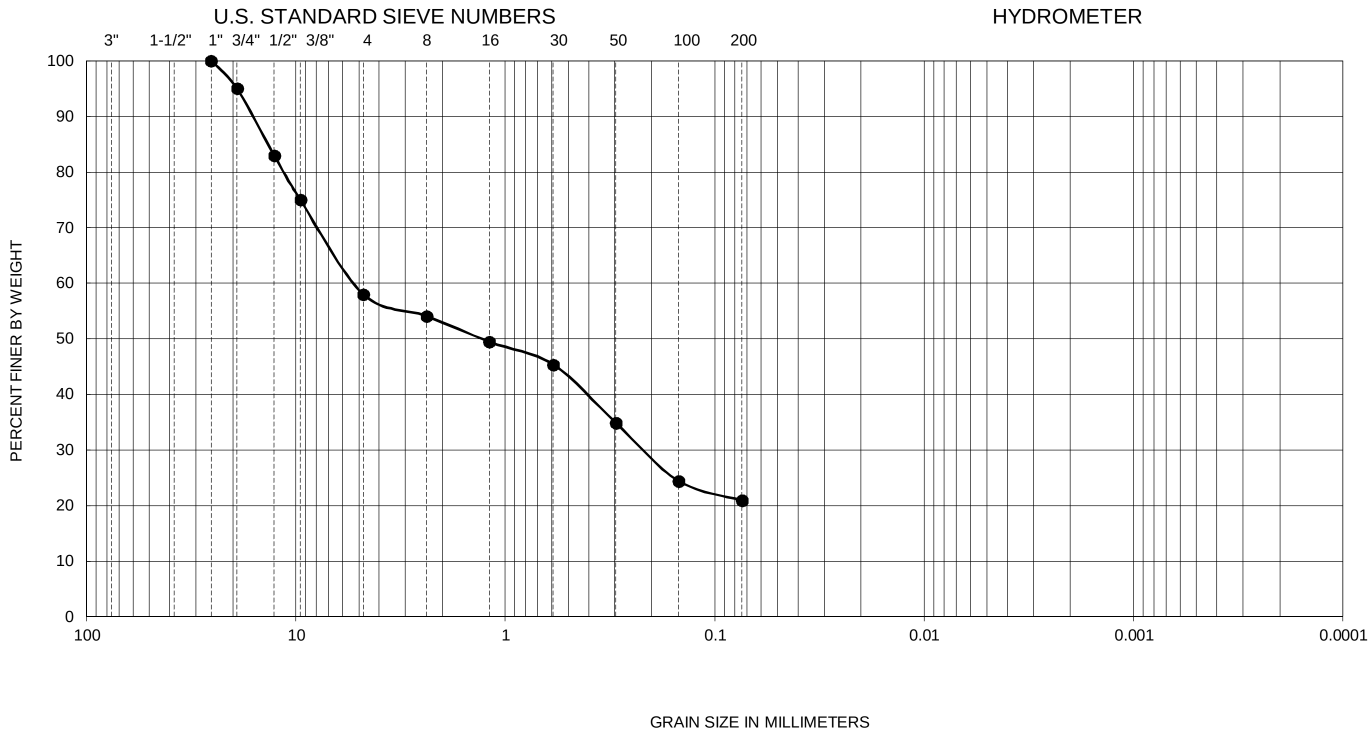
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	IT-2	1.0-5.0	--	--	--	--	--	--	--	--	31	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	IT-4	1.0-5.0	--	--	--	--	--	--	--	--	21	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

FIGURE B-3

GRADATION TEST RESULTS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

SAMPLE LOCATION	SAMPLE DEPTH (ft)	INITIAL MOISTURE (percent)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (percent)	VOLUMETRIC SWELL (in)	EXPANSION INDEX	POTENTIAL EXPANSION
B-1	0.5-2.5	7.6	120.2	14.3	0.002	2	Very Low
B-3	1.0-5.0	9.5	111.8	17.2	0.014	14	Very Low
B-4	0.0-4.0	10.5	106.6	17.9	0.009	9	Very Low

PERFORMED IN GENERAL ACCORDANCE WITH ☐ UBC STANDARD 18-2 ☑ ASTM D 4829

FIGURE B-4

EXPANSION INDEX TEST RESULTS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-4	0.0-4.0	8.6	880	110	0.011	400

