City of SACRAMENTO
Community Development

300 Richards Boulevard, Third Floor
Sacramento, CA 95811

DATE: March 25, 2022

TO: Interested Persons

FROM: Scott Johnson, Senior Planner
Community Development Department

RE: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING FOR THE GROUNDWATER MASTER PLAN WELL REPLACEMENT PROGRAM

COMMENT PERIOD: March 25, 2022 through April 25, 2022

SCOPING MEETING: April 13, 2022

INTRODUCTION

Pursuant to section 21166 of the California Public Resources Code and section 15162 of the California Environmental Quality Act (CEQA) Guidelines, the City is the Lead Agency for preparation of a Program Environmental Impact Report (Program EIR) for the proposed City of Sacramento Groundwater Master Plan Well Replacement Program.

The Program EIR is being prepared in compliance with the California Environmental Quality Act. The City, as Lead Agency, is issuing this Notice of Preparation (NOP) to inform trustee and responsible agencies, as well as the public, of its decision to prepare a Program EIR for the City of Sacramento's Groundwater Master Plan Well Replacement Program. The purpose of the NOP is to provide information describing the projects and their potential environmental effects to those who may wish to comment regarding the scope and content of the information to be included in the Program EIR. Agencies should comment on such information as it relates to their statutory responsibilities in connection with the project.

SUBMITTING COMMENTS

Comments and suggestions as to the appropriate scope of analysis in the Program EIR are invited from all interested parties. Written comments or questions concerning the Program EIR for the proposed project should be directed to the environmental project manager at the following address by 5:00 p.m. on April 25, 2022. Please include the contact person's full name and address in order for staff to respond appropriately:

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SCOPING MEETING

A public scoping meeting will be held on April 13, 2022, from 12:00 p.m. to 1:00 p.m. via the following Zoom link: https://cityofsacramento-org.zoom.us/webinar/register/WN_dOhBh888R6ahFqBmp2XWqQ, or by phone at (669) 900-6833 (Webinar ID 942 7841 6721).

Responsible agencies and members of the public are invited to attend and provide input on the scope of the Program EIR. There will be a presentation by the City to introduce the proposed project, followed by an opportunity for public comment.

PROJECT LOCATION/SETTING

The proposed Project is the replacement of 38 groundwater wells throughout the City of Sacramento. The replacement well locations are at sites within residential, commercial, and industrial areas, schools, parks, and existing public facilities (such as existing City well sites, water storage facilities, and water treatment facilities). Figure 1 is an overview map of the well sites and Table 1 lists each proposed location. Appendix A of the CEQA Initial Study, provided at the City's website link provided on page 3 of this NOP, shows maps and well site layouts for each of the 38 well sites.

PROJECT PURPOSE

The purpose of the proposed Well Replacement Program is to replace City municipal wells that are at the end of their useful life. Due to climate change, extremely dry years are expected to be more frequent and intense, and maintaining the City's capability to extract groundwater more reliably will allow the City to diversify its water supply portfolio. In addition, the frequency of wildfires within the upstream watershed is causing surface water treatment challenges. Climate and regulatory changes may impact future availability of surface water, and reliable groundwater supply is needed to ensure long-term sustainability of both supplies. For these reasons, the City is also supporting and participating in regional conjunctive use programs that store and manage groundwater to improve long-term water supply reliability in the region.

PROJECT DESCRIPTION

The Well Replacement Program involves the long-term (up to 15 years or potentially longer) replacement of up to 38 municipal groundwater wells that are at or near the end of their useful life. The program is an outgrowth of the City's *Groundwater Master Plan* and identifies where, when, and how certain municipal production wells should be replaced, given current economic, regulatory and water quality constraints as well as variations in hydrologic and climate conditions affecting reliability of the City's surface water supply. Replacement wells are located within the City's water service area, which overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin. Replacement planning was found to be necessary because many of the current well locations are too small to accommodate same-site well replacement, and groundwater quality concerns may affect the ability to use many of the City's existing wells. As such, new locations are required for most replacement wells. An example of a proposed well site layout for construction is shown in Figure 2 and an example of an existing well site is shown in Figure 3.

The proposed Project includes the construction, operation and long-term maintenance of 38 wells, including above-ground wellhead facilities, such as pumps and a chlorination/ fluoridation system housed within a one-story concrete block wall structure, as well as below ground sanitary sewer and drinking water distribution system connections. Replacement wells would be constructed to produce approximately 1,250 gallons per minute of groundwater when in full operation. Wells in areas with groundwater quality concerns would require the construction and operation of necessary treatment systems. The Project also includes destruction of the 38 existing City wells and would take place after the replacement well is fully operational.

ENVIRONMENTAL EFFECTS AND SCOPE OF THE PROGRAM EIR

The Program EIR will focus on environmental resource topics that were found to be potentially significant in the CEQA Initial Study. The following resource topics will be analyzed in the Program EIR: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Transportation and Traffic, and Tribal Cultural Resources. The Program EIR will include a section on effects found not to be significant that will describe the resource topics that were identified by the CEQA Initial Study as having no impacts or less than significant impacts, which will not be further addressed in the Program EIR. These topics are Agricultural and Forestry Resources, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Utilities and Service Systems, and Wildfire. Potential cumulative impacts and potential for growth inducement will be evaluated as well as alternatives to the proposed Project including the No Project Alternative.

Environmental documents related to the project may be reviewed on the Utilities Department web site at: http://www.cityofsacramento.org/Utilities/Water/Current-Projects/Groundwater-Well-Replacement

And on the Community Development Department, Environmental Impact Report webpage at: https://www.cityofsacramento.org/Community-Development/Planning/Environmental/Impact-Reports

Table 1: Replacement Well Locations and Attributes

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 1	Well 112B	Residential; Mark Hopkins Elementary School	South American	1,250	350
Well 2	Well 138B	Residential; William G Chorley Park	South American	1,250	350
Well 3	Well 114B	Mixed use residential and commercial; Collis P Huntington Elementary School	South American	1,250	350
Well 4	Well 94B	Residential; North end of Tahoe Park near baseball diamonds	South American	1,250	350
Well 5	Well 146B	Residential; Glenn Hall Park near Glenn Hall Pool	South American	1,250	350
Well 6	Well 151B	Residential; Glenbrook Park	South American	1,250	350
Well 7	Well 155B	Commercial; Granite Regional Park	South American	1,250	397
Well 8	Well 127B	Residential; Camellia Park	South American	1,250	350
Well 9	Well 93B	Mixed use residential and commercial; Danny Nunn Park	South American	1,250	350
Well 10	Well 123B	Residential; Grant Union High School	North American	1,250	370
Well 11	Well 131B	Residential; Robla Reservoir	North American	1,250	500
Well 12	Well 120B	Commercial; near 43rd Avenue and 88th Street	South American	1,250	350
Well 13	Well 144B	Commercial; end of Asher Lane off of Elder Creek Road	South American	1,250	350

[1]Replacement well numbering is based on a prioritization of the top 10 wells needing replacement, followed by sequential number for the remaining wells. Also, note Well 18 does not exist due to a typo in the City's *Groundwater Master Plan* (2017).

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 14 [2]	Well 167	Mixed use residential & commercial; 2nd well at Shasta Reservoir	South American	1,250	1,200
Well 15	Well 92B	Residential; Fong Ranch Road near Discovery High School	North American	1,250	400
Well 16	Well 91B	Mixed use residential and commercial; 66th Street Fire Station	South American	1,250	350
Well 17	Well 111B	Residential; Johnston Park	North American	1,250	400
Well 19	Well 109B	Residential; Elkhorn Tank Site	North American	1,250	600
Well 20	Well 125B	Residential; El Centro Tank Site	North American	1,250	600
Well 21	Well 129B	Mixed use residential and commercial; near intersection of Rio Linda Blvd and Altos Ave	North American	1,250	300
Well 22	Well 124B	Mixed use residential and commercial; Robertson Park	North American	1,250	308
Well 23	Well 159B	Residential; Gardenland Park	North American	750	375
Well 24	Well 139B	Commercial; near intersection of Commerce Circle and Lathrop Way	North American	1,250	255
Well 25	Well 156B	Commercial; Fee Drive near Tribute Road	North American	1,250	380
Well 26	Well 134B	Residential; near intersection of Bell Ave and Baumgart Way	North American	1,250	513
Well 27	Well 126B	Residential; Hagginwood Park	North American	1,250	432

[2] The second well at the Shasta Reservoir site (Well 167) has been installed, but is not yet operational, and is thus being addressed in this document only for operational impacts.

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 28	Well 154B	Mixed use residential and commercia; near intersection of Dry Creek Road and Ascot Drive	North American	1,250	1,000
Well 29	Well 133B	Mixed use residential and commercial; Located behind 4590 Pell Drive	North American	1,250	514
Well 30	Well 143B	Mixed use residential and commercial; near intersection of Acacia Ave and Rio Linda Blvd	North American	1,250	330
Well 31	Well 122B	Mixed use residential and commercial; near intersection of Del Paso Blvd and Juliesse Ave	North American	1,250	422
Well 32	Well 137B	Residential; near intersection of Del Paso Blvd and Los Robles Blvd	North American	1,250	1,000
Well 33	Well 107B	Residential; Rio Cazadero High School	South American	1,250	350
Well 34	Well 158B	Commercial; Sacramento Fire Department Station 19	North American	1,250	318
Well 35	Well 110B	Commercial; 2nd well at Granite Regional Park	South American	1,250	350
Well 36	Well 141B	Mixed use residential and commercial; 2nd well at Danny Nunn Park	South American	1,250	350
Well 37	Well 157B	Commercial; 2nd well near 43rd Avenue and 88th Street	South American	1,250	350
Well 38	Well 142B	Commercial; 2nd well at E.A. Fairbairn Water Treatment Plant	South American	3,000	314
Well 39	Well 116B	Mixed use commercial and residential; Capitol Gateway Reservoir well	North American	1,250	400

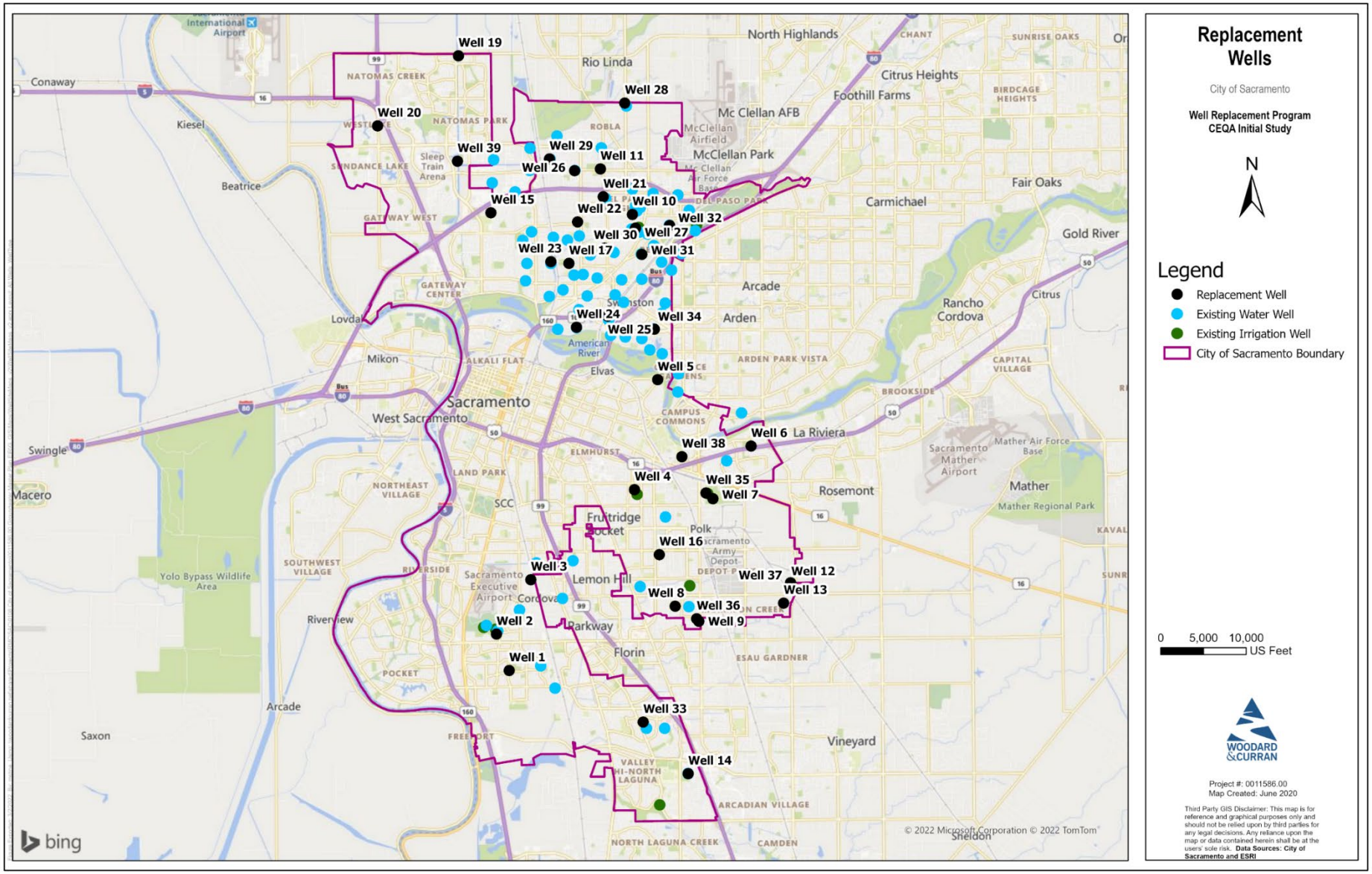

Figure 1: Replacement Well Locations

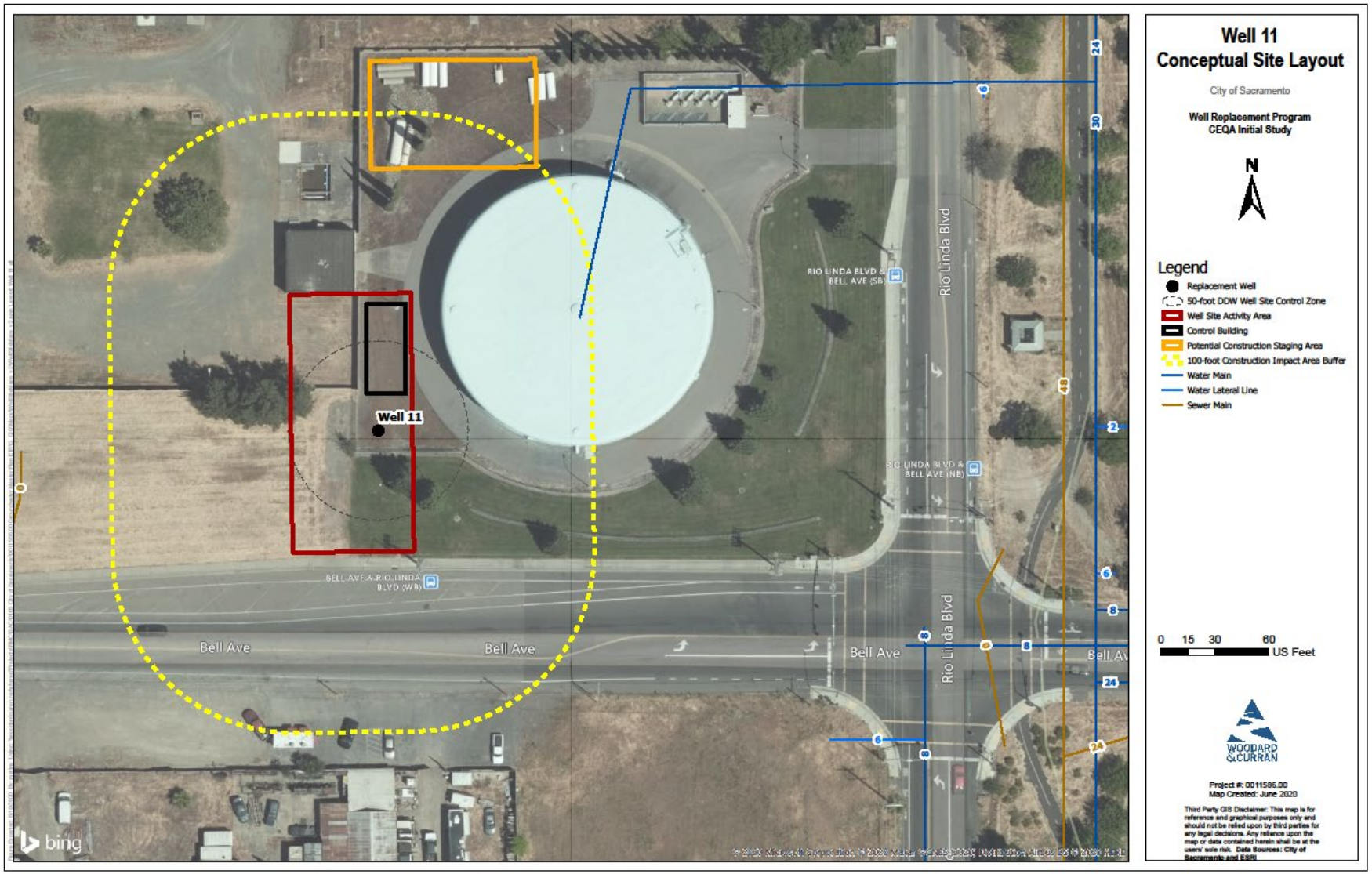

Figure 2: Example of Proposed Well Facility Layout for Construction

Figure 3: Example of an Existing Well Site

California Environmental Quality Act (CEQA) Initial Study

City of Sacramento Groundwater Master Plan Well Replacement Program

Prepared by:

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City of Sacramento
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Appendix A: Detailed Siting of New Facilities

Appendix B: CalEEMod Results

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Acronyms

Acronym	Definition
AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
Basin Plan	Central Valley Water Quality Control Plan
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS/NCIC	California Historical Information System/North Central Information Center
CMU	concrete masonry unit
CNPS	California Native Plant Society
Corps	US Army Corps of Engineers
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dB	decibel
dBA	a-weighted decibel
DDW	Division of Drinking Water, State Water Resources Control Board
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA or USEPA	U.S. Environmental Protection Agency
EMD	Sacramento County Environmental Management Department
FESA	Federal Endangered Species Act
GHG	greenhouse gas
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HMMP	Habitat Mitigation and Monitoring Plan
HSC	California Health and Safety Code

Acronym	Definition
IS	Initial Study
L_{EQ}	estimated equivalent sound level
L_{MAX}	estimated maximum noise level
MCL	Maximum Contaminant Level
MLD	Most Likely Descendant
MT	metric tons
NBHCP	Natomas Basin Habitat Conservation Plan
ND	Negative Declaration
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
OHWM	ordinary high water mark
PCE	perchloroethylene
PPV	peak particle velocity
PRC	Public Resources Code
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Council of Governments
SGMA	Sustainable Groundwater Management Act
SSC	Species of Special Concern
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
VMT	vehicle miles traveled
VOC	volatile organic compound
WEAP	Worker Environmental Awareness Program
WDR	Waste Discharge Requirement
WFA	2000 Water Forum Agreement

1. INTRODUCTION

1.1 Purpose of this Document

The City of Sacramento has prepared this Initial Study (IS) to evaluate the potential environmental impacts related to implementation of the Well Replacement Program (the "proposed Project," or "Project"), which consists of replacement of up to 38 existing wells with new wells.

The City of Sacramento is the lead agency under the California Environmental Quality Act (CEQA) for the proposed Project. CEQA requires that the lead agency prepare an IS to determine whether an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND) is needed. The City of Sacramento has prepared this IS to evaluate the potential environmental consequences associated with the Well Replacement Program, and to disclose to the public and decision makers the potential environmental effects of the proposed Project. Based on the analysis presented herein, an EIR appears to be the appropriate level of environmental documentation for the proposed Project.

1.2 Scope of this Document

This IS has been prepared in accordance with CEQA (as amended) (Public Resources Code Section 21000 et. seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000 et. seq.), as updated on December 28, 2018. CEQA Guidelines Section 15063 describes the requirements for an IS. Where appropriate, this document refers to either the CEQA Statute or State CEQA Guidelines (as amended in December 2018). This IS contains all of the contents required by the CEQA Guidelines, which includes a project description, a description of the environmental setting, potential environmental impacts, mitigation measures for any significant effects, consistency with plans and policies, and names of preparers.

This IS evaluates the potential for environmental impacts to resource areas identified in Appendix G of the State CEQA Guidelines (as amended in December 2018). The environmental resource areas analyzed in this document include:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire
- Mandatory Findings of Significance

2. PROJECT DESCRIPTION

2.1 Project Overview

The City of Sacramento Well Replacement Program involves the construction and operation of up to 38 groundwater extraction wells within the City's water service area, which overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin, as well as distribution system improvements and the destruction of up to 38 existing active and inactive municipal wells that are at or near the end of their useful life. Please refer to *Section 2.4* for a detailed description of the Project components.

2.2 Purpose and Need for Project

The following subsections describe the purpose and need for the City's Well Replacement Program project.

2.2.1 Background/Need for Project

The City of Sacramento's *Groundwater Master Plan*, completed in 2017, is a strategic guide for future planning that describes the role of groundwater in the City's water supply portfolio and presents a plan for managing groundwater resource use in the context of long-term water supply security and implementation of the Sustainable Groundwater Management Act (SGMA) of 2014. The *Groundwater Master Plan* provides recommendations for changes to existing groundwater operations, new groundwater-related infrastructure, and potential conjunctive use alternatives to allow the City to reliably meet its long-term water supply demands. Based on these recommendations, specific potential groundwater projects were identified and prioritized for the City's consideration. Included in the *Groundwater Master Plan* is a program to replace the City's existing wells that are found to be at or near the end of their useful life. Replacement planning was found to be necessary because many of the current well locations are too small to accommodate same-site well replacement, and groundwater quality concerns impact or threaten the ability to utilize many of the City's existing wells. As such, new locations are required for most replacement wells.

The *Groundwater Master Plan* evaluates maximum and minimum groundwater use scenarios based on future water demand projections and identifies the number of replacement wells that would be needed under each scenario. Some wells would be replaced on site, others nearby, and others further away (either within or outside of the groundwater basin of the existing well). For the purposes of this IS, the maximum groundwater use scenario is evaluated, which involves the replacement of up to 38 existing groundwater extraction wells (both City-owned existing active and inactive wells).

2.2.2 Purpose of Project

The proposed Well Replacement Program, which is an outgrowth of the City's *Groundwater Master Plan*, is intended to identify where, when, and how certain municipal production wells should be replaced, given current economic, regulatory and water quality constraints as well as variations in hydrologic and climate conditions affecting reliability of the City's surface water supply. The City's primary water source is surface water from the Sacramento and American Rivers, where rights to extract river water are derived through five different water rights permits. Beginning in 1957, the City entered into a water rights settlement contract with the U.S. Bureau of Reclamation that limits the maximum amount of water the City can divert off the two rivers. Per the settlement contract, the City is entitled to a maximum of 81,800 acre-feet from the Sacramento River per year, and an increasing maximum from the American River that ranges from 208,500 acre-feet in 2020 to 245,000 acre-feet in 2030 and beyond. The settlement also specifies maximum combined diversions from the two rivers.

The City is also a signatory of the 2000 Water Forum Agreement where local municipalities, leaders, and other interested parties in Sacramento, Placer, and El Dorado counties defined purveyor-specific limitations to groundwater pumping and surface water diversions as well as a regional understanding of management of dry year water supplies and water conservation, including establishing sustainable yield for the portion of the North American Subbasin within Sacramento County (locally referred to as the North Basin) and the South American Subbasin. The purpose of the Agreement is to achieve the two goals of ensuring water reliability through 2030 and preserving value of the Lower American River. Under the Agreement, the City agreed to limit its diversions from the American River to the E.A. Fairbairn Water Treatment Plant during extremely dry years and periods where river flows are below criteria set by Judge Richard Hodge in a 1990 decision based on the *Environmental Defense Fund v. East Bay Municipal Utilities District* litigation. The City can continue to divert American River entitlements at its Sacramento River facility during these limiting periods, subject to the capacity restrictions of that facility. The sustainable yield of the North Basin has been established as 131,000 acre-feet per year (AFY), based on pumping in 1995 (Sacramento Water Forum 2000). The sustainable yield of the South American Subbasin has been established as 273,000 AFY (Sacramento Water Forum 2000). There are currently no existing regulations that directly limit the use or expansion of groundwater pumping in the South American Subbasin. With the passing of SGMA in 2014, high and medium priority groundwater basins, as designated by the California Department of Water Resources (DWR), are required to submit Groundwater Sustainability Plans (GSPs) to DWR by January 31, 2022. The North American Subbasin and South American Subbasin are both designated as high priority groundwater basins and GSPs are currently in development. Once adopted, the projects and actions described in the GSPs will be implemented with the goal of sustainable groundwater basin management by 2042.

While the Sacramento and American Rivers will continue to play a key role in the City's water supply portfolio, the City has recognized that demographic, climatic, and regulatory changes have resulted in a need to solidify the capacity and strategic use of groundwater to improve water supply reliability, diversify the City's supply portfolio, and to promote conjunctive use of the City's water supplies. The City overlies two groundwater subbasins of the Sacramento Valley Groundwater Basin: the North American Subbasin, located north of the American River, and the South American Subbasin, located south of the American River. Currently, the City has 22 active municipal wells permitted by State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) in the North American Subbasin and two (2) active municipal wells in the South American Subbasin permitted by DDW. Additionally, the City has four (4) active municipal wells permitted by DDW that are currently offline in the North American Subbasin and three (3) municipal wells pending permitting by DDW in the South American Subbasin. The City's combined 2035 retail urban demand and wholesale demand is projected to be 206,800 acre-feet, as reported in the City's most recent Urban Water Management Plan (UWMP) (2016). As part of the *Groundwater Master Plan*, water demand projections (combined retail and wholesale) from the City's *2010 Water Supply Master Plan* (2013) and 2015 UWMP (2016) were evaluated to develop a composite future demand projection for the years 2030 to 2050. These demands were compared with surface water supplies available from the Sacramento and American rivers per water rights and related agreements. The analysis determined that the City has sufficient surface water entitlements to supply projected demands. **Table 2-1** shows the future composite demand projections compared with the maximum allowed surface water diversions under average annual conditions.

Table 2-1: Availability of Surface Water under Average Annual Conditions (Acre-Feet)

Year	Retail Demand	Wholesale Demand	Total Demand	Sacramento River Maximum Diversion	American River Maximum Diversion	Total Surface Water Available	Unused Surface Water
2020	122,229	40,588	162,817	81,800	208,500	290,300	127,483
2025	129,548	47,717	177,265	81,800	228,000	309,800	132,535
2030	138,882	58,586	197,468	81,800	245,000	326,800	129,332
2035	148,213	58,586	206,799	81,800	245,000	326,800	120,001
2040	161,029	58,586	219,615	81,800	245,000	326,800	107,185
2045	174,841	58,586	233,427	81,800	245,000	326,800	93,373
2050	180,900	59,155	240,055	81,800	245,000	326,800	86,745

The City has historically relied on groundwater to meet 15 to 20 percent of its water supply demands, making groundwater an important component of the City's water supply portfolio. Overall, the City has sufficient surface water resources to meet projected demands, yet presently is limited by surface water treatment capacity. Maintaining the City's capability to extract groundwater more reliably, particularly during extremely dry years, anticipated to be more frequent and intense due to climate change, will allow the City to diversify its water supply portfolio as climate and regulatory changes may impact future availability of surface water supplies and to effectively manage their various water supplies in a conjunctive manner to ensure long-term sustainability of both supplies.

Groundwater quality concerns at existing well locations have also impacted the City's ability to utilize groundwater. Currently, five of the City's municipal wells (Wells 92, 111, 127, 144 and 154) are offline due to water quality concerns. Wells 92 and 111 are not permitted by the SWRCB DDW. While Well 92 currently meets all DDW drinking water requirements, the well has tested positive for coliform bacteria after conducting airlift development and disinfection to remove the presence of bacteria in 2016. Water produced from Well 111 has had elevated concentrations of iron, manganese, and turbidity periodically over their respective Maximum Contaminant Levels (MCLs). Well 111 is also close to the El Monte perchloroethylene (PCE) contamination plume though PCE has not been detected in the raw groundwater from the well. Iron has been reported above the DDW MCL in Well 127 in 1993 and 1995, coupled with elevated turbidity levels; however, Well 127 has met DDW drinking water standards for all other regulated constituents. Groundwater produced from Well 144 meets all DDW drinking water requirements. The City has removed this well from service due to the recent presence of PCE in March 2016, though the PCE concentration measured was below the DDW MCL of 5 µg/L. In Well 154, hexavalent chromium is very close to the revoked MCL of 10 µg/L (California Water Boards, 2018).

2.3 Environmental Setting

The Project area is generally built-out. Surrounding land uses for existing and proposed replacement wells include single-family residential, multi-family residential, schools, commercial, office, public facilities (such as existing well sites, water storage facilities, and water treatment facilities), and open space/park. Of the City's 38 existing active and inactive municipal production wells identified for replacement, 35 wells are located in the North American Subbasin and three (3) are located in the South American Subbasin. Of the proposed 38 replacement groundwater extraction wells, 20 wells are located in the North American Subbasin and 18 are located in the South American Subbasin.

2.4 Existing Facilities

Table 2-2 describes the 38 existing active and inactive municipal production wells operated by the City that are to be replaced in addition to five (5) wells that are not considered for replacement due to substantial remaining useful life (25 or more years of remaining useful life). The locations of the 43 existing municipal production wells are shown in **Figure 2-1**. In 2015, the City pumped and delivered 13,479 acre-feet of groundwater for retail use, plus an additional 227 acre-feet (AF) of groundwater for wholesale (City of Sacramento, 2016). For comparison purposes, the City diverted, treated, and delivered 70,467 AF of surface water from the Sacramento and American Rivers during the same time period. As of 2020, the City's oldest active well is 80 years old, and the average age of the City's wells is 57 years. All but five of the City's wells are currently at or near the end of their useful life and will need to be replaced within the next 5 to 15 years.

Table 2-2: Existing Municipal Production Well Inventory

Well Number	Location Description	Subbasin	Operational Status	Remaining Useful Life (Years, as of 2020)	Well Depth (feet)
Well 83	Residential area; Parking lot at 6550 Wyndham Dr	South American	Active	7	240
Well 91	Residential; Near corner of W El Camino Ave and Northview Dr	North American	Active	4	350
Well 92	Residential; Northview Dr between Bridgeford Dr and Los Lunas Way	North American	Inactive	4	435
Well 93	Residential; Near corner of Tenaya Ave and Northview Dr	North American	Active	4	328
Well 94	Mixed residential and commercial; Parking lot behind 3307 Northgate Blvd	North American	Active	4	351
Well 107	Residential; Near corner of Maybelline Way and Grandstaff Dr	South American	Active	2	201
Well 109	Mixed use commercial and residential; Empty lot at corner of Colfax St and Stanford Ave	North American	Inactive	7	390
Well 110	Mixed residential and commercial; Southgate Rd between Edgewater Road and Canterbury Rd	North American	Inactive	7	390
Well 111	Mixed residential and commercial; Calvados Ave Arden Way Alley between Oxford and Forrest St	North American	Inactive	0	303
Well 112	Mixed use residential and commercial; Parking lot at 2240 Evergreen St	North American	Active	2	360
Well 114	Commercial; Parking lot at 1200 Arden Way	North American	Active	4	366

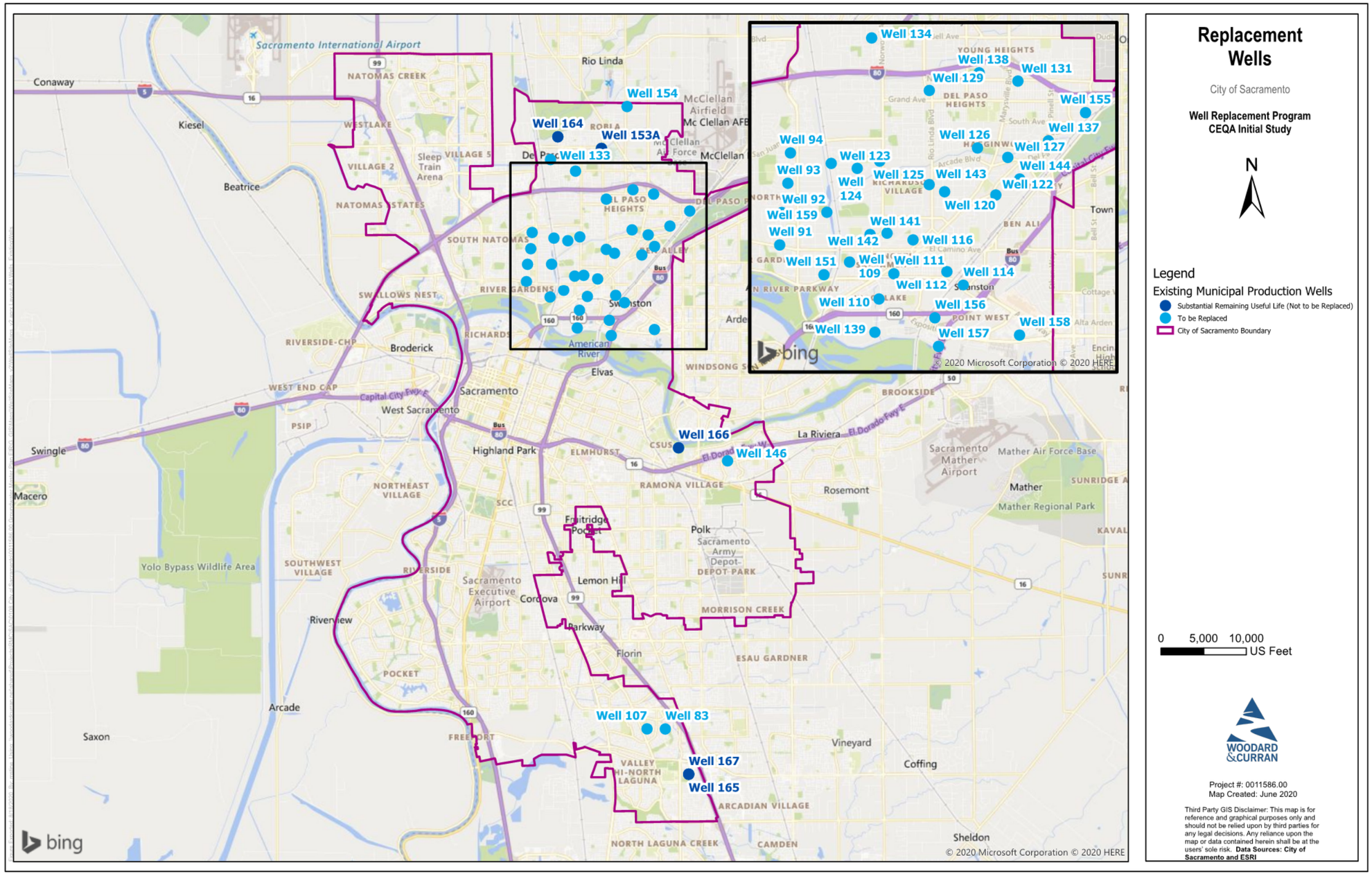
Well Number	Location Description	Subbasin	Operational Status	Remaining Useful Life (Years, as of 2020)	Well Depth (feet)
Well 116	Mixed use residential and commercial; Parking lot at corner of Plaza Ave and Oakmont St	North American	Inactive	4	340
Well 120	Residential area; Branch Rd between Alamos Ave and Acacia Ave	North American	Active	4	440
Well 122	Mixed use residential and commercial; Adjacent to empty lot near corner of Juliesse Ave and Del Paso Blvd	North American	Active	4	422
Well 123	Residential; Dead end of Fairbanks Ave and Western Ave	North American	Active	4	306
Well 124	Residential; Near corner of Danville Way and Cookingham Way	North American	Active	9	308
Well 125	Residential; Parking lot behind 321 Fairbanks Ave	North American	Inactive	7	300
Well 126	Residential; Near intersection of Rivera Dr and High Street behind Hagginwood Park	North American	Active	4	432
Well 127	Residential area; Lot behind 1665 Arcade Blvd	North American	Inactive	9	401
Well 129	Mixed use residential and commercial; Near corner of Harris Ave and Rio Linda Blvd	North American	Active	0	300
Well 131	Residential; Near corner of North Ave and Ivy Street	North American	Active	4	280
Well 133	Mixed use residential and commercial; Behind parking lot at 4596 Pell Dr	North American	Active	4	514
Well 134	Residential; Bell Ave between Norwood Ave and Austin St	North American	Active	0	513
Well 137	Residential area; Empty lot at corner of Los Robles Blvd and Del Paso Blvd	North American	Active	9	245
Well 138	Residential; Fell St between Stephanie Ave and Rene Ave	North American	Active	4	375
Well 139	Commercial area; Parking lot at 1770 Lathrop Way	North American	Active	12	255

Well Number	Location Description	Subbasin	Operational Status	Remaining Useful Life (Years, as of 2020)	Well Depth (feet)
Well 141	Residential area; Empty lot on Grove St north of the Norwood Bypass and south of Lampasas Ave	North American	Inactive	7	315
Well 142	Residential; Behind residence at Norwood Ave and Norwood Bypass	North American	Inactive	0	384
Well 143	Mixed use residential and commercial; Empty lot on Acacia Ave between Altos Ave and Rio Linda Blvd	North American	Active	14	330
Well 144	Mixed use residential and commercial; Eldridge Ave between Judah St and Academy Way	North American	Inactive	7	396
Well 146	Residential; Jefferson School Park	South American	Inactive	7	307
Well 151	Residential; Empty lot at dead end of Jefferson Ave	North American	Inactive	7	346
Well 153A	Mixed use residential and commercial; Main Ave between Rio Linda Blvd and Taylor Street	North American	Active	25	628
Well 154	Residential; Dry Creek Rd between Ascot Ave and Neal Rd	North American	Inactive	0	414
Well 155	Mixed use residential and commercial; Corner of Roanoke Ave and Cameron Rd	North American	Active	4	427
Well 156	Commercial; Near Highway 160 on ramp at Tribute Rd	North American	Active	4	380
Well 157	Commercial area; Tribute Rd adjacent to westbound Business 80 near American River Bike Trail	North American	Inactive	7	377
Well 158	Commercial; Parking lot of Sacramento Fire Department Station 19	North American	Active	9	318
Well 159	Residential; Dead end of Bowman Rd near bike trail	North American	Active	0	375
Well 164	Mixed use residential and commercial; Parking lot at 5091 Kelton Way	North American	Active	30	635
Well 165 (Shasta 1)	Residential; Shasta Reservoir	South American	Permit Pending	80	1203

Well Number	Location Description	Subbasin	Operational Status	Remaining Useful Life (Years, as of 2020)	Well Depth (feet)
Well 166 (E.A. Fairbairn)	Commercial; E.A. Fairbairn Water Treatment Plant	South American	Permit Pending	80	314
Well 167 (Shasta 2) [1]	Residential; Shasta Reservoir	South American	Permit Pending	80	?

[1] This well is the same as replacement Well 14 identified in Table 2-3. This well was completed after the City's *Groundwater Master Plan* (2017) was finalized.

Figure 2-1: Existing Municipal Production Wells



Replacement Wells

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

Existing Municipal Production Wells
- Substantial Remaining Useful Life (Not to be Replaced)
- To be Replaced
- City of Sacramento Boundary

0 5,000 10,000
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Existing well facilities are largely located on City-owned parcels such as parks or secured or undeveloped lots. Groundwater quality is generally good throughout most of the North American and South American Subbasins within the City's service area. Within both Subbasins, elevated arsenic and hexavalent chromium levels are present in some areas (predominantly on the west side) in addition to PCE above the Primary MCL. Iron and manganese are also present in some locations at concentrations over the Secondary MCL. Several contaminant plumes are known throughout the Subbasins and are related to past land uses such as McClellan Airforce Base and Sacramento Railyard in the North American Subbasin and Mather Airforce Base and Aerojet in the South American Subbasin. In addition, other potential point sources include leaking underground storage tanks, improperly stored pesticides, and leaking dry cleaning solvents. However, water quality at existing production wells operated by the City is generally good and wells largely only require disinfection, including blending, chlorination, as well as fluoridation.

2.5 Proposed Project

As previously stated, the City's Well Replacement Program includes the replacement (destruction of existing and construction of new wells) of up to 38 municipal wells within the City's service area, as well as distribution system improvements to accommodate new well locations. Of the 38 proposed replacement groundwater extraction well sites, 20 sites are located within the North American Subbasin and 18 sites are located within the South American Subbasin. **Table 2-3** describes the attributes of the 38 proposed replacement wells and **Figure 2-2** shows the locations of the 38 replacement wells relative to the existing municipal production wells. All wells except two would produce approximately 1,250 gallons per minute (gpm) of groundwater. The two exceptions are Well 23 and Well 38. These replacement wells would produce the same capacity as existing wells with Well 23 constructed in the North American Subbasin and capable of producing approximately 750 gpm, and Well 38 constructed in the South American Subbasin and capable of producing approximately 3,000 gpm. Detailed siting of well facilities for all 38 proposed groundwater extraction well sites can be found in Appendix A. The useful life for each replacement well would be between 30 and 50 years, depending on construction materials, water quality, maintenance, and other related parameters.

Table 2-3. Replacement Well Attributes

Well Number [2]	Alternative Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 1	Well 112B	Residential; Mark Hopkins Elementary School	South American	1,250	350
Well 2	Well 138B	Residential; William G Chorley Park	South American	1,250	350
Well 3	Well 114B	Mixed use residential and commercial; Collis P Huntington Elementary School	South American	1,250	350
Well 4	Well 94B	Residential; North end of Tahoe Park near baseball diamonds	South American	1,250	350
Well 5	Well 146B	Residential; Glenn Hall Park near Glenn Hall Pool	South American	1,250	350
Well 6	Well 151B	Residential; Glenbrook Park	South American	1,250	350

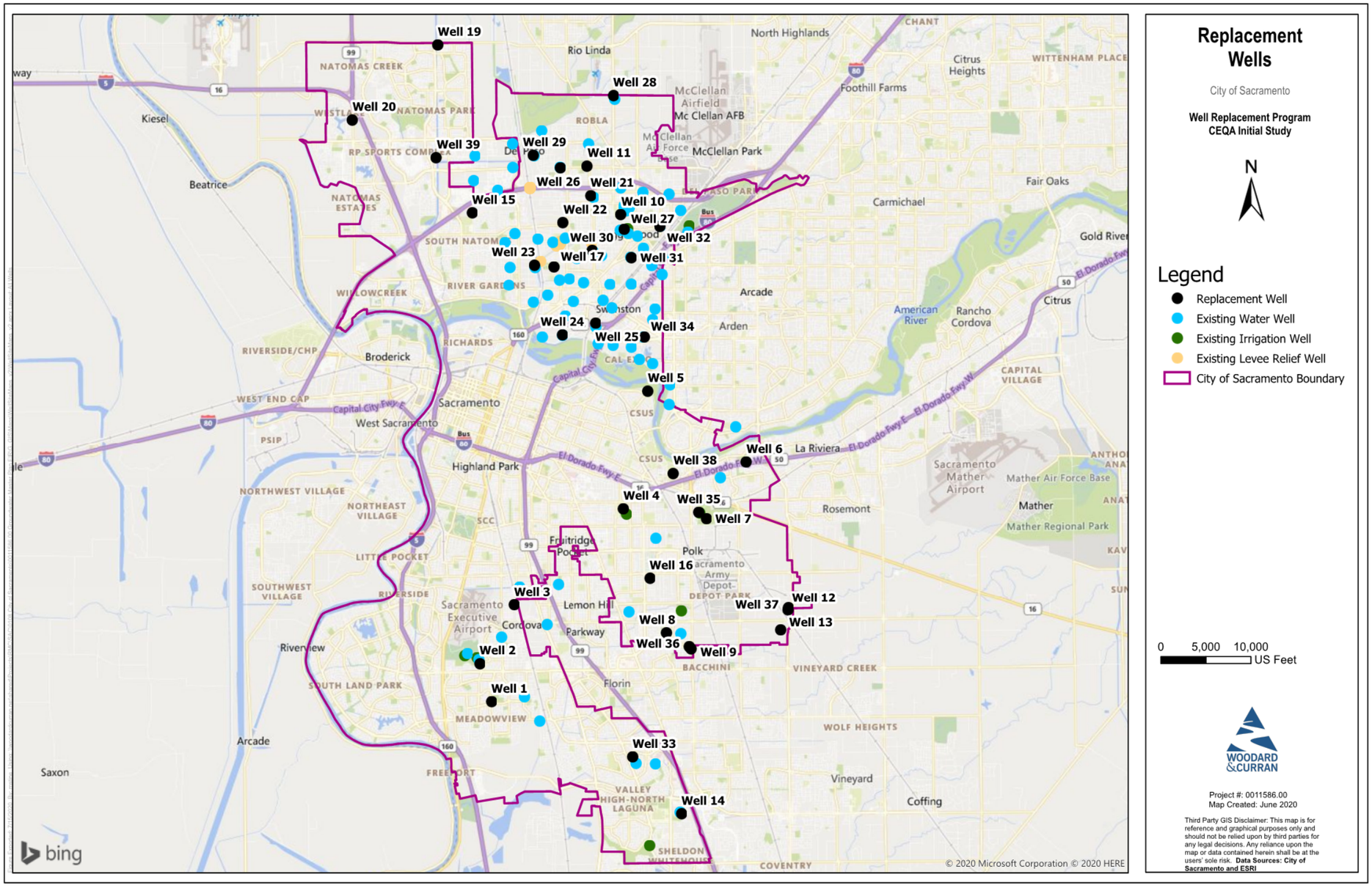
[2] Well 18 does not exist due to a typo in the City's *Groundwater Master Plan* (2017).

Well Number [2]	Alternative Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 7	Well 155B	Commercial; Granite Regional Park	South American	1,250	397
Well 8	Well 127B	Residential; Camellia Park	South American	1,250	350
Well 9	Well 93B	Mixed use residential and commercial; Danny Nunn Park	South American	1,250	350
Well 10	Well 123B	Residential; Grant Union High School	North American	1,250	370
Well 11	Well 131B	Residential; Robla Reservoir	North American	1,250	500
Well 12	Well 120B	Commercial; near 43rd Avenue and 88th Street	South American	1,250	350
Well 13	Well 144B	Commercial; end of Asher Lane off of Elder Creek Road	South American	1,250	350
Well 14 [3]	Well 167	Mixed use residential and commercial; 2nd well at Shasta Reservoir	South American	1,250	1,200
Well 15	Well 92B	Residential; Fong Ranch Road near Discovery High School	North American	1,250	400
Well 16	Well 91B	Mixed use residential and commercial; 66th Street Fire Station	South American	1,250	350
Well 17	Well 111B	Residential; Johnston Park	North American	1,250	400
Well 19	Well 109B	Residential; Elkhorn Tank Site	North American	1,250	600
Well 20	Well 125B	Residential; El Centro Tank Site	North American	1,250	600
Well 21	Well 129B	Mixed use residential and commercial; near intersection of Rio Linda Blvd and Altos Ave	North American	1,250	300
Well 22	Well 124B	Mixed use residential and commercial; Robertson Park	North American	1,250	308
Well 23	Well 159B	Residential; Gardenland Park	North American	750	375
Well 24	Well 139B	Commercial; near intersection of Commerce Circle and Lathrop Way	North American	1,250	255
Well 25	Well 156B	Commercial; Fee Drive near Tribute Road	North American	1,250	380
Well 26	Well 134B	Residential; near intersection of Bell Ave and Baumgart Way	North American	1,250	513
Well 27	Well 126B	Residential; Hagginwood Park	North American	1,250	432

[3] The second well at the Shasta Reservoir site (Well 167) has been installed, but is not yet operational, and is thus being addressed in this document only for operational impacts.

Well Number [2]	Alternative Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 28	Well 154B	Mixed use residential and commercia; near intersection of Dry Creek Road and Ascot Drive	North American	1,250	1,000
Well 29	Well 133B	Mixed use residential and commercial; Located behind 4590 Pell Drive	North American	1,250	514
Well 30	Well 143B	Mixed use residential and commercial; near intersection of Acacia Ave and Rio Linda Blvd	North American	1,250	330
Well 31	Well 122B	Mixed use residential and commercial; near intersection of Del Paso Blvd and Juliesse Ave	North American	1,250	422
Well 32	Well 137B	Residential; near intersection of Del Paso Blvd and Los Robles Blvd	North American	1,250	1,000
Well 33	Well 107B	Residential; Rio Cazadero High School	South American	1,250	350
Well 34	Well 158B	Commercial; Sacramento Fire Department Station 19	North American	1,250	318
Well 35	Well 110B	Commercial; 2nd well at Granite Regional Park	South American	1,250	350
Well 36	Well 141B	Mixed use residential and commercial; 2nd well at Danny Nunn Park	South American	1,250	350
Well 37	Well 157B	Commercial; 2nd well near 43rd Avenue and 88th Street	South American	1,250	350
Well 38	Well 142B	Commercial; 2nd well at E.A. Fairbairn Water Treatment Plant	South American	3,000	314
Well 39	Well 116B	Mixed use commercial and residential; Capitol Gateway Reservoir well	North American	1,250	400

Figure 2-2. Replacement Well Locations



2.5.1 Project Siting Criteria

The 38 replacement well sites were chosen using the following prioritizing criteria:

1. Existing wells were replaced on site, when possible
2. Replacement wells were sited at locations adjacent to existing well sites, when possible
3. Replacement wells were sited in the same groundwater basin but at a different location, when possible
4. When the above criteria could not be met, the replacement well locations were determined based on preferred sites and sites large enough to contain two wells without significant pumping interference
5. All replacement wells were to be located and constructed to avoid the need for treatment for manganese, iron, arsenic, methane, hydrogen sulfide, and other constituents, and only require disinfection (chlorination) and fluoridation

In selecting the specific well facility locations, the following minimum criteria were applied, though sites that exceeded minimum requirements and best accommodated well facilities were identified to the extent possible:

- Located close to existing roads and buildings to allow for easier site access by vehicles performing construction and maintenance, utility access, and minimal disturbance of existing park open space and facilities.
- Adequate space for a control building and/or fenced enclosure to secure wellhead facilities.
- Adequate space to allow for chlorination and fluoridation systems consisting of, at a minimum, a pressure tank and backwash tank.
- No wellhead treatment for constituents. Only disinfection is anticipated to be required,(chlorination) and fluoridation. In the event that treatment for manganese, iron, arsenic, methane, hydrogen sulfide or other constituents, is required, such treatment equipment would be sited outside of the control building within the current wellhead footprint and concealed in visually sensitive areas using concrete masonry unit (CMU) block wall, security and/or ornamental fencing, and landscaping, as appropriate.
- New municipal well sites require a 50-foot well site control zone from any sewer, including sanitary, industrial, or storm sewer, main or lateral (per California Well Standards); locations could be adjusted in final design to maintain adequate setback from these or other facilities such as recycled water lines.
- New municipal wells sited near surface water bodies will be located and screened to avoid production of groundwater under direct influence on surface water.
- Well sites to be coordinated with developers of master planned communities, if applicable, to set aside dedicated parcels that are in favorable hydrogeologic locations (acceptable water quality and capacity) for groundwater wells, as well as within proximity (less than 200 feet)

from required infrastructure (i.e. electrical power, water distribution mains, storm drain, and sewer mains).

- New municipal well sites are recommended to be approximately one acre in size (approximately 200 feet by 200 feet) to accommodate possible future water quality treatment, emergency generators, and replacement wells.
- The minimum lot size for a new well site must be 120 feet by 120 feet.
- The layout of above-grade pumping equipment (piping and valving) needs to allow sufficient access for future maintenance and rehabilitation of the well.
- Where a well site is within a City park, a larger control building would be required to securely contain the well, above-grade piping, chemical and electrical rooms, and associated appurtenances.
- Control building housing the well and pump would need adequate access for well maintenance and rehabilitation, including access (i.e. detachable skylight or roof or integrated crane) to remove pumping equipment for maintenance.
- Conceptual well site layout should include sufficient open area for chemical delivery, siting of the production well, control building, site access, emergency generator, future water quality treatment, and replacement well.
- Aerial footprint of the well site and construction staging site and pathway clear of elevated power supplies/lines for crane operations.
- Safe ingress and egress from the well site for regular well maintenance vehicles and large crane trucks for periodic well maintenance, located along streets or access roads with low speed limits and good sightlines.
- Approximate construction staging area of 90 feet by 60 feet adjacent to the well site with room to park a minimum of two large vehicles (three-quarter ton).