[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-5

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

CORROSIVITY TEST RESULTS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

SAMPLE LOCATION	SAMPLE DEPTH (ft)	SOIL TYPE	R-VALUE
B-1	0.5-2.5	Sandy CLAY	13

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2844/CT 301

FIGURE B-6

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

R-VALUE TEST RESULTS

SAN DIEGO FIRE-RESCUE AIR OPERATIONS HANGARS
MONTGOMERY-GIBBS EXECUTIVE AIRPORT, SAN DIEGO, CALIFORNIA

108605001 | 9/18

APPENDIX C

Infiltration Test Data

Test Date:	8/17/2018						Infiltration Test No.:	IT-1
Test Hole Diameter, D (inches):			8.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.0
t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:00	2.90	7:25	2.90	25	0.00	---	2.10	<0.01
7:25	2.90	7:50	2.90	25	0.00	---	2.10	<0.01
7:50	2.90	8:20	2.90	30	0.00	---	2.10	<0.01
8:20	2.90	8:50	2.90	30	0.00	---	2.10	<0.01
8:50	2.90	9:20	2.91	30	0.01	250	2.10	0.02
9:20	2.90	9:50	2.90	30	0.00	---	2.10	<0.01
9:50	2.90	10:20	2.90	30	0.00	---	2.10	<0.01
10:20	2.90	10:50	2.90	30	0.00	---	2.10	<0.01
10:50	2.90	11:20	2.90	30	0.00	---	2.10	<0.01
11:20	2.90	11:50	2.90	30	0.00	---	2.10	<0.01
11:50	2.90	12:20	2.90	30	0.00	---	2.10	<0.01
12:20	2.90	12:50	2.90	30	0.00	---	2.10	<0.01

Test Date:	8/17/2018						Infiltration Test No.:	IT-2
Test Hole Diameter, D (inches):			8.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.0
t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:01	2.50	7:26	2.50	25	0.00	---	2.50	<0.01
7:26	2.50	7:51	2.50	25	0.00	---	2.50	<0.01
7:51	2.50	8:21	2.50	30	0.00	---	2.50	<0.01
8:21	2.50	8:51	2.50	30	0.00	---	2.50	<0.01
8:51	2.50	9:21	2.50	30	0.00	---	2.50	<0.01
9:21	2.50	9:51	2.51	30	0.01	250	2.50	0.02
9:51	2.50	10:21	2.50	30	0.00	---	2.50	<0.01
10:21	2.50	10:51	2.50	30	0.00	---	2.50	<0.01
10:51	2.50	11:21	2.50	30	0.00	---	2.50	<0.01
11:21	2.50	11:51	2.50	30	0.00	---	2.50	<0.01
11:51	2.50	12:21	2.50	30	0.00	---	2.50	<0.01
12:21	2.50	12:51	2.50	30	0.00	---	2.50	<0.01

Notes:

t_1 = initial time when filling or refilling is completed

d_1 = initial depth to water in hole at t_1

t_2 = final time when incremental water level reading is taken

d_2 = final depth to water in hole at t_2

Δt = change in time between initial and final water level readings

ΔH = change in depth to water or change in height of water column (i.e., d_2 - d_1)

H_0 = Initial height of water column

in/hr = inches per hour

Percolation Rate to Infiltration Rate Conversion [1]

$$I_t = \frac{\Delta H \times 60 \times r}{\Delta t\left(r + 2H_{avg}\right)}$$

I_t = tested infiltration rate, inches/hour

ΔH = change in head over the time interval, inches

Δt = time interval, minutes

r = effective radius of test hole

H_{avg} = average head over the time interval, inches

[1] Based on the "Porchet Method" as presented in:
Riverside County Flood Control, 2011, Design Handbook for Low Impact Development Best Management Practices: dated September.

Test Date:	8/17/2018						Infiltration Test No.:	IT-3
Test Hole Diameter, D (inches):			8.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.0
t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:04	2.85	7:29	2.85	25	0.00	---	2.15	<0.01
7:29	2.85	7:54	2.85	25	0.00	---	2.15	<0.01
7:54	2.85	8:24	2.85	30	0.00	---	2.15	<0.01
8:24	2.85	8:54	2.85	30	0.00	---	2.15	<0.01
8:54	2.85	9:24	2.85	30	0.00	---	2.15	<0.01
9:24	2.85	9:54	2.86	30	0.01	250	2.15	0.02
9:54	2.85	10:24	2.85	30	0.00	---	2.15	<0.01
10:24	2.85	10:54	2.85	30	0.00	---	2.15	<0.01
10:54	2.85	11:24	2.85	30	0.00	---	2.15	<0.01
11:24	2.85	11:54	2.85	30	0.00	---	2.15	<0.01
11:54	2.85	12:24	2.85	30	0.00	---	2.15	<0.01
12:24	2.85	12:54	2.85	30	0.00	---	2.15	<0.01