2.5.2 Construction Activities and Schedule

Construction of wells under the Project would take place in four stages: exploratory drilling, well drilling and construction, well equipping, and well destruction.

Exploratory Drilling

Prior to well construction, new well sites would be evaluated by a State of California Certified Hydrogeologist with an exploratory drilling program to characterize the site- and depth-specific geologic and water quality considerations prior to designing a new municipal production well. The exploratory drilling program would provide data necessary to support the design for each municipal well. Where depth-specific water quality is already known and acceptable, such as where replacing a decommissioned well on the same parcel or in close proximity (less than 500 feet), the exploratory drilling program would only include a test hole. At locations identified for new wells where the previous data are not available (i.e. no existing wells) and groundwater quality is unknown, an exploratory drilling program would include depth-specific monitoring well(s) to access the major aquifers underlying the site.

For sites where depth-specific water quality is already known and acceptable, construction of a test hole would be conducted over the course of one (1) week per site. For sites where previous data are not available and water quality is unknown, depth-specific monitoring wells would be constructed and tested over the course of one (1) month per site with monitoring activities conducted periodically over the course of nine (9) to 12 months.

Well Drilling

Well drilling and design would be completed in accordance with California Well Standards Bulletin 74-81 and Bulletin 74-90 as well as Sacramento County requirements. Well drilling is assumed to require two (2) to five (5) weeks of continuous drilling operation (depending on well depth), where drilling operations for 24 hours/day are needed to prevent borehole collapse. The well drilling phase schedule depends on the depth of the well and whether groundwater quality in the area of the well site is known. Where groundwater quality is known, all construction activities would take place over the course of six (6) to eight (8) months per well, including exploratory drilling, well drilling and construction, and well equipping. Where groundwater quality is not known, all construction activity (including exploratory drilling, well drilling and construction, and well equipping) would be spread out over the course of nine (9) to 12 months per well to allow for additional aquifer testing. It is assumed that the City would replace the 38 wells over a period of 15 years.

Well Equipping

Well equipping includes the construction of all above-grade facilities as well below grade pipelines to connect the replacement well to the potable water distribution system. The following facilities with associated appurtenances will be installed as part of the well equipping phase:

Above-Grade Facilities

- Control building with chemical and electrical rooms, including HVAC and ventilation, with the following facilities contained within the control building:
    - Chlorine equipment and feed lines
    - Fluoride equipment and feed lines
    - Well pad (except at vacant lots and existing utility facilities where wellhead will be located outside of the control building)
    - Well pump with discharge pipe and motor and sound attenuation devices, as necessary (except at vacant lots and existing utility facilities where wellhead will be located outside of the control building)
    - Pressure filter, as necessary
    - Backwash tank, as necessary
    - Flow meter (except at vacant lots and existing utility facilities where wellhead will be located outside of the control building)
    - Electrical appurtenances including service entrance switchboard, motor control cabinet (MCC), and variable frequency drive (VFD/SS), conduit, wire, lighting, receptacles, and grounding; instrumentation

  - Supervisory control and data acquisition (SCADA) communications antenna, up to 50 feet above ground surface
  - Automated meter reading telemetry antenna, up to 50 feet above ground surface
- Additional treatment systems for manganese, iron, arsenic, methane, hydrogen sulfide, and other constituents, as necessary
- Standby generator (as needed)
- Bollards, where appropriate
- Signal pole
- Security fencing, where appropriate
- Site camera monitoring systems, where appropriate
- Concrete masonry unit (CMU) block wall with razor wire or high security ornamental topping, where appropriate
- Ornamental fencing with automatic rolling gate and pedestrian gate, where appropriate
- Concrete paving
- Landscaping, irrigation, and cover material for restoration of existing landscape to preconstruction conditions or to screen treatment systems in visually sensitive areas. Landscaping will consist of drought tolerant and native vegetation and include drip irrigation, where appropriate, to promote water efficiency.

Below-Grade Facilities

Drain system piping

- Sanitary inlets

Air gap structure

- Electrical service
- Polyvinyl chloride (PVC) pipe

The well site layout and required security features would vary based on the surrounding land use of the well location. For wells located at schools and parks, the control building (with associated appurtenances) with a detachable roof would house the well pump to secure the pump and reduce noise as the well is operating while providing appropriate access for maintenance (**Figure 2-3)**. Well sites located on vacant property would include CMU block walls to reduce visual interest and divert noise from the site vertically, in addition to ornamental fencing and security fencing around the control building and well pump (**Figure 2-4**). For wells located at existing utility facilities, such as above-ground reservoirs, the control building and well pump would be installed within existing fenced or walled areas with bollards installed around the pump and controls to prevent potential damage by on-site utility vehicles.

In the event treatment systems for constituent removal are required, additional equipment would need to be sited outside of the control building (**Figure 2-5**, circled in red) within the current well footprint, and in some locations would require additional security with CMU block walls such as high security topping, and landscaping in visually sensitive areas. The permanent footprint for large treatment systems could be in the range of 30 feet by 60 feet (or potentially larger or smaller), with the actual footprint varying depending on the type of treatment required, treatment technology, and flow rates at individual well sites. Some of the proposed well replacement sites, including well sites 16, 23, 25, 27 and 36, may have site constraints that would need to be considered in planning and constructing a larger treatment system at the site. These constraints include available space (e.g. narrow lot or small lot with limited access), surrounding trees that limit access, visual impacts to surrounding properties, and impingement on existing site uses (e.g. park or public school). Additionally, larger treatment systems at proposed well sites located within public parks or schools would need to consider visual impacts and public perception issues. Therefore, in the future, when well treatment requirements are known, additional analyses and design considerations would be needed when siting larger treatment systems at some sites.

Figure 2-3. Conceptual Well Site Layout at School or Park

Figure 2-4. Conceptual Well Site Layout at Vacant Property

Figure 2-5. Conceptual Well Site Layout with Treatment for Constituents

Potable water distribution system improvements could include either 12-inch diameter ductile pipeline or 18-inch diameter ductile, welded steel, or reinforced concrete pipeline per City standards. Sewer system improvements would include PVC pipelines potentially ranging in diameter from 2- to 4-inches to allow discharge of raw groundwater prior to bringing the well online or out of standby mode. Uniform excavation, backfilling, and installation requirements are assumed for all required pipeline connections and improvements. A flow control valve would also be required on all lines to prevent backflow. Construction of pipeline that would be required to connect the replacement wells to the City's water distribution and sewer systems would occur within the existing right-of-way along public roads with proper notice and traffic mitigation measures in place prior to and during construction.

The width of pipeline construction zones generally would be 20 feet. In general, the pipeline trench would be excavated to a depth of up to six feet and would be approximately 10 feet wide. After trenching, the pipeline would be placed in the trench. The trench would then be backfilled with native soil excavated from the trench, to the extent feasible and appropriate, and then compacted to meet applicable compaction requirements. However, depending on the soil conditions of the excavated materials, imported backfill could be necessary for compatibility and stability. Once the trenches are backfilled, disturbed areas would be graded to restore to approximate pre-construction conditions and repaved or revegetated with native plant seed mix or turf as appropriate for the site. During installation, open trenches within roadways would

be covered at the end of each workday with steel plates or trench backfilling to accommodate vehicle access during non-work hours. Temporary lane or road closures may be required during construction along some of the pipeline routes.

On-site chlorine systems (chlorine gas, liquid sodium hypochlorite[4], or on-site generation of sodium hypochlorite from sodium salts) and fluoride systems (hydrofluorosilicic acid [liquid fluoride] or powdered/granular fluoride) would be used at each well site to minimize the use and delivery of hazardous materials to once per month. All chemicals would be stored within the control building at each well site. Proper control and mitigation measures would be put in place during chemical deliveries following all local, state, and federal procedures to ensure surrounding communities are not exposed. Proposed well sites were selected to ensure sufficient open space to avoid impacts to the surrounding community.

Construction of well equipping facilities would begin approximately six (6) weeks after the beginning of well drilling. Additional site clearing and grubbing beyond that conducted for well drilling may be required. Site excavation and grading would be minor, with excavation extending to a maximum depth of five feet for the control building foundation and utilities underneath the building. After the foundation and utilities connections are constructed, the remainder of the building would be constructed, and the well pump and other equipment installed. Following the completion of all construction activities, unpaved areas disturbed due to equipment staging or use will be restored to pre-construction conditions.

The well equipping phase consists of developing the site for the well, as described above, and is included in the six (6) to eight (8) month schedule for sites where groundwater quality is known and nine (9) to 12 month schedule where groundwater quality is unknown, as described above.

Well Destruction

The process for well destruction depends on the size and depth of the well as well as casing materials. Generally, for shallower and/or small diameter wells, the well would be over-drilled and the borehole would be backfilled with grout or another annular sealing material approved by the Sacramento County Environmental Management Department (EMD). Larger or deeper wells would require perforating the casing (often with a subsurface explosion containing bb's) and then pressure-grouting the well/borehole and capping above-grade with cement. The sealing material would completely fill the boring.

For the well destruction stage, the City would destroy approximately 23 wells over the next five years (through 2025), an additional 13 wells by 2030, and an additional two (2) wells by 2035 (based on the estimated remaining useful life of the existing wells identified to be replaced, though the schedule could be longer if any individual wells perform adequately longer than currently expected). All wells would be destroyed in accordance with California Well Standards (DWR Bulletin 74-81 and 74-90) and Sacramento County requirements. Well destruction would include the removal of all above-ground facilities at the well site, with the exception of fencing, and underground piping would be abandoned in place. Exceptions include locations where replacement wells are sited at the existing well facility, in which case only the existing well would be destroyed and all other facilities would be reused. Destruction of up to 38 existing active and inactive groundwater extraction wells nearing the end of their useful life is not tied to the construction of proposed replacement wells, except where replacement wells are located at the same site.

[4] Sodium hypochlorite is the active ingredient in household bleach. Typical household bleach contains 5.25 % sodium hypochlorite, while "extra strength" bleach may contain 6% to 7% sodium hypochlorite. Liquid sodium hypochlorite for water treatment facilities typically contains about 12% sodium hypochlorite.

2.5.3 Equipment / Staging

The anticipated construction equipment for construction of each well is shown in **Table 2-4**.

Table 2-4: Construction Equipment for Wells

Equipment	Number Required for Each Well
Backhoe/Loader	1
Excavator	1
Compactor	1
Drilling Rig with up to 3 support vehicles	1
Crane	1
Utility Truck	1
Water Truck	1
Welder	1
Compressor	1
Pump	1
Pick-up Trucks	2
Concrete Pumper	1
Cement Mixer	1
Asphalt Truck	1
Generator	1

In addition to the well site footprint, a nearby staging area of approximately 60 feet by 90 feet has been identified for all required equipment to minimize disturbance to existing facilities during construction. Existing paved areas, such as parking lots or basketball courts, have been identified at proposed replacement well locations for use in staging and materials lay-down. Where paved areas for staging are not available, staging would occur within the 100-foot radius of the wellhead location and the site restored following construction.

2.5.4 Operation and Maintenance

Annual operation and maintenance for the 38 replacement wells would require consumption of power and regular maintenance activities. Power requirements vary by well according to the pumping capacity and number of operating days per month, which varies according to water year type. During planned operation days, wells are assumed to pump for 24 hours. **Table 2-3** includes the pumping capacity for each of the 38 replacement wells. Well pumps to be installed at all replacement wells would be 90 indicated horsepower (IHP), with the exception of Well 38 which would include a 222 IHP pump and Well 23 which would include a 56 IHP pump.

Regular well maintenance for each well would include delivery of fluoride (liquid or powdered/granular) and of chlorine gas, sodium chloride salts (for on-site generation of sodium hypochlorite), or liquid sodium hypochlorite and well crew visits (one to two trips to each well per week), machinist visits (one weekly visit to each well), and electrical and instrumentation and site/landscape maintenance crew weekly visits to each well. Water quality sampling by City well maintenance staff will occur on a quarterly basis for the first year of well operation and triennially after the first year. Machinist and electrical/instrumentation crew visits would likely occur monthly when wells are new, with increasing frequency through time). Intermittent well maintenance activities may include pump testing and maintenance, well capacity testing, video surveying, or rehabilitation of the well during the life of the well.

It is possible that groundwater treatment for the removal of constituents such as manganese, iron, arsenic, methane, hydrogen sulfide, or other constituents may be necessary prior to introducing the supply to the distribution system. Treatment methodologies will vary depending on the type of constituent but could include filtration, aeration, carbon absorption, ion exchange, or oxidation. The footprint of treatment system, chemicals used, and maintenance requirements will also vary depending on the treatment method used, but will include, at a minimum, regular site visits by maintenance personnel to monitor system operations (likely monthly visits), replace treatment media, and/or deliver chemicals for use in groundwater treatment. The maintenance requirements for treatment systems will be site-specific and will vary depending on the constituent to be removed, constituent concentration, treatment system size and production rates.

2.6 Environmental Commitments

The following measures are written best management practices (BMPs) that would be implemented by the City as part of the project:

- Block wall (CMU) buildings would be designed and constructed around well facilities located on vacant lots for noise control and for security.
- Permanent LED exterior security lighting would be shielded downward to avoid light spill onto surrounding properties.
- The design and construction of the facilities would be based on known groundwater quality conditions, soils reports, and geotechnical investigations to minimize requirements for wellhead treatment.
- Replacement well sites would be restored (e.g. sites would be repaved or resodded) or left in a natural state as appropriate for California following well construction.
- Groundwater encountered during construction would be discharged to land or the storm drain in accordance with applicable permits or discharged to the City's sewer for treatment and reuse.
- All construction work would require the contractor to implement fire hazard reduction measures, such as having fire extinguishers located onsite, use of spark arrestors on equipment and using a spotter during welding activities.
- Construction would comply with Sacramento Metropolitan Air Quality Management District Rule 403 Fugitive Dust Control requirements.
- Specifications would require the contractor to prepare a Stormwater Pollution Prevention Plan (SWPPP). In accordance with the SWPPP, construction would implement BMPs to control water quality of stormwater discharges offsite, including measures, such as site management "housekeeping," erosion control, sediment control, tracking control and wind erosion control.

2.7 Right-of-Way Issues / Permits Required

Anticipated permits are identified in **Table 2-5**. Sacramento Metropolitan Air Quality Management District permits for new stationary sources may also be required if emergency generators are installed at the well sites.

Sacramento City Code 13.04.670 exempts the City from having to obtain a permit from Sacramento County, Environmental Management Department in order to drill or destroy a well so long as the well or pump is owned or operated by or on behalf of the City for municipal purposes.

Table 2-5: Permits and Approvals

Agency	Permit/Approval
City of Sacramento	Encroachment Permit, Building Permit
Sacramento Metropolitan Air Quality Management District	Permit to Construct, Permit to Operate for emergency generators
Sacramento County Environmental Management Department	Hazardous Materials Business Permit for storage of chemicals at well sites California Accidental Release Prevention Program registration (if required for storage of treatment chemicals at well sites)
Sacramento County Flood Control Agency	Encroachment Permit
California Division of Drinking Water of State Water Resources Control Board	Amended Water Supply Permit
State Water Resources Control Board	NPDES Construction General Permit for Storm Water Discharges associated with Construction Activities
Central Valley Regional Water Quality Control Board	NPDES/WDR permit for test water discharges during construction (or coverage under General Permit)
California Department of Toxic Substances Control	USEPA ID for any hazardous waste hauled from well sites
United States Environmental Protection Agency	Risk Management Program registration for regulated substances exceeding reportable quantity threshold (20 Code of Federal Regulations Part 68 [68.130])

3. ENVIRONMENTAL CHECKLIST FORM

1. **Project title:** Well Replacement Program

2. **Lead agency name and address:** City of Sacramento, Department of Utilities
1395 35th Ave
Sacramento, CA 95822
(916) 808-5454

3. **Contact person and phone number:** Kathy Sananikone
ksananikone@cityofsacramento.org
(916) 808-4011

4. **Project location:** City of Sacramento, Sacramento County, California

5. **Project sponsor's name and address:** Same as Lead Agency

6. **General plan designations:** Employment Center Low Rise, Industrial, Parks and Recreation, Public/Quasi-Public, Suburban Neighborhood High Density, Suburban Neighborhood Low Density, Suburban Neighborhood Medium Density, Traditional Neighborhood Low Density, Traditional Neighborhood Medium Density, Urban Center High, Urban Center Low

7. **Zoning:** Agricultural, Agricultural – Open Space, Employment Center, Industrial, Heavy Industrial, Manufacturing – Transportation, Multi-Family Residential, Standard Single Family Residential

8. **Description of project:** The City of Sacramento Well Replacement Project consists of the development and operation of up to 38 proposed groundwater extraction wells throughout the City's water service area, which overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin, as well as distribution system improvements. The Project includes the construction and operation of extraction wells, including wells and wellhead facilities, in addition to sanitary sewer connections and drinking water distribution system connections. Up to 20 groundwater extraction wells would be constructed in the North American Subbasin and up to 18 groundwater extraction wells would be constructed in the South American Subbasin. All wells except two would be constructed to produce approximately 1,250 gpm of groundwater. The two exceptions are Well 23 and Well 38. These replacement wells would be constructed to produce the same capacity as existing wells with Well 23 constructed in the North American Subbasin and capable of producing approximately 750 gpm, and Well 38 constructed in the South American Subbasin and capable of producing approximately 3,000 gpm. The Project also includes the destruction of 38 existing municipal production wells owned by the City that are at or near the end of their useful life.

9. **Surrounding land uses and setting:** The Project sites, both existing and replacement municipal production wells are located throughout the City of Sacramento. The Project area is generally built-out. Surrounding land uses for existing and proposed replacement wells include single-family residential,

multi-family residential, schools, commercial, office, public facilities (such as existing well sites, water storage facilities, and water treatment facilities), and open space/park. Of the City's 38 existing active and inactive municipal production wells identified for replacement, 35 wells are located in the North American Subbasin and three (3) are located in the South American Subbasin. Of the proposed 38 replacement groundwater extraction wells, 20 wells are located in the North American Subbasin and 18 are located in the South American Subbasin.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement

- City of Sacramento: Encroachment Permit, Building Permit
- Sacramento Metropolitan Air Quality Management District: Permit to Construct, Permit to Operate
- Sacramento County Environmental Management Department: Hazardous Materials Business Permit, California Accidental Release Prevention Program registration
- Sacramento County Flood Control Agency: Encroachment Permit
- California Division of Drinking Water: Amended Water Supply Permit
- State Water Resources Control Board: NPDES General Permit for Stormwater Discharges associated with Construction Activities
- Central Valley Regional Water Quality Control Board: NPDES/WDR permit for test water discharges during construction (or coverage under Construction General Permit)

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 2180.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

The City has consulted with Native American tribal representatives through written correspondence, based on a list of Native American groups provided by the Native American Heritage Commission. Additionally, City staff will provide notification and invitation to consult to the culturally affiliated tribes which have provided written request to receive such notification. Consultation would include discussion of the Project and potential effects to tribal cultural resources.

Impact Terminology

The level of significance for each resource area uses CEQA terminology as specified below:

No Impact. No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable.

Less than Significant Impact. Potential adverse environmental consequences have been identified. However, they are not adverse enough to meet the significance threshold criteria for that resource. No mitigation measures are required.

Less than Significant with Mitigation Incorporated. Adverse environmental consequences that have the potential to be significant but can be reduced to less than significant levels through the application of identified mitigation strategies that have not already been incorporated into the proposed project.

Potentially Significant. Adverse environmental consequences that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared to meet the requirements of CEQA.

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" requiring implementation of mitigation to reduce the impact to “Less Than Significant with Mitigation Incorporated” as indicated by the checklist on the following pages.

[X]	Aesthetics	[ ]	Agriculture and Forestry Resources	[X]	Air Quality
[X]	Biological Resources	[X]	Cultural Resources	[ ]	Energy
[X]	Geology/Soils	[X]	Greenhouse Gas Emissions	[X]	Hazards and Hazardous Materials
[X]	Hydrology/Water Quality	[ ]	Land Use/Planning	[ ]	Mineral Resources
[X]	Noise	[ ]	Population/Housing	[ ]	Public Services
[ ]	Recreation	[X]	Transportation	[X]	Tribal Cultural Resources
[ ]	Utilities/Service Systems	[ ]	Wildfire	[X]	Mandatory Findings of Significance

DETERMINATION*: (To be completed by Lead Agency)*

On the basis of this initial evaluation:

[ ] I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

[ ] I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

[X] I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

[ ] I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

[ ] I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

_____ _____

Signature Date

_____ _____

Printed Name For

3.1 Aesthetics

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Except as provided in Public Resources Code Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?	[ ]	[ ]	[X]	[ ]
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	[ ]	[ ]	[ ]	[X]
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	[ ]	[X]	[ ]	[ ]
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	[ ]	[X]	[ ]	[ ]

Discussion

The Sacramento and American Rivers are the primary natural scenic resources in the City of Sacramento (City of Sacramento, General Plan EIR, 2015). The City General Plan has policies to protect views from public places to the Sacramento and American Rivers and adjacent greenways, landmarks and the State Capitol along Capitol Mall. There are no designated scenic highways in the City of Sacramento. The closest scenic highway the portion of State Route 160 (River Road) from the Isleton Bridge to the Paintersville Bridge (Caltrans, 2019). The portion of State Route 160 within the City is not considered to be a scenic highway.

a) Less than Significant

Project facilities would not be visible from the Sacramento and American Rivers or adjacent greenways and are not located within sight of any landmarks, including the State Capitol. Impacts to scenic vistas would thus be less than significant.

b) No Impact

There are no scenic highways in the project area, so there would be no impact to scenic resources within a state scenic highway.

c) Less than Significant with Mitigation Incorporated

All project facilities would be located within an urbanized area and would comply with applicable City zoning requirements. For wells located at schools and parks, the pump would be housed in a building. Wells on vacant property would be enclosed by block walls to screen the equipment, and fencing would surround the control building and pump. Wells located at existing utility facilities would be consistent with the visual character of those facilities. **Figure 2-3** and **Figure 2-4** show examples of well buildings and well enclosures (well facilities at utility sites not pictured). **Figure 2-5** shows an example of a well requiring treatment for constituents and the additional treatment equipment that may be required, which would be located outside of the control building but within the current well footprint. **Mitigation Measure AES-1** would be implemented to ensure that the visual character of new facilities is consistent with the character of the surrounding area.

d) Less than Significant with Mitigation Incorporated

As noted in the Environmental Commitments section of the Project Description, permanent LED exterior security lighting would be shielded downward to avoid light spill onto surrounding properties, operational impacts would thus be less than significant. Because well-drilling activities would need to occur continuously, requiring nighttime construction, there would be a need for construction lighting, which could disrupt nearby properties. **Mitigation Measure AES-2** would be implemented to ensure that construction lighting would not result in adverse impacts associated with light and glare. Thus, impacts would be less than significant with mitigation.

Mitigation Measures:

To mitigate possible visual impacts of the Project, the City shall implement **Mitigation Measure AES-1** and **Mitigation Measure AES-2**. With these mitigation measures incorporated, the Project impacts would be less than significant

> **AES-1: Design of Aboveground Structures.** To minimize visual impacts on public views, permanent, aboveground structures (control buildings, well facilities and any treatment systems) shall be designed to blend into the existing visual character of their surroundings to the extent possible, including building and wall height, color, exterior architectural treatments, and landscaping.
>
> **AES-2: Low Illumination Nighttime Construction Lighting.** All nighttime construction lighting shall be of the lowest illumination necessary for Project construction, attached to motion sensors, and shielded and directed downward to avoid light spillage onto neighboring properties.

3.2 Agriculture and Forestry Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	[ ]	[ ]	[X]	[ ]
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	[ ]	[ ]	[ ]	[X]
c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	[ ]	[ ]	[ ]	[X]
d) Result in the loss of forest land or conversion of forest land to non-forest use?	[ ]	[ ]	[ ]	[X]
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	[ ]	[ ]	[X]	[ ]

Discussion

a) Less Than Significant Impact

The Project area is designated primarily as Urban and Built-Up and Other Land by the California Department of Conservation (CDOC) Farmland Mapping and Monitoring Program (FMMP) (CDOC 2018). None of the potential Project well sites are classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. One (1) well site (Well 15) is located on a parcel designated as Farmland of Local Importance (CDOC 2018), which is a classification given to land that is important to the local agricultural economy as determined by each county. Unlike the Prime Farmland, Unique Farmland, and Farmland of

Statewide Importance designations, Farmland of Local Importance has not been identified under the FMMP as having physical or chemical features (e.g., soil quality, growing season, and moisture supply) necessary for production of the State's leading agricultural crops. In Sacramento County, Farmland of Local Importance includes lands which do not qualify for designation as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland but are currently irrigated crops or pasture or non-irrigated crops; lands that would be Prime or Statewide designation and have been improved for irrigation but are now idle; and lands which currently support confined livestock, poultry operations, and aquaculture (CDOC 2017). Well 15 is not currently used for agriculture and land cover at the site consists of non-irrigated natural grasses (idle). The proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; therefore, the impact would be less than significant.

b) No Impact

There are no existing zoning restrictions that conflict with the proposed Project. Municipal wells to serve the City of Sacramento are allowed throughout the entire City regardless of zoning designation. There are no lands protected by a Williamson Act contract within the City of Sacramento (City of Sacramento 2015). Therefore, no impact would occur as a result of this project.

c) No Impact

There is no land zoned for forest land or timberland within the City of Sacramento (City of Sacramento 2019); therefore, the proposed Project would have no impact.

d) No Impact

There is no designated forest land or timberland within the City of Sacramento (City of Sacramento 2019). The Project sites are located primarily within residential, commercial, or mixed use residential and commercial areas, including parks, schools, and vacant lots with either no landscaping or landscaped with grass and trees. There are no forestry or timberland resources at any of the Project sites. Therefore, the proposed Project would have no impact related to the loss of forest land or timberland.

e) Less Than Significant Impact

The proposed groundwater extraction would be conducted in a manner consistent with North American Subbasin Groundwater Sustainability Plan (GSP or Plan) and South American Subbasin GSP, which are currently under development with a required submittal date to DWR of January 2022. The GSPs are being prepared pursuant to the Sustainable Groundwater Management Act (SGMA), which requires that groundwater extraction achieve sustainable levels by 2042, within 20 years of Plan adoption. This would ensure sustainable use of groundwater supplies and would not impede the ability of farmers to pump groundwater for irrigation use if needed. The Project would not induce other changes in the environment that would result in conversion of agricultural land to non-agricultural use. There is no designated forest land within the City of Sacramento; therefore, the project would not cause changes that would result in conversion of forest land to non-forest use. The proposed Project would have a less-than-significant impact.

Mitigation Measures: None required or recommended.

3.3 Air Quality

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	[ ]	[ ]	[X]	[ ]
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment under an applicable federal or state ambient air quality standard?	[ ]	[X]	[ ]	[ ]
c) Expose sensitive receptors to substantial pollutant concentrations?	[ ]	[X]	[ ]	[ ]
d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people?	[ ]	[ ]	[X]	[ ]

Discussion

The proposed Project is located within the County of Sacramento, which is under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD), for purposes of regional air quality planning, monitoring, and stationary source and facility permitting. The SMAQMD is responsible for developing air quality plans to meet and maintain compliance with federal and state air quality standards. The plans are developed based on collaboration with other regional planning efforts and agencies, including Sacramento Council of Governments (SACOG), other air districts in the Sacramento region, and county and city transportation and planning departments.

a) Less than Significant Impact

The applicable air quality plans include the federal attainment plans for ozone (O_3) and particulate matter-2.5 microns ($PM_{2.5}$), and the state attainment plan for O_3 and particulate matter-10microns (PM_{10}). The applicable plan for attaining the federal O_3 standards is the *Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan, 2013 SIP Revisions* (SMAQMD 2013a), which was approved by the U.S. EPA in 2015. This plan was developed with participation from the California Air Resources Board (CARB), SACOG, and the Bay Area Metropolitan Transportation Commission (MTC), as well as the five local air districts in the Sacramento region. SACOG contributions included development of updated motor vehicle emissions inventory, transportation control measures, and recent long-range transportation plans.

The *$PM_{2.5}$ Implementation/Maintenance Plan and Resignation Request for Sacramento $PM_{2.5}$ Nonattainment Area* (SMAQMD 2013b) addresses the 24-hour federal $PM_{2.5}$ standard. The Sacramento

$PM_{2.5}$ Planning Region, which includes all of Sacramento County and portions of neighboring Yolo, El Dorado, and Placer Counties, attained the standard based on 2009-2011 monitoring data, but SMAQMD postponed the submittal of the plan because of high concentrations in 2012 that caused exceedances. As of May 2017, U.S. EPA found that the region attained the 24-hour federal $PM_{2.5}$ standard. SMAQMD will update the *$PM_{2.5}$ Implementation/Maintenance Plan and Resignation Request for Sacramento $PM_{2.5}$ Nonattainment Area* in the future based on the clean data finding made by the U.S. EPA.

The nonattainment status for state O_3 and PM_{10} standards is addressed in the *Air Quality Attainment Plan (AQAP)*. The first *AQAP* was prepared in 1991, and SMAQMD has updated it every three years, in accordance with requirements of the California Clean Air Act. The most current update is the *2015 Triennial Report and Air Quality Plan Revision* (SMAQMD 2015).

The proposed Project would replace Sacramento's potable water wells to serve planned growth. It would not lead to unplanned growth that would conflict with local planning documents, upon which the applicable air quality plans are based. Impacts thus would be less than significant.

b) Less than Significant with Mitigation Incorporated

Criteria pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead. Ambient air quality standards have been set for these criteria pollutants at the federal level by the US Environmental Protection Agency (US EPA) and at the state level by CARB. Sacramento County is designated non-attainment status for the following ambient air quality standards: 1-hour state ozone standard; 8-hour federal and state ozone standards; 24-hour federal particulate matter $PM_{2.5}$ standard; 24-hour and annual state particulate matter PM_{10} standards. A non-attainment status means that measured pollutant concentrations have exceeded the ambient air quality standards. In the case of ozone, Sacramento County is designated "severe" non-attainment for the federal 8-hour ozone standard and "serious" non-attainment for the state 1-hour ozone standard.

SMAQMD has established significance thresholds to assist Lead Agencies in determining whether a project may have a significant air quality impact (**Table 3-1**). Projects whose emissions are expected to meet or exceed the recommended significance criteria would have a potentially significant adverse impact on air quality. SMAQMD has established mass emissions thresholds for ozone precursors (NO_X, and ROG/VOC) and for particulate matter (PM_{10} and $PM_{2.5}$) because Sacramento County does not meet state and federal ambient air quality standards for these criteria pollutants. Emissions of ozone precursors NO_X and ROG/VOC and particulate matter PM_{10} and $PM_{2.5}$ from individual projects would not have a cumulatively considerable contribution to ozone pollution if emissions do not exceed the mass emissions threshold levels.

The SMAQMD mass emissions thresholds for ozone precursors, NO_X, and ROG/VOC, and for particulate matter, PM_{10} and $PM_{2.5}$, are designed to attain the federal and state ambient air quality standards. The standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Therefore, if a project is consistent with the latest adopted clean air plan and does not exceed the SMAQMD significance thresholds, it can be assumed that it will not have a substantial adverse impact on public health.

Table 3-1: SMAQMD Criteria Pollutant Mass Emissions Thresholds

	Construction Phase	Operational Phase
NO_X (lbs/day)	85	65
ROG (VOC) (lbs/day)	NONE	65
PM_{10} (lbs/day)	80*	80*
PM_{10} (tons/year)	14.6*	14.6*
$PM_{2.5}$ (lbs/day)	82*	82*
$PM_{2.5}$ (tons/year)	15*	15*
If all feasible BACT/BMPs are applied (see **Mitigation Measures AIR-1, AIR-2, AIR-3).*		

Emissions of criteria pollutants from the proposed project were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2. Project-specific construction information regarding equipment, phase duration, and material import/export is consistent with the Project Description. Project-specific operational information regarding energy use and O&M activities is also consistent with the Project Description. CalEEMod default values were relied upon for other details not available in the Project Description that were necessary to estimate criteria pollutant emissions, such as trip lengths and soil moisture content. Modeling assumptions and results can be found in **Appendix B**.

For construction activities, criteria pollutants were estimated for a single well. It was assumed that construction activities would occur first, followed by demolition activities, for each well. Analysis of construction emissions was done to determine the extent of overlap of construction or demolition of other wells that could occur without violation of air quality significance thresholds. SMAQMD would require the City to implement the best available control technology and best management practices described in **Mitigation Measures AIR-1, AIR-2,** and **AIR-3**. The results of the emissions analysis, including incorporation of these **Mitigation Measures**, are presented in **Table 3-2**.

Table 3-2: Criteria Pollutant Emissions from Construction - Each Well

Phase	NO_X (lbs/ day)	ROG (VOC) (lbs/ day)	PM_{10} (lbs/ day)	PM_{10} (tons/ year)	$PM_{2.5}$ (lbs/ day)	$PM_{2.5}$ (tons/ year)
Site Preparation	18.2	1.6	3.3	<1	2.1	<1
Mobilization	3.9	0.4	0.3	<1	0.2	<1
Test Well Drilling	34.4	3.9	1.4	<1	1.2	<1
Test Well Testing	8.5	1.1	0.5	<1	0.4	<1
Production Well Drilling/ Construction	36.6	4.2	1.5	<1	1.4	<1
Production Well Development/ Testing	8.5	1.1	0.5	<1	0.4	<1
Demobilization	6.3	0.7	0.4	<1	0.3	<1
Well Equipping Construction	15.0	2.1	0.9	<1	0.8	<1
Well Destruction/ Demolition	16.5	1.8	1.2	<1	0.9	<1
Site Paving/ Landscaping	7.8	0.8	0.5	<1	0.4	<1
Max Daily Emissions	**36.6**	**4.2**	**3.3**	**<1**	**2.1**	**<1**
Threshold	*85*	*none*	*80*	*14.6*	*82*	*15*
Significant?	No	No	No	No	No	No

As shown in **Table 3-2**, the limiting parameter for emissions is NO_X with the highest emissions occurring during test well drilling (34.4 lbs/day) and production well drilling (36.6 lbs/day). Thus, a maximum of two wells can be in either a test well drilling phase or production well drilling phase at one time. **Mitigation Measure AIR-4** requires phasing of well drilling to ensure that emissions do not exceed thresholds.

For long-term operational activities, criteria pollutants were estimated for entire build-out of all 38 proposed wells, based on the assumption that eventually all 38 wells would be operating simultaneously. The results are presented in **Table 3-3**. As explained in the Project Description, O&M activities would involve a handful of trips per week, resulting in minimal emissions from mobile sources. Each well site would be landscaped, which would require maintenance activities and result in emissions from area sources. The proposed wells would consume electricity, which would be provided by Sacramento Municipal Utility District (SMUD). CalEEMod does not apportion indirect criteria pollutant emissions from electricity use to individual projects because SMUD is subject to U.S. EPA rules and regulations to control criteria pollutant emissions at power plants. By using electricity from a regulated power provider, it is assumed the proposed project's criteria pollutant emissions would be less than significant. Criteria pollutant emissions from the proposed stationary sources, the emergency generators, depends greatly upon the duration of use of the generators. For the purposes of this analysis, it was assumed each well site would be equipped with a 115 hp emergency generator which would be operated 24 hours per year; mass emissions are reported on an annual basis.

Table 3-3: Criteria Pollutant Emissions from Operations – Project Total

Phase	NO_X (lbs/ day)	ROG (VOC) (lbs/ day)	PM_{10} (lbs/ day)	PM_{10} (tons/ year)	$PM_{2.5}$ (lbs/ day)	$PM_{2.5}$ (tons/ year)
Energy	0.0	0.0	0.0	0.0	0.0	0.0
Mobile	0.3	0.09	0.26	0.05	0.07	0.01
Stationary	0.0	0.0	0.0	0.01	0.0	0.01
Area	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Mass Total	**0.3**	**0.1**	**0.26**	**0.06**	**0.07**	**0.03**
Operational Phase Mass emission thresholds (lbs/day)	*65*	*65*	*80*	*14.6*	*82*	*15*
Significant?	No	No	No	No	No	No

As shown in **Table 3-2** and **Table 3-3**, the proposed project would not produce criteria pollutant emissions that exceed SMAQMD thresholds of significance. Therefore, with incorporation of **Mitigation Measures AIR-1, AIR-2, AIR-3, and AIR-4,** impacts on regional air quality due to construction and operational-related criteria air pollutant emissions would be less than significant.

c) Less than Significant with Mitigation Incorporated

Sensitive receptors are facilities that house or attract people who are especially sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. Air quality impacts occur when sources of air pollutants and sensitive receptors are located near each other.

Sensitive receptors are located within the vicinity of the proposed wells. Long-term operational emissions of air pollutants would be well below SMAQMD significance thresholds and would be dispersed throughout the project area. Proposed project construction activities would result in emissions of dust and diesel particulate matter, which would have the potential to impact nearby sensitive receptors. Impacts would be temporary and below the SMAQMD thresholds of significance, which are designed to protect the health of sensitive receptors. Therefore, with incorporation of **Mitigation Measures AIR-1, AIR-2,** and **AIR-3,** impacts on sensitive receptors due to construction and operational-related criteria air pollutant emissions would be less than significant.

d) Less than Significant Impact

Odor impacts include health symptoms such as nausea and headache and are one of the most common sources of air pollution complaints and concerns from the public (CARB 2005). Odor impacts can also depend on meteorological conditions, such as prevailing winds, the distance between the odor source and receptor, and individual receptor sensitivity to odor. Certain land use types are associated with significant odor impacts including wastewater treatment plants, sanitary landfills, composting facilities, recycling plants, petroleum refineries, chemical manufacturing plants, painting/coating operations, and food packing plants. For these land use types, SMAQMD recommends (SMAQMD 2009) further analysis and consideration of odor reducing measures to minimize odor impacts on receptors within one to two miles.

Construction of the proposed project would involve the use of heavy-duty equipment that would generate odorous diesel particulate matter exhaust. Residential receptors would be located as close as 50 feet from the nearest well construction site. Most of the odor emissions would occur during daytime hours when meteorological conditions are favorable to dispersion. Furthermore, construction at any one site would be

temporary, as each well would be constructed within one year (six to eight months for active construction). As shown in **Table 3-2**, emissions of particulate matter, including diesel particulate matter, would be well below SMAQMD regional significance thresholds. As such, construction of the proposed project would not result in odors that would impact a substantial number of people and impacts would be less than significant.

Groundwater extraction wells are not a type of land use that is typically associated with nuisance odors. Therefore, long-term operation of the proposed project would not result in significant odor impacts on a substantial number of people.

Mitigation Measures:

To mitigate possible air quality impacts of the Project, the City shall implement **Mitigation Measures AIR-1, AIR-2, AIR-3** and **AIR-4**. With these mitigation measures incorporated, the Project impacts would be less than significant

AIR-1: Basic Construction Fugitive Dust Emissions Control Practices. The following Basic Construction Emissions Control Practices for controlling fugitive dust from a construction site shall be implemented during construction.

- Water all exposed surfaces two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).
- All roadways, driveways, sidewalks, parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.
- As required by SMAQMD Rule 403, and enforced by SMAQMD staff, fugitive dust emissions shall not be allowed beyond the property line from which construction originates. Reasonable precautions shall include, but are not limited to:
    - Use, where possible, of water or chemicals for control of dust in construction operations.
    - Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
    - Other means approved by the Air Pollution Control Officer.

AIR-2: Construction Diesel Exhaust Emission Control. The following practices, which describe exhaust emission control from diesel powered fleets, shall be implemented at the construction site. California regulations limit idling from both on-road and off-road diesel-powered equipment. The California Air Resources Board (CARB) enforces idling limitations and compliance with diesel fleet regulations.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.

- Provide current certificate(s) of compliance for CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation [California Code of Regulations, Title 13, sections 2449 and 2449.1].

AIR-3: Construction Equipment Inspection and Maintenance. Although not required by local or state regulation, the construction contractor shall have an equipment inspection and maintenance program to ensure work and fuel efficiencies. The program shall maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.

AIR-4: Phasing of Well Drilling. A maximum of two wells shall be in the drilling phase at any one time so that daily emissions of NO_X will not exceed the SMAQMD significance threshold for emissions.

3.4 Biological Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	[ ]	[X]	[ ]	[ ]
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	[ ]	[X]	[ ]	[ ]
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	[ ]	[X]	[ ]	[ ]

d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	[ ]	[ ]	[X]	[ ]
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	[ ]	[X]	[ ]	[ ]
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	[ ]	[ ]	[ ]	[X]

Discussion

A Draft Biological Resources Assessment Report for the proposed Project was prepared in July 2020. A literature review and field survey were performed to assess the biological resources of the proposed well site areas or "Study Area" (defined as the well site activity areas plus a 100-foot buffer). The complete *Biological Resources Assessment Report* is provided in **Appendix C.** Information from the report was used in the analysis herein.

a) Less than Significant with Mitigation Incorporated

Specific plant and wildlife species may be designated threatened or endangered and therefore are fully protected under the federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA). Under the California Fish and Game Code (CFGC), there are specific plant and wildlife species that are designated as Fully Protected Species and Designated Rare Plant Species even if not listed under CESA or the ESA. There are also special protections for nesting birds and bats, some of which are species-specific (such as federal Bald and Golden Eagle Protection Act (BGEPA), while other protections are for non-status species under the Migratory Bird Treaty Act (MBTA) of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513.

The California Department of Fish and Wildlife (CDFW) has developed a list of special species as "a general term that refers to all of the taxa that the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status." Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1, 2, and 3 are also considered special-status plant species and must be considered under CEQA (Species of Special Concern "SSC"). Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare.

Special Status Plants

Based upon a review of the resource databases, 23 special-status plant species have been documented in the vicinity of the Study Area. Seven of these plants have the potential to occur in the Study Area. The remaining species documented from the greater vicinity are unlikely or have no potential to occur.

Assessment level surveys conducted during a period sufficient to identify two of the seven special-status plant species with the potential to occur: pappose tarplant (*Centromadia parryi ssp. parryi*) and Pary's rough tarplant (*Centromadia parryi ssp. rudis*). These two species have peak blooming periods within the month of June and would be identifiable if present. No special-status species were observed during the June site visit. The remaining five special status plant species with potential habitat in the Study Area are summarized in **Table 3-4**.

Table 3-4: Potential Special-status Plants

Scientific Name	Common	Conservation	Well Sites with Habitat on or Nearby
Formally Listed Plants (FESA, CESA, CNPPA)			
No formally listed plants have the potential to occur			
Other Special-status Plants (CEQA, other)			
Brodiaea rosea	valley	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Fritillaria agrestis	stinkbells	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Navarretia	hoary	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Downingia pulsilla	dwarf	Rank 2B.2	Only occurs in depressional wetlands, which
Trifolium	saline clover	Rank 1B	Potential to occur in seasonal wetlands near

Three of the special-status plant species have the potential to occur within non-native grassland habitat within 11 well site areas (see **Table 3-4**). The special status plant species that could occur in grasslands are valley brodiaea (*Brodiaea rosea ssp. Vallicola*), stinkbells (*Fritillaria agrestis*), and hoary navarretia (*Navarretia eriocephala*). These species have their peak blooming periods in April and May and could not be identified during the June 2020 site visit. The other two species listed in **Table 3-4** occur in wetlands of some well site areas, (dwarf downingia (*Downingia pulsilla*) and saline clover (*Trifolium hydrophilum*), but because the well facilities would be sited to avoid wetlands, no impacts to these two species would be expected. None of these species are covered under the Natomas Basin Habitat Conservation Plan (NBHCP) which is discussed in detail under impact f) of this section. **Mitigation Measure BIO-1** would be implemented to reduce potential impacts to special-status plant populations. Surveys would be completed prior to construction to avoid observed populations or individual plant species found within each well site, to the extent practical.

Special Status Wildlife

No federal designated critical habitat was identified as occurring in the Study Area. As shown in **Table 3-5**, six special-status wildlife species have potential to occur in the immediate vicinity of or in portions of the Study Area.

Table 3-5: Potential Special-status Wildlife

Scientific Name	Common Name	Conservation Status	Well Sites with Habitat on or nearby
Formally Listed Wildlife (FESA, CESA)			
Branchinecta lynchi	Vernal pool fairy shrimp	FT	Well sites 2, 12, 13, 28, 29, 30, 37 have potential wetlands or other features onsite that may be suitable for VPHS
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	FT	Well sites 38 and 24 have Sambucus, the host plant for VELB
Buteo swainsonii	Swainson's Hawk	ST	Suitable habitat is present within some well sites and is located within 0.25 miles of all well sites
Other Special-status Wildlife (CEQA, other)			
Athene cunicularia	burrowing owl	SSC	This species has numerous documented occurrences in the vicinity of the Study Area and some sites contain burrows
Lanius ludovicianus	Loggerhead shrike	SSC	This species has been documented in the vicinity of the Study Area and may nest there
Elanus leucurus	White-tailed kite	CFP	This species has been documented in the vicinity and may next in trees and shrubs if they are available.

Swainson's hawk (*Buteo swainsonii)*, a CESA-listed raptor, regularly nests within the vicinity of the Project area and could use the proposed well sites as potential foraging habitat. No anticipated loss of habitat is anticipated due to the proposed Project; however, during construction some areas may be temporarily disturbed and Swainson's hawk (SWHA) may avoid the active construction areas at times. No nesting trees for SWHA would be removed for the proposed Project. If SWHA were to nest near a proposed well site, the construction activities could be sufficient to disturb the active nest to the extent that the active nest would be abandoned, which is considered "take" under CESA. To minimize potential impacts to SWHA nests prior to the start of construction, **Mitigation Measures BIO-2a and BIO-2b** would be implemented.

Burrowing owl *(Athene cunicularia)* is CDFW Species of Special Concern (SSC) that nests in ground burrow-like structures. Burrows are present at several proposed well sites and could be used as potential habitat for burrowing owl. To minimize the potential impact to potential burrowing owl, **Mitigation Measure BIO-3** requires a pre-construction survey to avoid the direct removal or destruction of active nests or occupied habitat.

Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)* (VELB), a Federal-threatened species, lives in elderberry (*Sambucus*) bushes. The proposed Project may potentially impact VELB by removing its host plant. **Mitigation Measure BIO-4** requires a survey for VELB prior to construction to minimize impacts.

Vernal Pool Fairy Shrimp *(Branchinecta lynchi)* (VPFS) is a broad-ranging federal-listed vernal pool crustacean that lives in wetlands, vernal pools, and man-made features such as ditches. VPFS can occupy pools of water for 3-4 weeks. Implementation of **Mitigation Measures BIO-5a** and **BIO-5b** would minimize impacts to VPFS by allowing construction to occur during the dry season or conducting surveys for VPFs prior to the start of construction.

Nesting Birds. There are many trees within and surrounding the proposed well sites, which could be used as potential nesting sites and habitat for the white-tailed kite *(Elanus leucurus)*, loggerhead shrike (*Lanius ludovicianus)*, and common nesting birds. Construction activities could result in the direct removal or destruction of active nests and their habitats through noise and the removal of vegetation. To minimize impacts, **Mitigation Measure BIO-6** requires a pre-construction survey for active bird nests prior to the start of construction.

Roosting Bats. Well sites have potential to support day roosting bats where trees are present, however trees in the well sites are not large enough to support maternity roosts for bats. No buildings or trees that would support maternity roosts would be removed or demolished as part of the proposed Project.

With the implementation of Mitigation Measures, impacts to special-status plant and wildlife species would be less than significant.

b) Less than Significant with Mitigation Incorporated

Seven land cover types were observed within the Study Area of the well sites: developed, landscaped, non-native grassland, seasonal wetlands, drainage canals, ditch, and artificial pond. Sensitive land cover types within each well site areas are illustrated in Figure 4 in Appendix C. The non-sensitive land cover types in the well site areas include non-native grasslands, landscaped and developed areas, and artificial pond, while the sensitive communities include the streams (drainage canals and ditches) and seasonal wetlands.

Two sensitive natural communities: seasonal wetlands and creeping ryegrass flat are present at Well Sites 2, 12, 13, 28, 29, 30, and 37. Project activities may directly or indirectly impact seasonal wetlands. These seasonal wetlands are regulated by the RWQCB under the Clean Water Act (CWA) Section 401 and the Porter-Cologne Water Quality Control Act. With the exception of Well Site 2, none of these seasonal wetlands are regulated by the U.S. Army Corps of Engineers (Corps) under the CWA Section 404 because they do not have direct connectivity to intermittent or perennial streams. However, the seasonal wetland at Well Site 2 is considered both RWQCB and Corps jurisdiction, and is thus described as a potential impact to Waters of the State and Waters of the U.S. Because seasonal wetlands are regulated by the RWQCB, an impact to the community is considered a potentially significant impact. To reduce potential impacts to seasonal wetlands, **Mitigation Measures BIO-7a, BIO-7b,** and **BIO-5a** would be implemented. Creeping ryegrass flats are only present at Well 28; this habitat is considered sensitive by CDFW. To minimize impacts to the creeping ryegrass flat, **Mitigation Measure BIO-8** would be implemented by creating a buffer surrounding the habitat. With the implementation of these mitigation measures, the impacts to riparian habitat and sensitive species would be less than significant.

c) Less than Significant with Mitigation Incorporated

Direct impacts to potential Section 404 wetlands are avoided due to the preferential siting of project activities in areas that do not contain these features. Potential for indirect impacts exist at Well Sites 2, 24, 28, and 30, as areas of proposed activities and staging are located within 100-feet of a drainage canal or ditch and no levee is present between the feature and the activity areas. Furthermore, one seasonal wetland located at Well Site 2 is potentially impacted by well site activities, and due to its location adjacent to, and directly connected to a potential jurisdictional drainage canal this feature would be a jurisdictional Waters of the U.S. regulated by the Corps. Potential direct and indirect impacts to jurisdictional wetlands and non-wetland Waters of the U.S. are considered a potentially significant impact. To reduce impacts, **Mitigation Measures BIO-7a, BIO-7b,** and **BIO-5a** would be implemented, requiring construction to occur during dry season, and specifying the needs for a wetland delineation, and the avoidance of any wetlands within the proposed well site area. With implementation of these mitigation measures, the impacts to federal protected wetlands would be less than significant.

d) Less than Significant Impact

No portions of the Study Area provide connectivity between areas of suitable habitat. For terrestrial species, all portions of the Study Area are within a greater context of urban development, and for aquatic species, there is no connectivity between the Study Area and upstream freshwater habitats. No impact would occur to migratory corridors for terrestrial and aquatic species.

Migratory birds may use portions of the Study Area opportunistically, however, the overwhelming majority of higher quality habitat along the Pacific Flyway exists outside the Study Area. Most of the Study Area is developed or supports disturbed habitats embedded in a highly urbanized setting. Based on these factors, the proposed Project would result in a less than significant impact to migratory corridors and habitat linkages.

e) Less than Significant with Mitigation Incorporated

Local plans and policies related to biological resources examined in this analysis are:

- City of Sacramento General Plan Wetland Protection
- City of Sacramento Tree Ordinance

The City of Sacramento 2035 General Plan contains the following policy regarding protection of wetlands:

> ER 2.1.6 Wetland Protection: "*The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands, to the extent feasible. If not feasible, the mitigation of all adverse impacts on wetland resources shall be required in compliance with State and Federal regulations protecting wetland resources, and if applicable, threatened or endangered species. Additionally, the City shall require either on- or off-site permanent preservation of an equivalent amount of wetland habitat to ensure no net-loss of value and/or function*."

Several potential wetlands are present within the well site areas as discussed under impact b) and c) above. Potential direct and indirect impacts to wetlands may occur and are subject to the General Plan ER. 2.1.6, which requires on- or off-site preservation of equal amounts of wetlands impacted. Implementation of: **Mitigation Measures BIO-5a,** and **BIO 7a and BIO 7b,** would reduce potential impacts to less than significant.