Test Date:	8/17/2018						Infiltration Test No.:	IT-4
Test Hole Diameter, D (inches):			8.0				Excavation Depth (feet):	5.0
Test performed and recorded by:			GSW				Pipe Length (feet):	5.0
t_1	d_1 (feet)	t_2	d_2 (feet)	Δt (min)	ΔH (feet)	Percolation Rate (min/in)	H_{avg} (feet)	Infiltration Rate (in/hr)
7:05	2.20	7:30	2.20	25	0.00	---	2.80	<0.01
7:30	2.20	7:55	2.20	25	0.00	---	2.80	<0.01
7:55	2.20	8:25	2.20	30	0.00	---	2.80	<0.01
8:25	2.20	8:55	2.20	30	0.00	---	2.80	<0.01
8:55	2.20	9:25	2.20	30	0.00	---	2.80	<0.01
9:25	2.20	9:55	2.20	30	0.00	---	2.80	<0.01
9:55	2.20	10:25	2.20	30	0.00	---	2.80	<0.01
10:25	2.20	10:55	2.20	30	0.00	---	2.80	<0.01
10:55	2.20	11:25	2.21	30	0.01	250	2.80	0.01
11:25	2.20	11:55	2.20	30	0.00	---	2.80	<0.01
11:55	2.20	12:25	2.20	30	0.00	---	2.80	<0.01
12:25	2.20	12:55	2.20	30	0.00	---	2.80	<0.01

Notes:

t_1 = initial time when filling or refilling is completed

d_1 = initial depth to water in hole at t_1

t_2 = final time when incremental water level reading is taken

d_2 = final depth to water in hole at t_2

Δt = change in time between initial and final water level readings

ΔH = change in depth to water or change in height of water column (i.e., d_2 - d_1)

H_0 = Initial height of water column

in/hr = inches per hour

Percolation Rate to Infiltration Rate Conversion [1]

$$I_t = \frac{\Delta H \times 60 \times r}{\Delta t\left(r + 2H_{avg}\right)}$$

I_t = tested infiltration rate, inches/hour

ΔH = change in head over the time interval, inches

Δt = time interval, minutes

r = effective radius of test hole

H_{avg} = average head over the time interval, inches

[1] Based on the "Porchet Method" as presented in:
Riverside County Flood Control, 2011, Design Handbook for Low Impact Development Best Management Practices: dated September.

Worksheet C.4-1: Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions[9]

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		Project Phase:
San Diego Fire-Rescue Air Operations Hangars		Design
Criteria 1: Infiltration Rate Screening		
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[11]? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☐ No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☑ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ☐ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).	
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☐ Yes; Continue to Step 1C. ☐ No; Skip to Step 1D.	
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ☐ No; full infiltration is not required. Answer "No" to Criteria 1 Result.	
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☐ Yes; continue to Step 1E. ☐ No; select an appropriate infiltration testing method.	

[9] Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.

[10] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

[11] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐ Yes; continue to Step 1F. ☐ No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐ Yes; continue to Step 1G. ☐ No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐ Yes; answer "Yes" to Criteria 1 Result. ☐ No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☑ No; full infiltration is not required. Skip to Part 1 Result.
Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report. In-situ infiltration testing of site soils indicated that the water level at all four test locations generally remained constant over the 30 minute testing intervals and did not infiltrate. For infiltration test method, locations, and results, refer to the project preliminary geotechnical evaluation report (2018) prepared by Ninyo & Moore.	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐ Yes	☐ No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐ Yes	☐ No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 1 Result – Full Infiltration Geotechnical Screening[12]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐ Full infiltration Condition ☑ Complete Part 2

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

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[10]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	Project Phase:
San Diego Fire-Rescue Air Operations Hangars	Design
Criteria 3 : Infiltration Rate Screening	
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☑ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☑ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☑ No: Skip to Part 2 Result.
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate). A total of four infiltration tests were conducted at the site. Each test was performed at a depth of approximately 5 feet in very old paralic deposits consisting of silty sandstone. In-situ infiltration rates were measured as follows: IT-1: did not infiltrate IT-2: did not infiltrate IT-3: did not infiltrate IT-4: did not infiltrate	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐ Yes	☐ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[10]	
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 2 – Partial Infiltration Geotechnical Screening Result[13]	Result
If answers to both Criteria 3 and Criteria 4 are “Yes”, a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is “No”, then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☑ No Infiltration Condition

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

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

5710 Ruffin Road | San Diego, California 92123 | p. 858.576.1000

ARIZONA | CALIFORNIA | COLORADO | NEVADA | TEXAS | UTAH

www.ninyoandmoore.com