The City of Sacramento Tree Ordinance requires approval for the regulated work to City Trees for public projects (Section 12.56.040). Regulated work includes planting, removal, or work which may adversely impact the health of trees on City property. The Ordinance defines a "City Tree" as:

> *Any tree the trunk of which, when measured at 4.5 feet above ground is partially or completely located in a city park, or on real property the city owns…"*

If a public project may potentially remove City Trees, and avoidance is not feasible, the city project manager shall provide written justification to the director of the need to remove City Trees for the public project. City Trees that have a diameter at standard height (DSH) of 4 inches or more require approval of the director. If the DSH is less than 4 inches, the tree shall be removed as provided in Section 12.56.030.C.

The proposed Project may require removal of trees covered by City of Sacramento Tree Ordinance for construction and/or access. All trees on City property qualify as City Trees, as described in Section 12.56.20 of the Tree Ordinance. Removal of City Trees for public projects requires approval by the director, as

outlined in Section 12.56.40 of the ordinance. Based on site assessments, 16 of the Well Sites (2, 3, 4, 5, 7, 8, 9, 16, 21, 23, 26, 27, 30, 32, 35, and 36) contain trees within the well activity area. Some or all of these trees may have regulated work conducted, as described in Section 12.56.20, as part of the proposed Project. As City Trees are defined by a local ordinance, potential direct and indirect impacts are considered a potentially significant impact. Implementation of **Mitigation Measure BIO-9** would reduce potential impacts to City Trees to a less-than-significant level.

f) No Impact

A portion of the City of Sacramento is located within the Natomas Basin Habitat Conservation Plan (NBHCP). Five of the proposed well sites (Well sites 15, 19, 20, 23, and 39) are located within the NBHCP area. The NBHCP was adopted by the City of Sacramento, Sacramento County, and Sutter County in 2002 and is a conservation plan intended in part to satisfy the requirements for the Endangered Species Act. The purpose of the NBHCP is to promote biological conservation in conjunction with economic and urban development within the Natomas area. The Plan applies to approximately 53,537 acres of the Natomas Basin, located in the northern portion of Sacramento County and southern portion of Sutter County. The Basin contains incorporated and unincorporated areas within the jurisdictions of the City of Sacramento, Sacramento County, and Sutter County. While the southern portion of the basin is urbanized, most of the basin is currently used for agriculture. The NBHCP establishes a multi-species conservation program designed to allow for continued development within the Natomas Basin while mitigating the anticipated impacts to habitats and the incidental take of protected species resulting from development. Additionally, any species listed as sensitive within the NBHCP, or other local plans, policies and ordinances are likewise considered sensitive in the NBHCP area.

The NBHCP requires that the area surrounding a project located within the boundaries of the NBHCP be assessed to determine whether certain species and/or habitats that could potentially support special-status species are present. The area to be assessed ranges from a 200-foot radius surrounding the project site (for giant garter snake [*Thamnophis gigas*]) to a 0.5-mile radius surrounding the Study Area (for Swainson's hawk [*Buteo swainsoni]).* Projects located within the NBHCP area may obtain permits and mitigation coverage for any impacts to a covered species, through payment of in-lieu fees to the NBHCP. Projects receiving permits through the NBHCP must also implement avoidance and minimization measures included in the NBHCP to reduce the potential for take of covered species. These measures are outlined in Chapter 5 of the NBHCP.

The City of Sacramento is a signatory to the NBHCP. As such, the City will abide by provisions of the NBHCP for any impacts that may occur to covered biological resources within the required radius of the well site areas and coordinate with the City's New Growth Manager (City's HCP Designee). Therefore, no conflicts with the NBHCP would be expected and no impact would occur.

Mitigation Measures:

To mitigate possible biological resource impacts of the Project, the City shall implement **Mitigation Measures BIO-1, BIO-2a, BIO-2b, BIO-3, BIO-4, BIO-5a, BIO-5b, BIO-6, BIO-7a, BIO-7b, BIO-8,** and **BIO-9**. With these mitigation measures incorporated, the Project impacts would be less than significant.

> **BIO-1:** Conduct protocol-level special-status plant surveys in April and May within areas of non-native grassland and suitable wetlands at Well Sites 7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32 and 37. The surveys shall be performed in accordance with those described by resource experts and agencies (CNPS 2001, CDFW 2018a, USFWS 1996). If individuals or populations are observed, they shall be mapped and notes regarding size of population, quality of habitat and potential threats taken. Populations shall be avoided to the greatest extent practical, with a recommended minimum 25-foot buffer from the edge

of the population. Prior to Project activities within the vicinity of the populations, the population and associated 25-foot buffer shall be flagged or otherwise made visible. No work shall occur within that flagged area and personnel shall avoid entering the area to the greatest extent practical.

If avoidance of a population or individual is not practical, a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted for the species being impacted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the species being impacted, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for either percent cover or number of individuals. The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

BIO-2a: Initial ground disturbing activities will commence outside of the SWHA nesting season (March 1- September 15).

BIO-2b: If initial ground disturbing activities will commence during the SWHA nesting season (March 1- September 15), surveys based on CDFW's survey protocol shall be conducted. These surveys will include a pre-arrival assessment conducted between January 1 and March 1, to identify areas with suitable nesting sites within 0.25 miles of the Well Sites that will have activity in that year. The survey extent will include areas up to 0.5 miles for Well Sites located in the Natomas Basin Habitat Conservation Plan (NBHCP) area (Well Sites 15, 19, 20, 23 and 39). For Well Sites determined to have suitable nesting habitat within 0.25 miles or within 0.5 miles in the NBHCP area surveys will be conducted for SWHA nesting during the nest-building period (April 1-April 30) if work will begin between April 1 and May 30). For activities that will commence after June 1, surveys for active nests will be conducted between June 1 and August 1. Any active nests shall be avoided at a distance sufficient to ensure that nest abandonment will not occur, and this distance shall be determined through observation of the nest by a qualified biologist.

BIO-3: An assessment survey for burrowing owls shall be conducted at all well sites by a qualified biologist in the year of construction prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) regardless of time of year. The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or ground disturbing activities if these activities commence between February 1 and August 31, the timeframe that corresponds to the burrowing owl nesting season. If the results of the surveys indicate that burrowing owl may be impacted by project activities or if the Well Site is in the NBHCP area, the following measure shall apply:

- Preconstruction surveys in accordance with CDFW (CDFG) burrowing owl guidelines shall be conducted, summarized as: The Project Area and surrounding area (up to 500 feet if habitat has potential to support burrowing owl and no barriers preclude burrowing owls) shall be traversed on foot to detect burrowing owls. The survey will be conducted using transects spaced no more than 50 feet apart. For sites determined to have potential to support nesting burrowing owls, at least 3 site visits for burrowing owl shall occur between April 15 and July 15, with at least one site visit after June 15. Visits are to be at least 15 days apart.

- If any burrowing owl nest is identified during preconstruction surveys, the applicant shall comply with all CDFW [CDFG] guidelines regarding the minimization of impacts to the burrowing owl, including not disturbing an occupied nest during nesting season (February 1 through August 31) unless a qualified biologist approved by the Department verifies through noninvasive methods that either:

  (1) the owls have not begun egg-laying and incubation; or

(2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

- Any owls identified in the preconstruction surveys shall be relocated to appropriate locations using passive relocation techniques approved by the CDFW [CDFG] and mitigation for impacts to burrowing owl nests shall be provided and funded by the applicant in accordance with CDFG guidelines and requirements.

BIO-4: Prior to initial ground disturbance, a survey for the valley elderberry longhorn beetle (VELB) host plant, *Sambucus*, will be conducted at all sites where *Sambucus* has been detected (Well Sites 38 and 24) and all sites within the NBHCP. *Sambucus* plants, if detected, shall be avoided by at least 20 feet from the dripline of the plant and this avoidance buffer shall be clearly demarcated using lathe and flagging. If *Sambucus* plants with a stem diameter of greater than 1 inch cannot be avoided, they shall be inspected for evidence of VELB presence and if any evidence of VELB is detected, the plants shall be avoided and consultation with the USFWS shall occur to determine next steps, which may include relocation of the plant. If the Well Site where the *Sambucus* is located is in the NBHCP, new consultation would not be required, but removal of *Sambucus* shall be conducted and mitigated for in accordance with the NBHCP.

BIO-5a: Ground disturbance activities at Well Sites 2, 24, 28, and 30 shall be conducted in the dry season (May through October) and work at other sites shall be in the dry season to the greatest extent practical. Work within 200 feet of wetlands and ephemeral ditches will occur only in the dry season (June 1-October 31) and only in dry soils. Wetlands will be avoided by at least 100 feet and best management practices shall be implemented to prevent any potential increased erosion of sediment or turbid water from project activities into these features. If work is to be conducted from November through April, silt fencing shall be installed prior to ground disturbance around the perimeter and associated 25-foot buffer of avoided wetlands and the top of bank of drainage canals. Silt fencing adjacent to drainage canals shall be installed the greatest distance possible from the top of bank, while still maintaining prevention of runoff into the feature

BIO-5b: Prior to initial ground disturbance, protocol-level surveys for vernal pool fairy shrimp (VPFS) will be conducted at all sites with potential to support VPFS (Well Sites 2, 24, 28, and 30). If VPFS are detected, and cannot be avoided, a permit for take coverage of the species, pursuant to the Federal Endangered Species Act will be acquired prior to commencement of Project Activities.

BIO-6: A survey for active bird nests shall be conducted at all well sites by a qualified biologist no more than 14 days prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) if ground disturbing activities commence during the nesting season (February 1 through August 31). The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or grading activities. For white-tailed kite, the survey area shall extend at least 0.25 miles from the area of potential disturbance. Based on the results of the pre-construction breeding bird survey, the following measure shall apply:

- If active nests of protected species are found within the Well Site, or close enough to the area to affect nesting success, a work exclusion zone shall be established around each nest. Established exclusion zones shall remain in place until all young in the nest have fledged or the nest otherwise becomes inactive (e.g. due to predation). Appropriate exclusion zones shall be established by a qualified biologist; sizes vary dependent upon bird species, nest location, existing visual buffers, ambient sound levels, and other factors; an exclusion zone radius may be as small as 25 feet (for

common, disturbance-adapted species) or more than 250 feet for raptors. Listed species are typically provided more extensive exclusion zones, which may be specific to the species and/or follow CDFW guidance. Exclusion zone size may also be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

BIO-7a: A wetland delineation shall be conducted at Well Sites 2, 12, 13, 28, 29 30 and 37 to collect information on the three wetland parameters at each of the potential wetlands, according to the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Arid West data forms shall be filled out and a report on the results will be provided. The report will provide the information and results of the delineation. A final jurisdictional determination shall be obtained from the Corps if deemed necessary.

BIO-7b: Any wetlands within the Study Area shall be avoided. A 25-foot buffer around the perimeter of each wetland shall be included and avoided. Prior to ground disturbance, the 25-foot buffer shall be clearly flagged by a qualified biologist. If wetlands cannot be avoided, appropriate permits shall be obtained from the appropriate regulatory agencies (e.g., RWQCB and Corps). Mitigation measures outlined in the permits shall be followed; however, mitigation ratios shall be no less than 1:1 for impacted wetland acreage, which follows the City of Sacramento General Plan EIR. 2.1.6, which requires on- or off-site preservation of equal amounts impacted. If impacts to seasonal wetlands shall occur, mitigation may include, but are not limited to on-site restoration/enhancement/creation, or purchase of credits at an approved mitigation bank. **Mitigation Measure BIO-5a** as described above shall also be implemented for the protection of wetlands.

BIO-8: Prior to ground disturbance or staging of materials at Well 28, the edge of the creeping ryegrass flats and associated 10-foot buffer shall be flagged by a qualified biologist and shall be avoided. If Project activities cannot avoid the buffered area, then a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the creeping ryegrass flat, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for percent cover. The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

BIO-9: For trees that cannot be avoided, any removal of City Trees shall follow the guidelines outlined in the City of Sacramento Tree Ordinance Section 12.56.40, and permits shall be acquired as outlined in Section 12.56.050. In the event that a tree must be removed, the City will seek to plant a new or similar replacement tree that is drought tolerant on the same site.

3.5 Cultural Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	[ ]	[X]	[ ]	[ ]

Discussion

To assess potential presence of cultural resources, a prehistoric and historic site records and literature search for a 250-foot radius from each of the 38 well site locations was completed by the California Historical Resources Information System, North Central Information Center, California State University Sacramento (CHRIS/NCIC File No. SCA-20-97 and 20-98). The CHRIS/NCIC records review noted the presence of 11 recorded cultural resources within or within a 250-foot radius of 11 well site locations. Twenty-eight (28) well site locations have no resources present within the 250-foot search area. No prehistoric archaeological sites are present at any of the 38 well site locations. Research completed for the proposed Project suggests a low potential for the presence of subsurface prehistoric and/or historic deposits either within or adjacent to the any of the 38 well site locations.

Eleven (11) resources located within or near 11 well site locations have been previously evaluated for inclusion on the National Register of Historic Places and/or California Register of Historical Resources. No other significant or potentially significant local, state or federal cultural resources/historic properties, landmarks, or points of interest have been identified in or adjacent to the 38 well site locations.

a) Less than Significant with Mitigation Incorporated

A review of the 11 well sites located within or near the 11 resources that have been reviewed for inclusion on the National Register of Historic Places and/or California Register of Historical Resources suggests that the installation of the 11 wells would have no effect or no adverse effect on any qualities that make the resources eligible for the two registers. It is possible that previously unidentified buried prehistoric or historic resources could be encountered during construction. **Mitigation Measures CUL-1a** and **CUL-1b** would be implemented to ensure that resources are protected. These measures would ensure that construction crews are trained to recognize and respect cultural resources, and that measures to avoid or minimize effects would be implemented if any resources are discovered.

b) Less than Significant with Mitigation Incorporated

No known archaeological resources are present at any of the well sites, but if previously undiscovered resources are encountered during construction **Mitigation Measures CUL-1a** and **CUL-1b** would be implemented to ensure that resources are protected.

c) Less than Significant with Mitigation Incorporated

The well sites are not considered likely to contain human remains, but in the event, human remains are encountered during construction, **Mitigation Measure CUL-1c** would be implemented to ensure that any remains are treated in accordance with state requirements and with appropriate dignity.

Mitigation Measures:

To mitigate possible cultural resource and tribal cultural resource impacts of the Project, the City shall implement **Mitigation Measures CUL-1a, CUL-1b,** and **CUL-1c**. With these mitigation measures incorporated, the Project impacts would be less than significant.

CUL-1a: Conduct Cultural Resources and Tribal Cultural Resources Sensitivity and Awareness Training Program Prior to Ground-Disturbing Activities. The City shall require the applicant/contractor to provide a cultural resources and tribal cultural resources sensitivity and awareness training program (Worker Environmental Awareness Program [WEAP]) for all personnel involved in project construction, including field consultants and construction workers. The WEAP will be developed in coordination with an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, as well as culturally affiliated Native American tribes. The City may invite Native American representatives from interested culturally affiliated Native American tribes to participate. The WEAP shall be conducted before any project-related construction activities begin at the project site. The WEAP will include relevant information regarding sensitive cultural resources and tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations.

The WEAP will also describe appropriate avoidance and impact minimization measures for cultural resources and tribal cultural resources that could be located at the project site and will outline what to do and who to contact if any potential cultural resources or tribal cultural resources are encountered. The WEAP will emphasize the requirement for confidentiality and culturally appropriate treatment of any discovery of significance to Native Americans and will discuss appropriate behaviors and responsive actions, consistent with Native American tribal values.

CUL-1b: In the Event that Cultural Resources or Tribal Cultural Resources Are Discovered During Construction, Implement Avoidance and Minimization Measures to Avoid Significant Impacts and Procedures to Evaluate Resources. If cultural resources or tribal cultural resources (such as structural features, unusual amounts of bone or shell, artifacts, or human remains) are encountered at the project site during construction, work shall be suspended within 100 feet of the find (based on the apparent distribution of cultural materials), and the construction contractor shall immediately notify the project's City representative. Avoidance and preservation in place are the preferred manner of mitigating impacts to cultural resources and tribal cultural resources. This will be accomplished, if feasible, by several alternative means, including:

- Planning construction to avoid tribal cultural resources, archaeological sites and/or other cultural resources; incorporating cultural resources within parks, green-space or other open space; covering archaeological resources; deeding a cultural resource to a permanent conservation

easement; or other preservation and protection methods agreeable to consulting parties and regulatory authorities with jurisdiction over the activity.

- Recommendations for avoidance of cultural resources and tribal cultural resources will be reviewed by the City representative, interested culturally affiliated Native American tribes and other appropriate agencies, in light of factors such as costs, logistics, feasibility, design, technology and social, cultural and environmental considerations, and the extent to which avoidance is consistent with project objectives. Avoidance and design alternatives may include realignment within the project site to avoid cultural resources or tribal cultural resources, modification of the design to eliminate or reduce impacts to cultural resources or tribal cultural resources or modification or realignment to avoid highly significant features within a cultural resource or tribal cultural resource.

- Native American representatives from interested culturally affiliated Native American tribes will be invited to review and comment on these analyses and shall have the opportunity to meet with the City representative and its representatives who have technical expertise to identify and recommend feasible avoidance and design alternatives, so that appropriate and feasible avoidance and design alternatives can be identified.

- If the discovered cultural resource or tribal cultural resource can be avoided, the construction contractor(s), will install protective fencing outside the site boundary, including a 100-foot buffer area, before construction restarts. The boundary of a cultural resource or a tribal cultural resource will be determined in consultation with interested culturally affiliated Native American tribes and tribes will be invited to monitor the installation of fencing. Use of temporary and permanent forms of protective fencing will be determined in consultation with Native American representatives from interested culturally affiliated Native American tribes.

- The construction contractor(s) will maintain the protective fencing throughout construction to avoid the site during all remaining phases of construction. The area will be demarcated as an "Environmentally Sensitive Area".

If a cultural resource or a tribal cultural resource cannot be avoided, the following performance standard shall be met prior to continuance of construction and associated activities that may result in damage to or destruction of cultural resources or tribal cultural resources:

- Each resource will be evaluated for California Register of Historical Resources- (CRHR) eligibility through application of established eligibility criteria (California Code of Regulations 15064.636), in consultation with consulting Native American Tribes, as applicable.

If a cultural resource or a tribal cultural resource is determined to be eligible for listing in the CRHR, the City will avoid damaging effects to the resource in accordance with California PRC Section 21084.3, if feasible. The City shall coordinate the investigation of the find with a qualified archaeologist (meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology) approved by the City and with interested culturally affiliated Native American tribes that respond to the City's invitation. As part of the site investigation and resource assessment, the City and the archaeologist shall consult with interested culturally affiliated Native American tribes to assess the significance of the find, make recommendations for further evaluation and treatment as necessary and provide proper management recommendations should potential impacts to the resources be determined by the City to be significant. A written report detailing the site assessment, coordination activities, and management recommendations shall be provided to the City representative by the qualified archaeologist. These

recommendations will be documented in the project record. For any recommendations made by interested culturally affiliated Native American tribes that are not implemented, a justification for why the recommendation was not followed will be provided in the project record.

Native American representatives from interested culturally affiliated Native American Tribes and the City representative will also consult to develop measures for long-term management of any discovered tribal cultural resources. Consultation will be limited to actions consistent with the jurisdiction of the City and taking into account ownership of the subject property. To the extent that the City has jurisdiction, routine operation and maintenance within tribal cultural resources retaining tribal cultural integrity shall be consistent with the avoidance and minimization standards identified in this mitigation measure.

If the City determines that the project may cause a significant impact to a tribal cultural resource, and measures are not otherwise identified in the consultation process, the following are examples of mitigation capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to the resource. These measures may be considered to avoid or minimize significant adverse impacts and constitute the standard by which an impact conclusion of less-than significant may be reached:

- Avoid and preserve resources in place, including, but not limited to, planning construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- Treat the resource with culturally appropriate dignity taking into account the Tribal cultural values and meaning of the resource, including, but not limited to, the following:
- Protect the cultural character and integrity of the resource.
- Protect the traditional use of the resource.
- Protect the confidentiality of the resource.
- Establish permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or using the resources or places.
- Protect the resource.

CUL-1c: Implement Procedures in the Event of the Inadvertent Discovery of Human Remains. If an inadvertent discovery of human remains is made at any time during project-related construction activities or project planning, the following performance standards shall be met prior to implementing or continuing actions such as construction, which may result in damage to or destruction of human remains. In accordance with the California Health and Safety Code (HSC), if human remains are encountered during ground-disturbing activities, the City shall immediately halt potentially damaging excavation in the area of the remains and notify the Sacramento County Coroner and a professional archaeologist to determine the nature of the remains. The Coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (HSC Section 7050.5[b]).

If the human remains are of historic age and are determined to be not of Native American origin, the City will follow the provisions of the HSC Section 7000 (et seq.) regarding the disinterment and removal of non-Native American human remains.

If the Coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (HSC Section 7050[c]). After the Coroner's findings have been made, the archaeologist and the NAHC-designated Most Likely Descendant (MLD), in consultation with the landowner, shall determine the ultimate treatment and disposition of the remains. The responsibilities of the City for acting upon notification of a discovery of Native American human remains are identified in California PRC Section 5097.9 et seq.

3.6 Energy

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	[ ]	[ ]	[X]	[ ]
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	[ ]	[ ]	[X]	[ ]

Discussion

Existing wells operated by the City already consume energy, which is supplied through connection to the Sacramento Municipal Utility District (SMUD) the electricity provider for the Project area.

a) Less Than Significant Impact

Construction of each well and destruction of existing wells would involve construction-related fossil fuel consumption from operation of diesel-powered construction equipment, and fossil fuel consumption from material hauling, delivery, and worker vehicle trips. Operation of each well would consume electricity, which would be provided by SMUD.

The proposed Project would not require unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy compared to projects of similar type and size. In addition, the construction fleet contracted for the proposed Project would be required to comply with the CARB In-Use Off-Road Diesel-Fueled Fleets Regulations, which would limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets with older-tier engines, and

establish a schedule for retiring older, less fuel-efficient engines from the construction fleet. Once construction is complete, the proposed Project would involve operational energy consumption. Because the project would replace wells that are currently out of service and would result in additional groundwater pumping it is estimated that operational energy use would increase by about 7 gigawatt-hours per year (GWh/year). Although energy is required for pumping, so as not to incur unnecessary costs, the City would be incentivized to use the most energy efficient pumps, compressors, and other equipment possible to minimize operational costs. Existing wells 124, 156, and 158 participate in the SMUD SolarShares program which reduces energy consumption; it is assumed that participation in that program would continue when those wells are replaced and it is possible other replacement wells could be added to the program as well. Furthermore, operation of the proposed Project wells would occur as part of an overall water supply management strategy and may be accompanied by limits in surface water diversions – and associated reduction in energy use – at the E.A. Fairbairn Water Treatment Plant during certain dry years (See discussion under *Section 2.2.2*). As such, construction and operation of the proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy during construction or operation and impacts would be less than significant.

b) Less Than Significant Impact

The City of Sacramento Climate Action Plan (CAP) was adopted in 2012 and incorporated into the General Plan. The plan includes a goal to "Provide for the energy needs of the city and decrease dependence on nonrenewable energy sources through energy conservation, efficiency, and renewable resource strategies." Specific policies include measures to improve energy efficiency of city facilities, reduce peak electric load, and encourage installation of renewable energy systems. The City also has policies to support SMUD program for energy conservation, energy efficiency and renewable energy. The proposed Project would rely on SMUD for electricity. Therefore, it would not conflict with the City CAP.

The City of Sacramento Climate Action Plan for Internal Operations (IO CAP) was adopted in 2016. The 2016 IO CAP identifies GHG reduction strategies in five main areas: Building Energy, Water Management, Streetlights and Signals, Vehicle Fleet and Fuels, and Urban Forestry. Water Management strategies include pumping efficiency and system optimization, low-maintenance landscaping, and long-term water savings strategies and drought-response. Vehicle Fleet and Fuels strategies include fleet efficiency and electric vehicle pledge, and alternative fuels. Building Energy strategies include a green building policy for new City buildings. The City would ensure applicable strategies from the 2016 IO CAP, or later version, are implemented by incorporating them into well design and operations and maintenance procedures. Applicable strategies may include:

- Project wells would be operated in accordance with the City "Lights & Equip Off" policy for reducing energy consumption from lights and computers when not in use.
- Project facilities would implement energy efficient lighting in accordance with City green building standards.
- Project wells would utilize water pumps that are consistent with City goals to reduce the energy intensity of water conveyance.
- Well sites would incorporate low-maintenance sustainable landscaping.
- Operations and Maintenance activities would be conducted in accordance with the City's low-emissions vehicle fleet and available clean fuel sources for trucks and heavy equipment.

By incorporating applicable strategies from the 2016 IO CAP into well design and operations and maintenance procedures, the proposed Project would not conflict with the 2016 IO CAP.

The City of Sacramento Department of Utilities adopted an Energy Management Policy in January 2020. Goals from the Energy Management Policy that could relate to the proposed Project are listed below. The City would ensure applicable strategies from the Energy Management Policy are implemented by incorporating them into well design and operations and maintenance procedures. Therefore, the proposed Project would not conflict with the Energy Management Policy. Applicable strategies may include:

- Consider energy efficiency in all aspects of planning, design, and operation, consistent with sound business practices
- Encourage procurement of energy-efficient products and services
- Pursue innovative and cost-effective energy management applications
- Track effectiveness of initiatives in reducing energy use
- Provide staff with training and education to recognize, plan, implement, and sustain energy savings from projects and improved procedures and operations

While increased groundwater pumping would increase operational energy use, as explained under question "b" above, the Project would not involve wasteful or inefficient energy consumption. Therefore, the Project would not conflict with the City CAP or 2016 IO CAP, which were developed to keep Citywide energy use in line with State reduction targets, nor would it conflict with the City Department of Utilities Energy Management Policy of 2020. Thus, the proposed Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Impacts would be less than significant, and no mitigation would be required.

Mitigation Measures: None required or recommended.

3.7 Geology and Soils

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or	[ ]	[ ]	[ ]	[X]

	based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				
	ii) Strong seismic ground shaking?	[ ]	[ ]	[X]	[ ]
	iii) Seismic-related ground failure, including liquefaction?	[ ]	[ ]	[X]	[ ]
	iv) Landslides?	[ ]	[ ]	[X]	[ ]
b)	Result in substantial soil erosion or the loss of top soil?	[ ]	[ ]	[X]	[ ]
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	[ ]	[ ]	[X]	[ ]
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	[ ]	[ ]	[X]	[ ]
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	[ ]	[ ]	[ ]	[X]
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	[ ]	[X]	[ ]	[ ]

a.i) No Impact

There are no Alquist-Priolo Fault Zones in the City so there would be no impact associated with rupture of a known fault. (City of Sacramento, General Plan EIR, 2015).

a.ii) Less than Significant Impact

Ground-shaking hazards for the City are among the lowest in the state so the probability of groundshaking affecting any facilities is remote and thus considered less than significant. (City of Sacramento, General Plan EIR, 2015).

a.iii) Less than Significant Impact

Areas susceptible to liquefaction are primarily those in proximity to the Sacramento River such as the Pocket and Natomas areas (City of Sacramento, General Plan EIR, 2015), where few wells are located. Because all facilities would be designed to meet applicable California Building Code requirements, liquefaction impacts would be less than significant.

a.iv) Less than Significant Impact

Because the entire City is on level terrain, landslide hazards would be less than significant (City of Sacramento, General Plan EIR, 2015).

b) Less than Significant Impact

Although all construction projects have the potential to result in erosion, construction of all facilities would be required to comply with the City's Grading Ordinance, which requires preparation of an Erosion and Sediment Control Plan before the start of any grading activity. With compliance with existing City requirements, erosion impacts would be less than significant.

c) Less than Significant Impact

Because the City is flat, slope stability and other soil stability hazards are typically not an issue for construction of facilities. Additionally, adherence to the California Building Code and City policies requiring evaluation of soil would result in the maximum practicable protection available for users of buildings and infrastructure and their associated trenches, slopes, and foundations, ensuring that impacts would be less than significant.

d) Less than Significant Impact

Most of the City is underlain by soils that exhibit low expansion (City of Sacramento, General Plan EIR, 2015). City requirements for evaluation of soil conditions before construction would ensure that unsuitable soil conditions at any well sites or sewer and water lateral connections are identified and that measures to eliminate inappropriate soil conditions are implemented. Adherence to California Building Codes requirements and compliance with City policies would ensure that impacts are less than significant.

e) No Impact

The project does not entail construction of septic or other wastewater disposal systems, so this impact is not applicable to the project.

f) Less than Significant Impact with Mitigation Incorporated

The proposed well sites are located within three different geologic formations: artificial fill, Holocene-age deposits, and Pleistocene-age Riverbank Formation. Artificial fill, which is disturbed, and Holocene-age deposits, which are too young to contain fossils, both have a low potential for containing paleontological resources. The Pleistocene-age Riverbank Formation has a moderate potential to contain fossils. Of the 38 well sites, 17 are in Holocene-age deposits and thus have low potential to contain fossils, while 21 are in Pleistocene-age River Bank Formation, which has a moderate potential to contain fossils. Some sites in both formations may be overlain in artificial fill. Some sites in both formations may be overlain in artificial fill (Paleo Solutions 2020) . Project construction has the potential to damage important paleontological resources, which is a potentially significant impact. Surface grading or shallow excavations in artificial fill (which may overlie older intact formations) or in sediments with low potential for fossils is unlikely to impact resources. While well drilling could damage fossils, the well shaft is limited in aerial extent (8 to 16 inches in diameter), which limits the potential for damage. Potential for adverse impacts is primarily limited

to excavations in previously undisturbed deposits for construction of underground pipelines for water and sewer connections, or if grading extends into areas of undisturbed Pleistocene-age Riverbank formation (Paleo Solutions 2020). **Mitigation Measure GEO-1** would be implemented to ensure that if any fossils are encountered the find would be preserved and documented.

Mitigation Measures

To mitigate possible paleontological resource impacts of the Project, the City shall implement **Mitigation Measure GEO-1**. With this mitigation measure incorporated, the Project impacts would be less than significant.

> **GEO-1: Unanticipated Fossil Discovery.** Prior to the start of construction, a qualified paleontologist shall be retained to prepare a paleontological resources Worker Environmental Awareness Program (WEAP) training. The WEAP training will include the types of fossils that may be encountered, the procedures to be followed if unanticipated paleontological resources are unearthed at the Project site, contact information for the paleontological personnel, and the regulatory requirements for the protection of paleontological resources. All earthmoving personnel and their supervisors shall receive the WEAP training prior to beginning work on the site.
>
> In the event of unanticipated paleontological resource discoveries, all activities in the vicinity of the discovery (50-foot buffer) shall be temporarily halted until a qualified paleontologist has documented and evaluated the resource(s), completed the appropriate mitigation and treatment of the resource(s), and authorized work in the discovery area to resume. If determined to be significant, the paleontological resource(s) shall be collected and transferred to a paleontological laboratory for preparation, identification, and analysis, and curated at an accredited fossil repository. If paleontological resources are discovered, and upon conclusion of ground disturbing activities, a paleontological mitigation report shall be prepared that documents the dates of field work, methods, fossil analyses, significance evaluations, conclusions, and an itemized list of specimens.
>
> Additionally, in the unanticipated event that native sediments of geologic units with moderate paleontological potential (PFYC 3) are encountered in the subsurface during site grading, pipeline excavations, or on-site well equipment excavations, a qualified paleontologist shall be consulted to determine the need for additional paleontological mitigation in that area (e.g., paleontological monitoring or spot checking).

3.8 Greenhouse Gas Emissions

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	[X]	[ ]	[ ]	[ ]
b) Conflict with an applicable plan, policy or regulation adopted for the	[X]	[ ]	[ ]	[ ]

purpose of reducing
the emissions of greenhouse gases?

Discussion

a) Potentially Significant Impact

SMAQMD provides recommended thresholds to determine if individual projects would generate greenhouse gas (GHG) emissions that may have a significant impact on the environment. The primary GHGs of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Total emissions of all GHGs are quantified in this analysis in terms of metric tons of carbon dioxide equivalents (CO_2e). The SMAQMD significance thresholds are presented in **Table 3-6**. The thresholds include required best management practices for operational emissions.

Table 3-6: SMAQMD Greenhouse Gas Emissions Thresholds

	Construction Phase	Operational Phase
GHG as CO_2e	1,100 MT/year	1,100 MT/year*
**With incorporation of SMAQMD's Tier 1 Best Management Practices (BMPs): BMP 1: no natural gas, BMP 2: Electric Vehicle Ready.*		

The proposed Project would result in emissions of GHG from both construction and operational activities. Heavy-duty construction equipment, worker trips, vendor trips, and material hauling trips result in GHG emissions from the burning of fossil fuels. Once operational, the wells would result in indirect GHG emissions associated with electricity demand from the local utility provider, SMUD. It was assumed that the proposed wells would start to become operational as soon as 2022.

GHG emissions were estimated using CalEEMod version 2016.3.2, consistent with the Project-specific information described in the Project Description and *Section 3.3 Air Quality*. CalEEMod default GHG intensity values were used for N_2O and CH_4; for CO_2, the carbon intensity factor from the most recent three years of reporting available from The Climate Registry (The Climate Registry 2020) was used as an approximation of the SMUD CO_2 intensity factor in the year the proposed Project would become operational. Modeling assumptions and modeling results are provided in Appendix B.

Table 3-7 shows that GHG emissions during the construction phase of the Project for one well would be below the SMAQMD threshold. Therefore, construction generated GHG emissions would be less than significant.

Table 3-7: Greenhouse Gas Emissions from Construction - Each Well

Construction Phase	$MTCO_2e$/year
Site Preparation	8.9
Mobilization	1.0
Test Well Drilling	110.2
Test Well Testing	1.9
Production Well Drilling/ Construction	146.2
Production Well Development/ Testing	18.5
Demobilization	1.5
Well Equipping Construction	166.8
Well Destruction/ Demolition	3.5
Site Paving/ Landscaping	6.3
Total	**465**
Significance Threshold	*1,100*
Significant?	No

Annual operational GHG emissions were modeled for the first full year that all 38 wells would be fully online. Consistent with project-specific information in the Project Description and *Section 3.3 Air Quality*, it was assumed O&M activities would involve at most one worker trip to each well per day. The well sites would require a minimal amount of landscape maintenance activities, but the net amount of water required for landscape irrigation would result in negligible GHG emissions, especially if drip irrigation is used. The City has reduced its vehicle fleet GHG emissions through its Fleet Efficiency and Electric Fleet Pledge, and through its Alternative Fuels strategy. In 2013, seven of the 1,819 vehicles in the City fleet were electric and 40 were gasoline-hybrids; by 2020, the City intended to add 10 more electric vehicles and 13 more gasoline-hybrid vehicles to its fleet (2016 IO CAP). The values presented in **Table 3-8** conservatively assume CalEEMod default emission rates for the vehicle fleet that would perform operations and maintenance work at the proposed wells. It is possible that a more efficient vehicle fleet would be used at the proposed wells. More information about the specific vehicle fleet that would service the proposed Project, and the associated reduction in mobile-source GHG emissions will be analyzed in the EIR.

Operation of the proposed wells would consume electricity which would be provided by SMUD. It was conservatively assumed that SMUD's carbon intensity factor would remain static over the next 15 years until all 38 wells are fully operational, although SMUD has pledged to gradually reduce the carbon intensity of the electricity it delivers in the future (SMUD 2018). Further, it was assumed that each well would be equipped with a 115 hp diesel-powered emergency generator that would operate 24 hours out of the year.

The proposed Project would not include the use of natural gas, consistent with SMAQMD Tier 1 GHG Best Management Practices (SMAQMD 2009). To be conservative, for the purposes of the analysis in this Initial Study, annual operational electricity consumption from all 38 proposed wells was modeled under a dry/critically dry water year type. Under this scenario, the City would extract the maximum amount of groundwater from the 38 wells, and the net increase in energy requirements would be 9,740 MWh per year over the baseline energy requirements of the existing wells. Existing wells 124, 156, and 158 participate in the SMUD SolarShares program; it is assumed that participation in that program is part of the baseline energy demand of those wells and would continue when those wells are replaced.

As explained in the Project Description *Section 2.2.2*, under dry water year types and periods where river flows are below criteria set by Judge Hodge, the City limits its diversions from the American River to the E.A. Fairbairn Water Treatment Plant. During these periods, however, the City can continue to divert American River entitlements at its Sacramento River water treatment facility, subject to the capacity restrictions of that facility. Therefore, it can be assumed that under a dry year scenario, energy consumption

at the Fairbairn Plant would not be at full capacity and the operation of the 38 proposed Project wells would occur alongside energy savings at the Fairbairn Plant, while the Sacramento River facility would operate at full capacity. In calendar year 2019, which was classified as a "wet" hydrologic water year in the Sacramento Valley, the Fairbairn Plant used 11,355 MWh of electricity and 1,221 MWh of natural gas. Approximately 10% of the Fairbairn Plant's electricity demand is met by onsite solar; the remainder is met by SMUD. The GHG emissions reduction resulting from energy savings from reduced diversion and treatment at the Fairbairn Plant under a dry year scenario will be analyzed in the EIR. For this Initial Study, the more conservative operational GHG emissions are presented in **Table 3-8,** and assume energy demands of the proposed wells without energy savings from diversion and treatment reductions at the Fairbairn Plant.

Two existing City wells that are currently pending permitting by the DDW would emit methane: Well 165 and Well 167. Well 165 and 167 would produce groundwater at approximately 2,800 gpm and 2,200 gpm, respectively. Methane would be removed from the well by adding a vent tube to the well cap. According to samples from these two wells (Alpha Analytical 2020), the concentration of methane in the water would be as high as 9.8 mg/liter at Well 165 and as high as 6.6 mg/L at Well 167. Well 165 would produce approximately 2,800 gpm, or 5.6 billion liters per year, and Well 167 would produce approximately 2,200 gpm, or 4.4 billion liters per year, of groundwater. At a concentration of 9.8 mg/L of methane, Well 165 would emit 54.9 metric tons of methane per year. At a concentration of 6.6 mg/L, Well 167 would emit 29.0 metric tons of methane per year. As a greenhouse gas, methane has 25 times more of a warming affect than the equivalent amount of carbon dioxide (EPA 2020); therefore, the carbon dioxide equivalent would be 2,100 MT CO_2e from methane emissions from the wells. For replacement wells under the proposed Project, the presence of methane would not be known until after the well is drilled. Groundwater produced from the Mehrten formation is known to contain methane and may require treatment before potable distribution. The City's approach to disposing or treating methane gas, if it is present at the proposed wells, is unknown at this time. Potential approaches may include: venting the methane at the well; disposing of the methane gas via combustion at the well sites; installing a form of packed column treatment whereby the media at the well pump absorbs the methane as it passes through; or installing a gas shroud on the well pump to reduce or eliminate methane production. Because the City's approach to disposing or capturing methane gas is unknown this time, for the analysis in this Initial Study, the more conservative GHG emissions are presented in **Table 3-8,**assuming the methane gas would be released through a vent at the wellhead with no treatment or capture technologies in place.

As shown in **Table 3-8**, without mitigation, GHG emissions from operation of all new project wells would exceed the SMAQMD significance threshold resulting in a potentially significant impact.

Table 3-8: Greenhouse Gas Emissions from Operations – Total Project

Category	$MTCO_2e$/year
Energy	1,990
Mobile	47
Stationary	40
Area	0.04
Well Methane	2,100
Total	**4,177**
Significance Threshold	*1,100 MT/year*
Significant?	Yes

The proposed Project would incorporate all applicable GHG reduction measures that have been adopted under the City of Sacramento Climate Action Plan for Internal Operations (2016 IO CAP), and would follow existing policies to reduce energy consumption, including the CARB In-Use Off-Road Diesel-Fueled Fleets Regulations and the City of Sacramento Energy Management Policy discussed in *Section 3.6*.

However, operation of the proposed Project still has the potential to result in GHG emission impacts that are cumulatively considerable as a result of operational energy use associated with the production wells and potential methane releases. Impacts will be further addressed in the EIR, including potentially modeling different combined well operations, surface water production, and conservation scenarios; SolarShare participation; and possibly offsetting the proposed Project's GHG emissions through the purchase of verifiable carbon offsets.

b) Less than Significant Impact

The applicable plans, policies, and regulations include:

- The CARB 2017 Climate Change Scoping Plan, which established the strategy to achieve California's greenhouse gas reduction target of 40% below 1990 levels by 2030 and set the path towards achieving the statewide 2050 target of 80% below 1990 levels (SMAQMD 2009);

- The City of Sacramento 2035 General Plan, Appendix B, General Plan Climate Action Plan Policies and Programs, which contains policies and programs to support adaptation & resiliency targets (City of Sacramento 2015); and

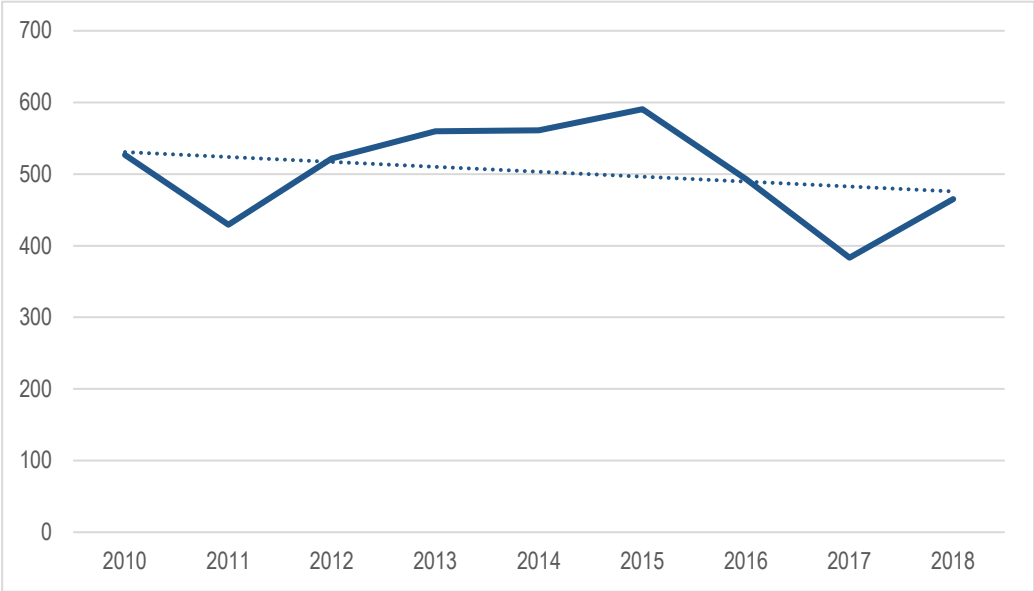
- The 2016 IO CAP, which was identified in the General Plan to be implemented to achieve the City's 2020 municipal GHG emissions reduction goals and review progress every five years. It analyzes actions necessary to achieve a 33% reduction in GHG emissions below 2005 levels by 2020 and positions the City to achieve long-term goals of reducing GHG 83% below 2005 levels by 2050 (City of Sacramento 2016).

In addition, the Mayor's Commission on Climate Change issued a report in June 2020 with recommendations for how the City, along with the City of West Sacramento, can achieve carbon-zero by 2045. The report focuses on recommendations to achieve zero net GHG emissions across both cities through implementing GHG reduction strategies for building energy use, transportation, land use planning, urban forestry, and sustainable food systems. It also recommends strategies for community climate resilience. The City declared a climate emergency on December 10, 2019 that includes the following resolution: "The 2040 General Plan Update and Climate Action Plan shall present the City's approach to achieve carbon neutrality by 2045 and emergency actions needed towards emissions elimination by 2030, building on recommendations and analysis from the Mayor's Commission on Climate Change, significant community outreach by City staff, and mitigation measures incorporated from climate experts, community members, and financial advisors."

CARB 2017 Climate Change Scoping Plan.

The *CARB 2017 Climate Change Scoping Plan* strategies to achieve the State GHG targets include: supporting clean technologies (e.g., solar and wind power, electric vehicles); extending the Cap-and-Trade Program and Low Carbon Fuel Standard programs; planning for walkable/bikeable communities; reducing waste; supporting working lands; and securing water supplies. The proposed Project intersects these strategies in the areas of clean technologies and securing water supplies. Approximately one-half of the Project emissions would result from indirect electricity consumption (see **Table 3-8**). SMUD's CO_2 intensity factor for its electricity supply has generally declined over the past decade (The Climate Registry 2020), as shown in **Figure 3-1**.

Figure 3-1: SMUD CO2 Emission Factor (lbs/ MWh)



Source: The Climate Registry 2020

According to SMUD's latest Sustainable Power Supply objective (SMUD 2018), its goal is to reduce GHG emissions to serve retail customer load to Net Zero carbon by 2040. As SMUD transitions to electricity sources that are less carbon intensive, the GHG emissions from the proposed Project would also decline. For example, when SMUD achieves a carbon intensity that is approximately half of what it currently is, annual proposed Project GHG emissions from electricity consumption would be around 900 $MTCO_2e$ and total annual emissions would be lower than 1,100 $MTCO_2e$. In this way, the proposed Project would not interfere with established statewide GHG reduction targets from electricity use for 2030 and 2050 established in the *CARB 2017 Climate Change Scoping Plan.* Furthermore, the *CARB 2017 Scoping Plan* calls for understanding of the water-energy nexus and meeting water demands under the realities of climate change and population growth. The Plan notes that about 12% of the total energy used in California is related to water, with 2% for conveyance, treatment and distribution, and 10% for end-customer uses like heating and cooling. The proposed Project continues the use of a local water supply, which reduces energy requirements associated with conveyance. Local supplies also support a diverse portfolio that is more likely to withstand uncertainty related to climate change and population growth. Therefore, the proposed Project would not interfere with strategies in the *CARB 2017 Climate Change Scoping Plan*.

City of Sacramento 2035 General Plan

Many of the policies and programs described in the City of Sacramento 2035 General Plan, Appendix B, General Plan Climate Action Plan Policies and Programs (City of Sacramento 2015) are aimed at land use patterns and design that reduce GHG emissions and support GHG adaptation, such as infill development, neighborhood connectivity, mixed use development, and open space conservation. Other policies and programs aim to reduce GHG through transportation demand management, mass transit, bicycle systems, renewable energy development, open space conservation, and urban forestry. The proposed Project would not influence planned land use, transportation demand, or renewable energy development and would not conflict with these General Plan policies. Furthermore, the proposed Project would directly support Goal U 2.1 from the General Plan, described below, which both reduces GHG emissions and supports citywide

climate change adaptation. Therefore, the proposed Project would not conflict with the policies and programs in the General Plan.

- Goal U 2.1 High Quality and Reliable Water Supply. Provide water supply facilities to meet future growth within the city's Place of Use and assure a high-quality and reliable supply of water to existing and future residents.
    - Goal U 2.1.2 Increase water supply sustainability. The City shall maintain a surface water/groundwater conjunctive use program, which uses more surface water when it is available and more groundwater when surface water is limited.

City of Sacramento Climate Action Plan for Internal Operations

The City of Sacramento 2016 IO CAP identifies GHG reduction strategies in five main areas: Building Energy, Water Management, Streetlights and Signals, Vehicle Fleet and Fuels, and Urban Forestry. Water Management strategies include pumping efficiency and system optimization, low-maintenance landscaping, and long-term water savings strategies and drought-response. Vehicle Fleet and Fuels strategies include fleet efficiency and electric vehicle pledge, and alternative fuels. Building Energy strategies include a green building policy for new City buildings.

The City would ensure applicable strategies from the 2016 IO CAP, or later version, are implemented by incorporating into well design and operations and maintenance procedures. Applicable strategies may include:

- Project wells would be operated in accordance with the City "Lights & Equip Off" policy for reducing energy consumption from lights and computers when not in use.
- Project facilities would implement energy efficient lighting in accordance with City green building standards.
- Project wells would utilize water pumps that are consistent with City goals to reduce the energy intensity of water conveyance.
- Well sites would incorporate low-maintenance sustainable landscaping.
- Operations and Maintenance activities would be conducted in accordance with the City's low-emissions vehicle fleet and available clean fuel sources for trucks and heavy equipment.

With incorporation of all applicable standard measures from the 2016 IO CAP, the proposed Project would not conflict with the 2016 IO CAP,

Construction GHG emissions would be lower than applicable thresholds and would not be cumulatively considerable. However, operational GHG emission levels could still potentially be cumulatively considerable, and impacts related to threshold "a" would be potentially significant. The proposed Project would not conflict with many of the strategies of applicable plans adopted for the purposes of reducing GHG emissions. However, because operational GHG emissions have the potential to exceed the numerical threshold established by SMAQMD, and because operational GHG emissions may not achieve carbon neutrality by 2045 in accordance with the Mayor's Commission on Climate Change, impacts related to threshold "b" are considered potentially significant. Impacts and mitigation measures will be further evaluated in the EIR.

Mitigation Measures:

To be determined in EIR.

3.9 Hazards and Hazardous Materials

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	[ ]	[ ]	[X]	[ ]
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	[ ]	[X]	[ ]	[ ]
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	[ ]	[X]	[ ]	[ ]
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	[ ]	[X]	[ ]	[ ]
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?	[ ]	[ ]	[ ]	[X]
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	[ ]	[X]	[ ]	[ ]

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	[ ]	[ ]	[ ]	[X]

Discussion

a) Less than Significant Impact

Construction machinery (i.e. cranes, trucks, and excavators) would be used throughout construction to drill, excavate, grate, install pipelines, construct buildings, and backfill and seal wells to be destroyed. This equipment may leak small amounts of petroleum products (i.e. gasoline and diesel) and automotive fluids during transportation, equipment use, and storage. Additionally, other chemicals (i.e. paints, adhesives, and solvents) would be required during construction. Each proposed well site would also include a well pump, chlorine disinfection equipment, and fluoridation equipment. Chemicals for disinfection would be housed in a separate room within the control building at each proposed well site. Chlorine gas, sodium chloride salts for on-site generation of sodium hypochlorite, or liquid sodium hypochlorite for chlorine disinfection and liquid or powdered/granular fluoride for fluoridation would be delivered to each proposed well site approximately once a month. The City would register a hazardous materials business plan with Sacramento County EMD for all stored chemical quantities exceeding County outlined minimums for solids, liquids, and gases. Standard operating procedures would be developed for the delivery and dosing of chemicals at the proposed well sites with annual review and training of procedures. In the event chlorine gas is used at any proposed well sites, the City will follow all City and other local, state, and federal procedures for the safe transport, use, and storage of chlorine gas. Therefore, there would be no waste stream resulting from treatment byproducts.

To minimize the risk of exposure to hazardous materials from routine use or accident conditions, federal, state, and local regulations have been put in place to regulate hazardous material use, storage, transportation, and handling. The City of Sacramento is required to comply with all applicable federal, state, and local regulations pertaining to hazardous materials (Federal Code Title 40 and 49; Occupational Safety and Health Administration [OSHA] 29 CFR 1910; California code section 5001, 5401, 5701, and 25507; California Health and Safety Code Division 20, Chapter 6.5, Article 6.5, Article 6.6, and Article 13; and City of Sacramento Code Title 8 Health and Safety, Chapter 8.64 Hazardous Materials Disclosure). Conformance with the above regulations would include implementation of a SWPPP to control contaminants in storm water discharges (including construction-related hazardous materials) through appropriate BMPs. While specific BMPs would be determined during SWPPP preparation based on site-specific characteristics (e.g. equipment types), BMPs would include standard industry measures and guidelines contained in the NPDES Construction General Permit and industry standard BMP handbooks. Conformance with federal hazardous materials transportation law (49 U.S.C 5101 et seq.) and California Health and Safety Code Division 20, Chapter 6.5, Article 6.5 would require precautionary measures be taken during the routine transport of hazardous materials, such as testing and preparation of a transportation safety plan. According to California Health and Safety Code Division 20, Chapter 6.5, Article 13, used oil that may be produced from construction or operation of the Project would be recycled. Handling of treatment chemicals at each well would be conducted in accordance with requirements of the California Accidental Release Prevention (CalARP) Program, which would ensure safe handling of all chemicals, including chlorine gas or sodium hypochlorite. Both chlorine gas and sodium hypochlorite are routinely used for disinfection at well sites across the City and standard measures for safe handling and use of chemicals would be implemented to ensure that operation of facilities would not create a hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials. With

compliance with existing regulations, impacts would be less than significant and no mitigation would be required.

b) Less than Significant with Mitigation Incorporated

Sensitive receptors surrounding the proposed well sites include schools, parks, residential communities, and commercial areas. **Mitigation Measure HAZ-1** would minimize the risk of hazardous material exposure through material use and accidents by requiring the City of Sacramento and its construction contractor(s) to develop a Hazardous Materials Management and Spill Prevention and Control Plan to ensure project-specific contingencies are in place. With the implementation of **Mitigation Measure HAZ-1**, the impacts from hazardous materials to the public or the environment from potential accidents during construction would be less than significant. During operation of the Project, there is low risk of an accidental chemical spill during transport or use of chemicals at the well facility. The Project would be required to comply with various existing regulations (see response to "a" above) that would minimize the risk of accidental hazardous material release during operations. In addition, a Hazard Materials Business Plan, Emergency Response Plan, and Risk Management Plan would need to be prepared and implemented based on the State of California Accidental Release Prevention (CalARP) requirements. The CalARP program incorporated and modified the Federal Risk Management Plan and designed it to minimize harm to people and the environment through enforcing regulations that minimize risks for facilities that handle hazardous materials. Safety measures would be put in place to ensure proper storage containers, safety labeling, materials needed to readily absorb spills, and training for site workers. Impacts of operation would be less than significant and mitigation would not be required.

c) Less than Significant with Mitigation Incorporated

There are existing schools located within one-quarter mile of the proposed well sites. During construction, there would be emissions of toxic air pollutants, such as diesel particulate matter, within one-quarter mile of schools. As explained in Section 3.3 Air Quality, emissions would be below SMAQMD localized significance thresholds (LSTs) and less than significant. As explained in response "b" above, there is a risk of accidental release of hazardous materials during project construction, including within one-quarter mile of schools. Implementation of **Mitigation Measure HAZ-1** would reduce impacts to less than significant. **Mitigation Measure HAZ-2** would reduce impacts of well construction and delivery of chemicals at proposed well locations located at schools by coordinating with schools to schedule construction activity during the summer when school is not in session and chemical deliveries before or after school hours.

During operation, each proposed well site would store chemicals and require transportation of hazardous chemicals to the facility once a month. Chlorine gas, which may be used for disinfection, is considered an extremely hazardous substance. As explained under responses "a" and "b" above, each proposed well site would be compliant with local, regional, state, and federal regulations; therefore, there would be less than significant impacts related to hazardous material release associated with long-term Project operation. For operation of pipelines, no hazardous materials would be handled or emitted on a regular basis. Impacts would be less than significant.

d) Less Than Significant Impact with Mitigation Incorporated

As described in the City of Sacramento *Groundwater Master Plan* (2017), the proposed well site locations were selected by targeting aquifers that have acceptable groundwater quality, thereby avoiding the need for treatment. Within the City's service area, the primary naturally occurring constituents of concern in the freshwater bearing aquifers include arsenic, manganese, and methane. Anthropogenic groundwater contamination is also a concern in the City's service area as a result of historical overlying land uses, such as those associated with military installations, dry cleaning operations, and chrome plating. Although wells

were sited to avoid known groundwater contaminant plumes, it is possible that well sites could be affected by surface contamination.

A Phase 1 Environmental Site Assessment would be developed as a part of pre-construction and surveying activities to determine if the proposed wells are sited on or near contaminated sites. **Mitigation Measure HAZ-3** would be implemented in the event that contamination is identified at the proposed well site. Either remediation would occur at the site or an alternative well site would be selected. Impacts would be less than significant with mitigation incorporated.

e) No Impact

There are four airports located within the City of Sacramento with adopted airport land use plans: Sacramento International Airport (SACOG 2013), McClellan Airport (formerly McClellan Air Force Base) (SACOG 1992), Mather Airport (formerly Mather Air Force Base) (SACOG 1997), and Sacramento Executive Airport (SACOG 1999). Within the Sacramento Executive Airport Influence Area, Well 2 is located within Approach-Departure Zone 1 and Well 3 is located in Overflight Zone (SACOG 2015). Wells 10, 27, and 32 are located between 60 and 65 Community Noise Level Equivalent contours near McClellan Airport (SACOG 2015). These proposed well sites are located in developed residential areas and would require occasional site visits by City staff, resulting in short-term airport noise exposure. However, the Project would not result in new residences near any airports nor would it create new long-term employment within those areas. Additionally, the Project would not include tall structures that could interfere with airport safety measures. Therefore, no impacts would occur related to safety hazards or excessive noise within an airport land use plan area.

f) Less than Significant with Mitigation Incorporated

The City of Sacramento *Emergency Operations Plan* (EOP) (2018) provides guidance for the City's response to extraordinary emergency situations associated with natural, man-made, and technological disasters. While the EOP is a preparedness document and is designed to be read, understood, and exercised prior to an emergency, EOPs should be viewed as living documents because communities change and integrating the needs of individuals with different access and functional needs is a dynamic process. The City of Sacramento Evacuation Plan for floods and other emergencies was developed as an annex to the City of Sacramento's EOP in 2008. The City of Sacramento Office of Emergency Management (SacOEM) coordinates communication, planning, preparedness, response, and recovery during all hazards affecting the City of Sacramento.

The Sacramento County *Local Hazard Mitigation Plan* (LHMP) (2016) is designed to guide hazard mitigation planning to better protect the people and property of the County and participating jurisdictions from the effects of natural disasters and hazard events. Components of the plan include hazard identification, asset inventory, risk analysis, loss estimation, and mitigation strategy to reduce the effects of hazards in the County.

During construction, temporary closures of roads could occur for installation of pipelines, which could conflict with an adopted emergency response plan or emergency evacuation plan, as described above. With the implementation of **Mitigation Measure TRA-1**, coordination with local emergency responders would be required regarding lane closures. During operation, the Project facilities would require regular visits for well maintenance as well as chemical delivery. These minimal operational activities would not interfere with an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant with incorporation of **Mitigation Measure TRA-1**.

g) No Impact

The proposed Project would not involve installation or maintenance of infrastructure that is typically associated with fire risk (see Section 3.20 Wildfire). Additionally, the proposed Project sites are not located within an area with wildfire hazard potential. Therefore, the proposed Project would have no impact associated with exposing people or structures to a significant risk of loss, injury, or death involving wildland fires.

Mitigation Measures:

To mitigate possible hazardous materials impacts of the Project, the City shall implement **Mitigation Measures TRA-1, HAZ-1** and **HAZ-2**. With these mitigation measures incorporated, the Project impacts would be less than significant.

TRA-1: Traffic Control Plan (see *Section 3.17*)

HAZ-1: Hazardous Materials Management and Spill Prevention and Control Plan. Before construction begins, the City of Sacramento shall prepare a Hazardous Materials Management Spill Prevention and Control Plan that includes a project-specific contingency plan for hazardous materials and water operations. The Plan will be applicable to construction activities and will establish policies and procedures according to applicable codes and regulations, including but not limited to the California Building and Fire Codes, and federal and OSHA regulations. The Plan will include, but is not limited to the following:

- A discussion of hazardous materials management, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas;
- Notification and documentation of procedures; and
- Spill control and countermeasures, including employee spill prevention/response training.

HAZ-2: Well Construction and Chemical Deliveries at Schools. The City will coordinate with school officials for proposed well sites located at schools to schedule well construction during the summer when school is not in session and schedule chemical deliveries before or after school hours.

HAZ-3: Phase 1 Environmental Site Assessment and Remediation. Before construction begins, a Phase 1 Environmental Site Assessment will be conducted for each proposed municipal well site to identify contaminated sites at or near each proposed well site that pose a hazard for construction or to the City's potable water supply. In the event that sources of contamination are found, a potential Well Site Remediation or Relocation Plan would be developed to determine if site remediation should take place or if the well location should be moved to a location that is not affected by previous contaminant releases. Remediation would be conducted in accordance with Federal and state requirements for remediation of soil and/or groundwater contamination.

3.10 Hydrology and Water Quality

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	[ ]	[ ]	[X]	[ ]
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	[X]	[ ]	[ ]	[ ]
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	[ ]	[ ]	[X]	[ ]
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	[ ]	[ ]	[X]	[ ]
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	[ ]	[ ]	[X]	[ ]
iv) impede or redirect flood flows?	[ ]	[ ]	[X]	[ ]
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	[ ]	[ ]	[X]	[ ]
e) Conflict with or obstruct implementation of a water quality control	[X]	[ ]	[ ]	[ ]

plan or sustainable groundwater management plan?

Discussion

Surface Water

The City of Sacramento is located at the confluence of the Sacramento and American Rivers in the southern portion of the Sacramento River Basin (City of Sacramento 2015). The Sacramento River forms the City's western boundary from Interstate 80 to south of the Pocket Area. The American River transects the City, flowing west to join the Sacramento River north of Highway 50. Eight small tributaries of the Sacramento River pass through and provide drainage for the City of Sacramento. These tributaries include Dry Creek, Magpie Creek, and Arcade Creek in the northern portion of the City, and Morrison Creek, Florin Creek, Elder Creek, Unionhouse Creek, and Laguna Creek in the southern portion of the City. These creeks, in addition to local surface water drainages such as Chicken Ranch and Strong Ranch sloughs form the major natural drainages within the City of Sacramento. Man-made drainage canals, such as the Natomas East Main Drainage Canal and the East, West, and Main Drainage Canals provide drainage for a large portion of the urbanized areas within the City that are not served by the combined sewer system or the City's sumps.

Over the course of the City's history, floods have been the most frequent and considerable natural hazard affecting the City's environment and economy (City of Sacramento 2015). High water levels along the Sacramento and American Rivers are a common occurrence in the winter and early spring months due to increased flow from storm runoff and snowmelt. An extensive system of dams, levees, overflow weirs, drainage pumping plants, and flood control bypass channels strategically located on the Sacramento and American Rivers has been established to protect the area from flooding. These facilities control floodwaters by regulating the amount of water passing through a particular reach of either river. The amount of water flowing through the levee system can be controlled from outside of the City of Sacramento by Folsom Dam on the American River and the reserve overflow area of the Yolo Bypass on the Sacramento River. The operation of Folsom Dam directly affects most of the water utilities on the American River system. The Sacramento Weir of the Sacramento River bypass system is the key structure protecting the City of Sacramento during high flows on the Sacramento River, diverting flows through the Sacramento Bypass into the Yolo Bypass for safe passage to the Sacramento-San Joaquin Delta.

Groundwater

The proposed Project sites overly the North American Subbasin (California Department of Water Resources [DWR] Basin Number 5-021.64) and South American Subbasin (DWR Basin Number 5-021.65) of the Sacramento Valley Groundwater Basin. The North American Subbasin is generally bounded to the north by the Bear River, the west by the Feather River, and south by the Sacramento River (DWR 2006). The eastern boundary represents the approximate edge of the alluvial basin. The South American Subbasin is bounded on the east by the Sierra Nevada, on the west by the Sacramento River, on the north by the American River, and on the south by the Cosumnes and Mokelumne Rivers (DWR 2004). The Sacramento Groundwater Authority Groundwater Management Plan (GMP) (2008) covers the portion of the North American Subbasin within Sacramento County and the Central Sacramento County Groundwater Management Plan (SCWA 2006) covers the South American Subbasin. The Sacramento Groundwater Authority and Sacramento Central Groundwater Authority developed annual Basin Management Reports for their respective GMPs through 2014, when the Sustainable Groundwater Management Act (SGMA) was passed).

Both the North American Subbasin and South American Subbasin are designated by DWR as high priority basins and are subject to the provisions of SGMA. **Table 3-9** lists the Groundwater Sustainability Agencies

(GSAs) within the North American Subbasin and South American Subbasin, respectively, with the GSAs governing the proposed Project sites in bold. The GSAs in the North American Subbasin and South American Subbasin are required to develop Groundwater Sustainability Plans for their respective subbasins to be submitted to DWR by January 2022. The GSPs will document basin conditions before and after the enactment of SGMA (January 1, 2015). Basin management as part of the GSP will be based on measurable objectives, interim milestones, and minimum thresholds defined to prevent significant and unreasonable impacts on the sustainability indicators defined by SGMA.

Table 3-9: Groundwater Sustainability Agencies in the North American and South American Subbasins

North American Subbasin GSAs	South American Subbasin GSAs
• Reclamation District No. 1001 • **Sacramento Groundwater Authority** • South Sutter Water District • County of Sutter – Sutter • West Placer • County of Sutter – North American	• County of Sacramento GSA – South American Subbasin • Omochumne-Hartnell Water District • **Sacramento Central Groundwater Authority** • Franklin Drainage District • Reclamation District No. 1002 • Reclamation District No. 2110 • Reclamation District No. 369 • Reclamation District No. 744 • Reclamation District No. 755 • Reclamation District No. 813 • Reclamation District No. 551 • Sloughhouse Resource Conservation District

The Central Valley Regional Water Quality Control Board (RWQCB) designates beneficial uses for surface water bodies and groundwater. Unless otherwise designated by the Central Valley RWQCB, all groundwater in the Region is considered to be suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND) and industrial process supply (PRO) (CV-RWQCB 2018).

The City has historically relied on groundwater to meet 15 to 20 percent of its water supply demands, making groundwater an important component of the City's water supply portfolio. Currently, the City has 22 active municipal wells permitted by the State Water Resources Control Board Division of Drinking Water (DDW) in the North American Subbasin and two (2) active municipal wells in the South American Subbasin permitted by DDW. Additionally, the City has four (4) active municipal wells permitted by DDW that are currently offline in the North American Subbasin and three (3) municipal wells pending permitting by DDW in the South American Subbasin.

Groundwater quality is generally considered good throughout the North American and South American subbasins. Currently, five of the City's municipal wells (Wells 92, 111, 127, 144 and 154) are offline due to water quality concerns. Wells 92 and 11 are not permitted by DDW . While Well 92 currently meets all DDW drinking water requirements, the well has tested positive for coliform bacteria after conducting airlift development and disinfection to remove the presence of bacteria in 2016. Water produced from Well 111 has had elevated concentrations of iron, manganese, and turbidity, periodically over their respective Maximum Contaminant Levels (MCLs). Well 111 is close to the El Monte perchloroethylene (PCE) contamination plume though PCE has not been detected in the raw water. Iron has been reported above the DDW MCL in Well 127 in 1993 and 1995, coupled with elevated turbidity levels; however, Well 127 has

met DDW drinking water standards for all other regulated constituents. Groundwater produced from Well 144 meets all DDW drinking water requirements. The City has removed this well from service due to the recent presence of PCE in March 2016, though the PCE concentration measured was below the DDW MCL of 5 µg/L. In Well 154, hexavalent chromium is very close to the revoked MCL of 10 µg/L (California Water Boards, 2018).

a) Less than Significant Impact

Each of the proposed well sites is estimated to include a construction area of over one acre, and therefore the project would be required to obtain coverage under the NPDES Stormwater Construction General Permit during construction. Additionally, areas within the public rights-of-way would also be disturbed during construction in order to connect each of the proposed wells to the potable water distribution system and sanitary sewer system. In accordance with the Construction General Permit, the City would be required to prepare a SWPPP, which would identify BMPs to control sediment and other construction-related pollutants in stormwater discharges. Typical BMPs include housekeeping practices such as proper waste disposal, covering stockpiles with tarps, containment of building materials, and inspection of construction vehicles to prevent leaks or spills. Contractors would be required to comply with the Construction General Permit throughout construction. Construction dewatering and well test water would either be discharged to land in accordance with RWQCB Waste Discharge Requirements for construction dewatering; or discharged to the local storm drain system per Sacramento Area Flood Control Agency (SAFCA) requirements; or discharged to the City of Sacramento sanitary sewer system. Compliance with these permits, including the implementation of BMPs would ensure the project would not violate water quality standards or waste discharge requirements, nor significantly degrade surface water quality. Impacts on surface water quality would be less than significant.

Operation of the proposed Project would consist of extracting groundwater from up to 20 wells in the North American Subbasin and up to 18 wells in the South American Subbasin. The extracted groundwater would be treated at each well site and conveyed for distribution in the City of Sacramento's potable water system. The proposed well sites are located away from any known groundwater contamination plumes and extraction of groundwater from the proposed well sites is not anticipated to result in the migration of contaminants. Existing wells to be destroyed would be abandoned in accordance with applicable standards, which would ensure that abandoned wells do not provide a conduit for contamination that would affect groundwater quality. No adverse impacts on groundwater quality would be expected.

b) Potentially Significant Impact

The proposed Project would extract groundwater from up to 20 wells in the North American Subbasin and up to 18 wells in the South American Subbasin for municipal use within the City of Sacramento, which is a designated beneficial use of groundwater as defined by the Central Valley Region Water Quality Control Plan (Basin Plan) (CV-RWQCB 2018). SGMA requires that groundwater basins be managed in a sustainable manner within 20 years of GSP adoption. GSPs for the North American Subbasin and South American Subbasin are currently under development. The City of Sacramento would coordinate with GSAs in the North American Subbasin and South American Subbasin throughout development of the proposed Project and the subbasins' respective GSPs to ensure the Project is consistent with the sustainability goals identified in the GSPs and does not inhibit either subbasin from reaching and maintaining sustainable conditions according to the SGMA regulatory timeframe. Groundwater extracted as part of the Project would be used to increase water supply resiliency for the City of Sacramento. The Project would comply with the sustainable yield of 131,000 AFY established for the North American Subbasin within Sacramento County and 273,000 AFY established for the South American Subbasin as part of the 2000 Water Forum Agreement (Sacramento Water Forum 2000).

Within the portion of the North American Subbasin underlying Sacramento County, between 2013 and 2015, total groundwater extraction was estimated to be between 85,994 AF in 2015 and 102,577 AF in 2013 (Sacramento Groundwater Authority 2016). Within the South American Subbasin, between 2005 and 2015, groundwater production ranged from 202,379 AF in 2011 to 256,954 AF in 2008 (Sacramento Central Groundwater Authority 2016). During the driest years, up to 38,000 AFY would be pumped from the North American Subbasin and 43,000 AFY would be pumped from the South American Subbasin (approximately 81,000 AFY in total) (City of Sacramento 2017). In the North American Subbasin, groundwater extraction by the City would decrease by approximately 3,500 AFY during the driest years, with pumping shifting to the South American Subbasin, and increase by as much as 5,300 AFY during normal years, compared to current conditions. Groundwater extraction by the City would increase by as much as 31,000 AFY during the driest years in the South American Subbasin compared to current conditions, potentially resulting in groundwater pumping above the sustainable yield of the South American Subbasin. Therefore, the Project may result in potentially significant impacts.

Further evaluation is needed to determine Project-related impacts to groundwater conditions in the North American and South American subbasins relative to sustainable conditions as established in their respective GSPs.

c) Less than Significant Impact

All potential well sites are currently sited on parcels covered by bare dirt; grass, trees, or other landscaping; or paved with asphalt or cement. The water distribution system and sanitary sewer pipeline connections would be constructed in existing roadways and would not increase total impervious surface area. Project construction may result in disturbance or exposure of soil that could be subjected to erosion and sedimentation during a rain event. However, implementation of the BMPs as required by the NPDES Stormwater Construction General Permit and SWPPP would limit erosion and sedimentation. The proposed wells would replace existing pervious services with pavement and control buildings that would lead to slightly increased surface runoff from sites. The impervious extraction well footprints would be minimal and would have a negligible effect on surface runoff.

Project facilities would have relatively minor above ground surface profiles that mostly consist of a 70 by 30-foot or 50 by 20-foot control building that is sited to blend in with existing buildings or located as to not interfere with current land uses. The proposed well sites would be entirely unoccupied other than occasional short-term visits by City of Sacramento well maintenance staff. As a result, the proposed Project facilities would not impede or redirect flood flows. The Project would not cause substantial erosion, substantially increase surface runoff, generate runoff in excess of the existing storm drainage systems, be a source of polluted runoff, or impede or redirect flood flows. Therefore, the proposed Project would have a less than significant impact.

d) Less than Significant Impact

The City of Sacramento is not within an area subject to tsunami (a large ocean wave caused by earthquakes or major ground movement) or seiche (a large wave generated in an enclosed body of water such as a lake, which is also typically caused by an earthquake) (City of Sacramento 2015). Therefore, no impacts related to tsunami or seiche are expected to occur within the Project area.

According to the 2035 City of Sacramento General Plan Environmental Impact Report (2015), the entirety of the City of Sacramento falls within the 100-year to 500-year flood zone. The majority of the City of Sacramento also lies within the 200-year floodplain (City of Sacramento 2015). All flood control facilities are designed, constructed, and maintained according to established standards for safety by regional, state, and/or federal agencies. The City cooperates with Sacramento County for emergency preparedness planning

and has adopted the Sacramento County Local Hazard Mitigation Plan. Due to extensive flood control infrastructure and planning by the City and County, it is assumed that flood hazard and risk of inundation of the Project sites would be low. Risk of pollutant release in the event of heavy rains or flooding is considered to be low, as groundwater is assumed to meet all drinking water standards with only chlorine and fluoride treatment required at each well site. Chemical quantities stored at each well site would be safely contained to prevent release (See discussion in *Section 3.9*) and are not considered to pose a health hazard in the event of inundation. Therefore, the impact would be less than significant.

e) Potentially Significant Impact

The Central Valley Basin Plan sets water quality objectives for the Project area. Water quality thresholds in the Basin Plan are identified to reduce pollutant discharge and ensure that water bodies are of sufficient quality to meet their designated beneficial uses. The Project would not conflict with the water quality standards outlined in the Basin Plan or worsen water quality conditions in any 303(d)-listed water body. Pollutant discharge during construction would be avoided via compliance with the Construction General Permit and SWPPP and NPDES permits for construction dewatering and well test water discharges. Once operational, the Project would extract groundwater, which would be conveyed for use in the City of Sacramento's service area or sold to wholesale customers. The Project would not discharge extracted water. The Project would not be a source of pollutants to downstream water bodies. Therefore, the proposed Project would not conflict with the Basin Plan.

As previously mentioned, the Sacramento Groundwater Authority GMP (2008) and Central Sacramento County GMP (2006) were developed to manage groundwater resources within the Sacramento County portion of the North American Subbasin and South American Subbasin, respectively. With the passage of SGMA in 2014, GMPs cannot be updated and are superseded by GSPs once they have been adopted by the local GSAs. The GSAs within the North American Subbasin and South American Subbasin, identified in **Table 3-9,** are responsible for the development and implementation of GSPs in their respective groundwater subbasins. The GSPs will establish sustainability goals and thresholds for the groundwater subbasins. However, no goals or thresholds have been established to date. Therefore, the proposed Project would not conflict with the GSPs. As mentioned under Item b, the sustainable yield for the Sacramento County portion of the North American Subbasin and South American Subbasin were established by the 2000 Water Forum Agreement as 131,000 AFY and 273,000 AFY, respectively (Sacramento Water Forum 2000). Groundwater pumping volumes estimated as part of the City of Sacramento Groundwater Master Plan (2017) indicate that increased pumping as a result of the Project could result in groundwater pumping above the sustainable yield in the South American Subbasin due to shifting future groundwater pumping by the City from the North American Subbasin to the South American Subbasin. Further evaluation is needed to determine Project-related impacts to groundwater conditions in the North American and South American Subbasins. Therefore, the Project may result in potentially significant impacts.

Mitigation Measures: To be determined in EIR.

3.11 Land Use and Planning

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Physically divide an established community?	[ ]	[ ]	[ ]	[X]
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	[ ]	[ ]	[ ]	[X]

Discussion

The proposed project is located in the City of Sacramento. Land use in the City is governed by the zoning designations established in the General Plan and municipal ordinances that outline acceptable uses in each zone. Pipelines would be constructed in existing roadway rights-of-way. Municipal wells that serve the City of Sacramento are allowed throughout the entire City regardless of zoning designation. According to the California Government Code Section 53091(d) and (e), building and zoning ordinances of a county or city do not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water.

a) No Impact

The proposed Project facilities would be constructed within established communities. The pipelines would be constructed in existing roadway rights of way and would not affect existing land use. All of the well sites currently consist of vacant, disturbed land or public parks with landscaped open space. The wells would have minimal permanent footprints and would not create a physical barrier in existing communities. The sites would be accessible by existing public roadways and would not develop new roads that would divide an established community. The proposed Project would have no impact related to physically dividing an established community.

b) No Impact

Municipal wells to serve the City of Sacramento are allowed throughout the City regardless of zoning designation. Therefore, no conflict with zoning for the proposed Project would occur.

Mitigation Measures: None required or recommended.

3.12 Mineral Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	[ ]	[ ]	[ ]	[X]
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	[ ]	[ ]	[ ]	[X]

Discussion

Historical mining production for the City of Sacramento and the surrounding region has included construction aggregate (sand and gravel), common clay, kaolin clay, gold, and pumice (City of Sacramento, 2015). Currently, mineral resources extracted in Sacramento County are primarily construction sand and gravel (City of Sacramento, 2015). Based on the Surface Mining and Reclamation Act (SMARA) and the Mineral Resource Zones (MRZs) classifications, the City of Sacramento includes zones classified as MRZ-1, MRZ-2, MRZ-3, and MRZ-5. MRZ-1 are areas where that is little to no likelihood for presence of significant mineral resources based on geologic information. MRZ-2 are areas where the likelihood for occurrence of significant mineral deposits is high and these mineral resources tend to be economically beneficial. MRZ-3 areas have undetermined mineral resource significance that may be favorable environments for the occurrence of specific mineral deposits. MRZ-5 areas have been exhausted of mineral resources.

Based on the City of Sacramento's 2035 General Plan (2015), the majority of the central and southeastern portions of the City of Sacramento are MRZ-3 while the western and northern portions of the City are primarily MRZ-1. The City of Sacramento is classified as MRZ-2 surrounding the vicinity of Power Inn Road towards Bradshaw Road and beyond. The MRZ-2 area west of the Union Pacific Railroad is urbanized which limits access to mineral deposits. Portions of the MRZ-2 area east of the railroad are less urbanized and where most of the current and former mining operations are located. The MRZ-5 area is located within the MRZ-2 area, south of SR 16, where historical mining operations occurred. There are no MRZ-4 areas within the City of Sacramento.

a, b) No Impact

The majority of the proposed well site locations are founding within MRZ-1 and MRZ-3 areas. There are approximately 6 potential well sites that are located within the MRZ-2 and MRZ-5 areas, 15 sites within MRZ-3 areas, with the remaining located in MRZ-1 areas. The proposed wells would occupy very minimal space within each site and would not result in loss of locally-important or state or regionally valued mineral resources. Construction of the proposed Project would approximately disrupt up to 48,960 square feet per site temporarily (based on the well activity area and construction staging area). Operation of the proposed

Project would result in approximately 14,400 to 43,560 square feet of area being reserved for the well. The proposed Project footprint would be minimal and thus would not impact the availability of minerals in the area. Therefore, the proposed replacement wells would have no impact on mineral resource availability.

Mitigation Measures: None required or recommended.

3.13 Noise

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	[X]	[ ]	[ ]	[ ]
b) Generation of excessive groundborne vibration or groundborne noise levels?	[ ]	[ ]	[X]	[ ]
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	[ ]	[ ]	[ ]	[X]

Discussion

a) Potentially Significant Impact

The City of Sacramento Municipal Code, Chapter 8.68, contains the following applicable noise regulations within city limits.

Exterior Noise Standards

The following noise standards shall apply to all agricultural and residential properties: From seven a.m. to ten p.m. the exterior noise standard shall be fifty-five (55) dBA. From ten p.m. to seven a.m. the exterior noise standard shall be fifty (50) dBA.

It is unlawful for any person at any location to create any noise which causes the noise levels when measured on agricultural or residential property to exceed for the duration of time set forth following, the specified exterior noise standards in any one hour by:

Cumulative Duration of the Intrusive Sound	Allowance Decibels
Cumulative period of 30 minutes per hour	0
Cumulative period of 15 minutes per hour	+5
Cumulative period of 5 minutes per hour	+10
Cumulative period of 1 minute per hour	+15
Level not to be exceeded for any time per hour	+20

Each of the noise limits specified in the table above shall be reduced by five dBA for impulsive or simple tone noises, or for noises consisting of speech or music.

If the ambient noise level exceeds that permitted by any of the first four noise limit categories specified in the table above, the allowable noise limit shall be increased in five dBA increments in each category to encompass the ambient noise level. If the ambient noise level exceeds the fifth noise level category, the maximum ambient noise level shall be the noise limit for that category.

Exemptions

The following activities shall be exempted from the provisions of this chapter:

Any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work;

Noise sources due to the erection (including excavation), demolition, alteration or repair of any building or structure between the hours of seven a.m. and six p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between nine a.m. and six p.m. on Sunday; provided, however, that the operation of an internal combustion engine shall not be exempt pursuant to this subsection if such engine is not equipped with suitable exhaust and intake silencers which are in good working order. The director of building inspections may permit work to be done during the hours not exempted by this subsection in the case of urgent necessity and in the interest of public health and welfare for a period not to exceed three days. Application for this exemption may be made in conjunction with the application for the work permit or during progress of the work.

Temporary Construction Noise Impacts

Construction of each well would last up to 12 months (six to eight months for active construction) and would involve noise-generating activities such as excavation, well drilling, and installation of facilities. A description of the construction equipment that would be used for construction can be found in *Section 2.4.4*. The typical noise levels of construction equipment that would be used for the Project are shown in **Table 3-10**. Noise levels are presented in units of decibels (dB).[5]

[5] Decibels (dB) are calculated by comparing sound pressure to a sound pressure reference (the threshold of human hearing) and are measured using a logarithmic scale. A-weighted decibels are expressed as dBA or dB(A).

Table 3-10: Typical Construction Equipment Noise Levels

Equipment	Typical Noise Levels (dBA, at 50 feet)
Air Compressor	78
Auger Drill Rig	84
Backhoe/Loader	78
Concrete Mixer Truck	79
Concrete Pump Truck	81
Concrete Saw	90
Crane	81
Dozer	82
Drilling Rig Truck	79
Generator	81
Paver	77
Pick-up Trucks	75
Pump	81
Roller	80
Sweeper	82
Utility Truck	74[1]
Water Truck	84[1]
Welder	74

Source: FHWA 2006a
1. Water truck noise was assumed to be comparable to a tractor. Utility truck noise was assumed to be comparable to a flat-bed truck.

The extraction wells would be constructed in multiple phases. Most construction phases (site preparation, mobilization/demobilization, well testing, well equipping, well demolition, and landscaping and paving) would occur during daytime hours. The test well drilling and production well drilling and construction phases would require continuous, 24-hour operation of the drill rig and support vehicles in order to prevent borehole collapse. The test well drilling phase, at sites where it is necessary, would last four weeks. The production well drilling and construction phase would last up to five weeks. The construction equipment that would operate on a continuous, 24-hour basis during a well drilling phase is presented in **Table 3-11**.

Table 3-11: Drilling Phase Typical Construction Equipment Noise Levels

Equipment	Number	Typical Noise Levels (dBA, at 50 feet)
Air Compressor	1	78
Auger Drill Rig	1	84
Utility Truck	4	74[1]
Pump	1	81
Welder	1	74

Source: FHWA 2006a
1. Water truck noise was assumed to be comparable to a tractor. Utility truck noise as assumed to be comparable to a flat-bed truck.

In addition to activities at each well site, during Project construction, truck trips would generate noise along haul routes. Project construction would require up to 18 round-trip worker trips per day, up to 12 vendor trips per day, and up to 28 round-trip hauling trips per day. Noise-sensitive land uses located along haul routes, including residences and schools, would be exposed to truck noise during construction. The amount of noise generated is affected by the vehicle speed, load, road condition, and other factors. Truck trip noise would occur during daytime hours when ambient vehicle noise levels from vehicle traffic are already

elevated in the City. The City of Sacramento General Plan (City of Sacramento 2015), found that the largest source of noise is generated by vehicle traffic on freeways and surface streets.

Noise dissipates with distance and with attenuation features, such as barriers or terrain. Noise that emanates from a point source generally decreases at a rate of 6 dB per doubling of distance, while noise that emanates from a line source – a source that is created by multiple point sources moving in one direction; for example, a continuous stream of roadway traffic – decreases at a rate of 3 dB per doubling of distance (FTA 2018).

The proposed well sites are located near residences, schools, and other noise sensitive land uses that would be exposed to elevated noise levels during well construction. In particular, 24-hour construction work has the potential to disturb residents adjacent to the well sites. As a representation of the greatest noise impacts, this analysis focuses on Well 32, which would be drilled to a depth of 1,000 feet and therefore require 24-hour drilling for up to the full five weeks. Well 32 would be sited approximately 50 feet from the nearest residences on Los Robles Boulevard. Existing attenuation features at the site are minimal: the ground surface is a mixture of paved and unpaved surfaces; there is no wall or noise barrier between the nearest residence and the location of the proposed well and control building.

Construction noise that occurs during evening and nighttime hours, when ambient noise levels are generally quieter, would be perceived as more impactful. Nighttime construction work associated with well drilling has the potential to create a significant noise impact on nearby residences. Residential land use would be sensitive to construction noise during nighttime hours because it could be disruptive to sleep. Construction noise during the well drilling phase was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM). It was assumed that all of the equipment in **Table 3-11** would be operating simultaneously. With no noise shielding, the estimated maximum noise level, L_{MAX}, at a distance of 50 feet is 84.4 dBA. The estimated equivalent sound level (L_{EQ}), which is a measure of a receiver's cumulative noise exposure over a specified period of time, is 82.8 dBA. With no noise shielding, the noise levels would not reach the exterior daytime noise standard of 55 dBA until a distance of 1,500 feet away and would not reach the nighttime noise standard of 50 dBA until a distance of 2,000 feet away.

Exposing residents to this level of noise over an extended timeframe would constitute a significant impact. In order to mitigate this impact, the City shall require that its contractor implement **Mitigation Measure NOI-1**, which requires that sound barriers providing at least 25 dBA of noise attenuation be used during well drilling and nighttime construction activities. With the use of all feasible sound barriers, the noise from well drilling activities would be reduced to 57.8 dBA L_{EQ} at a distance of 50 feet (as calculated using RCNM), which is close to what the City considers acceptable exterior nighttime noise levels for residential land uses (50 dBA). With shielding, the noise levels would drop below 50 dBA at a distance of 150 feet. Even with mitigation, the impacts of nighttime construction work associated with drilling would be potentially significant because there are residences less than 50 feet from the construction area.

The other phases of well construction (site preparation, mobilization/demobilization, well testing, well equipping, well demolition, and landscaping and paving), as well as construction worker, vendor, and hauling truck trips, would occur during daytime hours, which would expose receptors at the well sites and along transportation routes to elevated noise levels. Due to the proximity of construction activities to residences and other noise-sensitive land uses, impacts from construction noise would be potentially disruptive to daily activities. These impacts would be lessened in part with implementation of **Mitigation Measure AIR-4**, which would require phasing of construction, and thus reduce the number of worker vehicle, and hauling trips that would be mobilized at a single time. In addition, **Mitigation Measure NOI-2** requires the construction contractor to implement BMPs for noise control. According to the City of Sacramento Municipal Code (8.68.080 Exemptions), temporary construction noise that occurs between seven a.m. and six p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between

nine a.m. and six p.m. on Sunday is exempt from noise standards, as long as construction equipment engines are equipped with suitable exhaust and intake silencers which are in good working order. Therefore, with implementation of **Mitigation Measure NOI-2**, daytime construction noise impacts would be less than significant.

Long-term Operational Noise Impact

Operation of the wells would require 24-hour pumping, which would generate noise. To provide noise attenuation, all large equipment (including the well and potable water booster pumps and emergency generator) would be housed within a concrete masonry unit (CMU) building, which would provide approximately 10 dB(A) of attenuation. In addition, a 6-foot tall CMU wall would surround each well house, and wells would be sited at least 50 feet from the nearest adjacent land use. With shielding from the CMU well house and 6-foot CMU wall, as well as attenuation due to distance, noise from operation of the well facilities would be less than significant.

Ongoing operation and maintenance for the wells would involve monthly inspections. Long-term noise associated with these minor additional vehicle trips would not result in a noticeable increase in permanent ambient noise above existing levels. With the environmental commitments and project design features, operational noise from the proposed facilities would be less than significant.

b) Less than significant impact

Construction activities associated with the proposed Project would have the potential to generate low levels of groundborne vibration. Groundborne vibrations propagate through the ground and decrease in intensity quickly as they move away from the source. Vibrations with a peak particle velocity (PPV) of 0.2 inches/second or greater have the potential to cause architectural damage to normal dwelling houses (City of Sacramento 2015).

The *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) provides average source levels for typical construction equipment that may generate groundborne vibrations; vibration source levels for construction equipment associated with the proposed Project are summarized in **Table 3-12**. None of the construction equipment to be used would exceed the PPV threshold of 0.2 inches/second at a distance of 25 feet.

Table 3-12: Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (inches/second)
Air Compressor	N/A
Auger Drill Rig	0.089[1]
Backhoe/Loader	N/A
Concrete Mixer Truck	0.076[1]
Concrete Pump Truck	0.076[1]
Concrete Saw	N/A
Crane	N/A
Dozer	0.089
Drilling Rig Truck	0.089[1]
Generator	N/A
Paver	N/A
Pick-up Trucks	0.076[1]
Pump	N/A
Roller (static)	0.089[1]

Equipment	PPV at 25 feet (inches/second)
Sweeper	N/A
Utility Truck	0.076[1]
Water Truck	0.076[1]
Welder	N/A

Source: FTA 2018
Most construction equipment is not expected to generate vibration; these are denoted with "N/A."
1. Drill rig PPV was assumed to be comparable to caisson drilling. Pickup trucks, utility trucks, water trucks, and concrete trucks were assumed to be comparable to "loaded trucks" and a static roller was assumed to be comparable to a large bulldozer as listed in the *Transit Noise and Vibration Impact Assessment Manual.*

Construction would not involve high-impact activities, such as piledriving, blasting, or vibratory rolling, that typically generate high levels of groundborne vibration. Sensitive receptors are located at least 50 feet from the noise source, which is farther than the PPV reference distance presented in **Table 3-12**. Impacts would be less than significant.

c) No impact

There are four airports located within the City of Sacramento with adopted airport land use plans: Sacramento International Airport (SACOG 2013), McClellan Airport (formerly McClellan Air Force Base) (SACOG 1992), Mather Airport (formerly Mather Air Force Base) (SACOG 1997), and Sacramento Executive Airport (SACOG 1999). Within the Sacramento Executive Airport Influence Area, Well 2 is located within Approach-Departure Zone 1 and Well 3 is located in Overflight Zone (SACOG 2015). Wells 10, 27, and 32 are located between 60 and 65 Community Noise Level Equivalent contours near McClellan Airport (SACOG 2015). The proposed well sites are located in developed residential areas and would require occasional site visits by City staff, resulting in short-term airport noise exposure. However, the Project would not result in new residences near any airports nor would it create new long-term employment within those areas. Therefore, the Project would not expose residences or workers to excessive aircraft noise. There would be no impacts.

Mitigation Measures:

See **Mitigation Measure AIR-4**. In addition, to mitigate possible noise impacts of the Project, the City shall implement **Mitigation Measure NOI-1** and **Mitigation Measure NOI-2**. With these mitigation measures incorporated, the Project impacts would still be considered potentially significant.

NOI-1: Noise Barriers

The City shall require its contractor to install temporary construction noise barriers prior to the start of well construction activities. These barriers shall block the line of sight between the equipment and the noise-sensitive receptor(s) and shall provide a minimum of 25 dBA of noise attenuation. Due to the height of the drill rig, the noise barrier shall be at least 24 feet tall. The construction noise barrier shall be constructed of a material with a minimum weight of one pound per square foot with no gaps or perforations. It shall remain in place until conclusion of the nighttime construction activities. The Project plans and specifications shall include documentation from a noise consultant verifying the appropriate design details for an effective noise barrier.

NOI-2: Construction Noise Reduction Measures

The City shall require its contractor to implement the following actions relative to construction noise:

- The City shall conduct construction activities to between seven a.m. and six p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between nine a.m. and six p.m. on Sunday, in accordance with the City of Sacramento Municipal Code, Section 8.68.080, with the exception of specific well drilling and testing activities, which require 24-hour continuous work.
- Prior to construction, the City in coordination with the construction contractor, shall provide written notification to all properties within 1,000 feet of the construction site, informing occupants of the type and duration of construction activities. Notification materials shall identify a method to contact the City's program manager with noise concerns. Prior to construction commencement, the City program manager shall establish a noise complaint process to allow for resolution of noise problems. This process shall be clearly described in the notifications.
- Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., water tanks, roll-off dumpsters) shall be positioned between the noise source and sensitive receptors.
- Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible.
- Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).
- Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment, where feasible.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

3.14 Population and Housing

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for	[ ]	[ ]	[ ]	[X]

example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	[ ]	[ ]	[ ]	[X]

Discussion

In 2015, the City of Sacramento served an estimated retail population of 480,105 through a total of 135,380 connections and a wholesale population of 566,582, which includes population for the wholesale customer's entire service areas (City of Sacramento 2016). The City of Sacramento is estimated at 84 percent built out as of 2018 (CDOC 2018). As planned for in the City's 2015 Urban Water Management Plan, the City's retail service area population will increase to approximately 695,830 and 828,533 in wholesale customer's entire service areas in 2040 (City of Sacramento 2016).

a) No Impact

The proposed Project would not directly induce unplanned population growth. While new housing and business development (both planned and unplanned) is anticipated to occur within the City limits as well as the service area of the City's wholesale customers, the purpose of the Project would be to serve existing customers and future customers as part of planned growth through water supply resiliency.

The City has historically relied on groundwater to meet about 15 to 20 percent of its water demands, making groundwater an important component of the City's water supply portfolio (City of Sacramento 2017). The City receives surface water from both the Sacramento and American Rivers for the remainder of its supply needs. As part of a water rights settlement contract with the U.S. Bureau of Reclamation, the City has specified annual maximum diversion limits for both rivers individually and combined. The City is also a signatory of the 2000 Water Forum Agreement (WFA) under which the City agreed to limit its diversions from the American River during extremely dry years and periods when river flows are below criteria set by Judge Richard Hodge in a 1990 decision based on the *Environmental Defense Fund v. East Bay Municipal District* litigation (also known as Hodge Conditions). This agreement, however, has no effect on the total amount of water from the American River to which the City is entitled. The 2000 WFA also established a sustainable yield for the portion of the North American Subbasin in Sacramento County (locally referred to as the North Basin) of 131,000 AFY (Sacramento Water Forum 2000).

While the City is anticipated to have sufficient surface water entitlements to supply projected demands, greater ability to extract groundwater during dry and critically dry years (as well as prolonged periods of drought) would provide improved resiliency to the City's water supply portfolio in the event that surface water diversions require temporary or permanent reduction measures. The City's aging groundwater wells, with as many as 23 wells reaching the end of their useful lives by 2025, further inhibit utilization of groundwater resources into the future as climate change and regulatory measures are anticipating to impact surface water availability. The project thus would not induce substantial unplanned population growth either directly or indirectly but would instead contribute to water supply resilience.

b) No Impact

Construction and operation of all proposed Project features would occur within existing roadways, vacant lots, parks, or schools. The Project would not displace existing people or houses or require the construction of replacement housing. At wells sited at parks, the well sites would be accommodated in the existing, open

grassy spaces and would not displace people or housing. Similarly, at schools, the well sites would be accommodated in existing, open grassy spaces or paved areas and would not displace people or housing. For these reasons, no impact would occur.

Mitigation Measures: None required or recommended.

3.15 Public Services

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:	[ ]	[ ]	[X]	[ ]
i) Fire protection?	[ ]	[ ]	[X]	[ ]
ii) Police protection?	[ ]	[ ]	[ ]	[X]
iii) Schools?	[ ]	[ ]	[X]	[ ]
iv) Parks?	[ ]	[ ]	[X]	[ ]
v) Other public facilities?	[ ]	[ ]	[ ]	[X]

Discussion

Fire Protection

The Sacramento Fire Department (SFD) services the entire City of Sacramento and two contract areas of 47.1 square miles adjacent to the city boundary within unincorporated parts of the county (City of Sacramento, 2015). SFD 24 fire stations located throughout their entire service area and provide full-service fire department that is responsible for responding to and mitigating incidents involving fires, medical emergencies, hazardous materials, and technical and water rescue (City of Sacramento, 2015). SFD also provides support services such as fire prevention, public education, fire investigation, and domestic preparedness planning and response. Pacific Fruitridge and Natomas Fire Protection Districts are also contracted areas within SFD's jurisdiction. SFD's fire stations are strategically placed through the City of Sacramento to provide assistance to residents and businesses through the service area (City of Sacramento, 2015).

Two of the proposed well sites would be located at fire stations – Fire Station 19 (Well 34) and Fire Station 10 (Well 16). Both of these proposed wells were placed in areas that are not used at the station in order to avoid disturbance to the facility.

Police Protection

The Sacramento Police Department (SPD) provides police protection for the City of Sacramento and the County Sheriff's Department services areas outside of the city boundary. The California Highway Patrol, UC Davis Medical Center Police Department, and the Regional Transit Police Department also provide police protection within Sacramento city limits (City of Sacramento, 2015).

Schools

There are six school districts that provide elementary, middle, and high school education to City of Sacramento and its surrounding area residents. These school districts include Sacramento City Unified School District, Natomas Unified School District, Robla School District, Twin Rivers Unified School District, and Elk Grove Unified School District. There are 150 public schools and 57 private schools within the City of Sacramento (City of Sacramento, 2015).

Four of the proposed well site locations are on school property. Well 1 is proposed to be placed next to Success Academy's parking lot. Well 4 is proposed to be placed between Collis P Huntington Preschool and Airport Park along the southern edge. Well 10 is proposed to be located adjacent to South Avenue near the tennis courts of Grant Union and Grant West High Schools. Well 33 is proposed to be located between Rio Cazadero High School and Las Flores High School next to a parking lot.

Parks

The Sacramento Parks Department maintains approximately 3,178 acres of parkland and 222 parks, recreation areas, parkways, and open spaces (City of Sacramento, 2015). Several of the park facilities are owned or operated by other jurisdictions such as the County of Sacramento, State of California, and Sacramento City Unified School District (City of Sacramento, 2015). Of the 3,108 acres of parks, 1,573 acres are neighborhood and community parks and the remaining are city and non-city regional parks.

Twelve of the proposed well sites are located on existing parks throughout the City of Sacramento. These parks include William Chorley Park (Well 2), Tahoe Park (Well 4), Glenn Hall Park (Well 5), Glenbrook Park (Well 6), Granite Park (Well 7), Camellia Park (Well 8), Florin Reservoir Park (Well 9 & 36), Johnston Park (Well 17), Robertson Park (Well 22), Gardenland Park (Well 23), and Hagginwood Park (Well 27). The proposed wells within parks were strategically placed to be in areas that seem to not be used as much for recreational use (e.g. the edge of a park or near a parking lot or street) or near buildings or trees to blend into the surroundings.

Libraries

The Sacramento Public Library (SPL) is a joint powers agency between the cities of Sacramento, Citrus Heights, Elk Grove, Galt, Isleton, Rancho Cordova, and the County of Sacramento. SPL serves residents for each of these cities and county. SPL operates a total of 27 branches, including 11 branches within the City of Sacramento and 16 branches outside of the city boundary, and a bookmobile. Residents of Sacramento County have access to all library branches both inside and outside of the city boundary. There are also two other libraries that are operated by the State.

Hospitals

There are seven major private hospitals, no public hospitals, six of which provide emergency services.

a.i.) Less than Significant Impact

The Project has proposed the placement of two new groundwater extraction well locations at Fire Station 10 and 19 in Sacramento. At Fire Station 19, Well 34 would be placed along the southern border of the Fire Station's property line away from the actively used areas of the station. Well 16 would be placed along the northeastern property line of Fire Station 10 adjacent to the existing municipal water well; the area where the proposed well would be tucked away from the areas used by the station. The proposed well construction activity areas and construction staging areas were strategically placed in areas of the properties that would not block and substantially change the fire station facilities or their ability to use their facilities, including fire truck access to and from the fire house to the street. Fire protection requirements during construction and destruction of the Project would be short-term and demands would be filled by the existing local fire stations. Existing fire protection services provided by the Sacramento Fire Department would be sufficient to provide fire and other emergency responses to the proposed Project well sites. Additionally, the proposed Project would not directly or indirectly induce unplanned population growth that would require construction of new fire departments or expansion of fire protection facilities. There would also be no additional or increased fire protection facilities required to maintain response times, service ratios, or other measures of performance. Therefore, the proposed Project would have less than significant impact on fire protection services.

a.ii.) No Impact

The proposed Project would not construct new or physically alter police protection facilities, nor would it substantially change service ratios or response times for police services or stations. During construction of the proposed Project, existing police services provided by the City of Sacramento would be sufficient. The operation of the proposed Project would not directly or indirectly induce unplanned population growth that would require the construction of new or expansion of existing police stations to maintain service ratios, response ratios, or other measures of performance. Therefore, the proposed Project would have no impact to police services.

a.iii.) Less than Significant Impact

The Project has proposed the placement of four wells at different schools – Success Academy, Collis P Huntington Preschool, Grant Union/Grant West High School, and Rio Cazadero/Las Flores High School. The proposed wells would be placed in areas that do not adversely impact existing facilities. Instead the wells have been strategically placed adjacent to parking lots or near the property boundary of the school, which would allow student and faculty continued use of school facilities. Portions of the parking lots near the well construction activity area would potentially be used as a construction staging area, which would limit parking availability for the school. Otherwise, the proposed Project would not construct new or physically alter school facilities. Additionally, the proposed Project would not change existing demand on schools because the Project would serve existing and planned communities. Operation of the Project does not include housing, and operation would not result in new employment or population growth that would result in an influx of students. No new school facilities would need to be built in order to maintain class size ratios or other performance objectives. Therefore, impacts would be less than significant.

a.iv.) Less than Significant Impact

Twelve of the proposed well sites are located at parks. The proposed parks include William Chorley Park, Tahoe Park, Glenn Hall Park, Glenbrook Park, Granite Park, Camellia Park, Florin Reservoir Park, Johnston Park, Robertson Park, Gardenland Park, and Hagginwood Park. Each well site would have an average footprint of 150 feet by 150 feet when completed. Installation of a well at all of these park locations would occur within open, landscaped green spaces of the park and would not require the removal of any park facilities or equipment. A control building would be constructed to securely contain the well, above-grade piping, chemical and electrical rooms, and associated appurtenances. Impacts would result from temporary construction activities, which would adhere to the City of Sacramento's BMPs (see *Section 2.5 Environmental Commitments*). From the twelve proposed well sites, the Project would result in the replacement of up to approximately 172,800 square feet (4 acres) of open, landscaped public park area for the City of Sacramento or 14,400 square feet (0.33 acre) per proposed groundwater extraction well if the entire well activity area was used.

The dedicated green space at each park would decrease; however, the proposed wells are strategically placed in locations that would likely see less use. Most of the wells would be placed either by the park boundary, a parking lot, directly adjacent to a pool, or near other structures or groups of trees. Each well was placed to avoid disturbing park use and to blend it with other park facilities. Therefore, less than significant impact would occur. This impact is also addressed in *Section 3.16 Recreation*.

a.v.) No Impact

The proposed Project would not change existing demand on other public facilities because the Project would not directly or indirectly induce population or employment within the area. Construction and operation of the proposed Project would not require the expansion of existing or the construction of new public facilities such as hospitals or libraries. Therefore, no impact would occur to other public facilities.

Mitigation Measures: None required or recommended.

3.16 Recreation

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	[ ]	[ ]	[X]	[ ]

Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	[ ]	[ ]	[ ]	[X]

Discussion

The proposed Project does not include the development of new housing or employment opportunities that would increase use of existing recreation facilities. However, twelve of the proposed well site locations occur within existing parks. These parks include William Chorley Park (Well 2), Tahoe Park (Well 4), Glenn Hall Park (Well 5), Glenbrook Park (Well 6), Granite Park (Well 7), Camellia Park (Well 8), Florin Reservoir Park (Well 9 & 36), Johnston Park (Well 17), Robertson Park (Well 22), Gardenland Park (Well 23), and Hagginwood Park (Well 27). Information on City of Sacramento parks is described above in *Section 3.15*.

a) Less than Significant Impact

The proposed well footprint would occupy approximately 0.33 acres of green space area at each park. The proposed well sites would avoid impacting park features and facilities such as playground equipment, picnic benches, barbecues, baseball fields, and soccer fields. Construction would have a temporary impact on the access and use of the recreational facilities. Once construction is complete, the park facilities and uses would continue as before and the proposed Project would not result in permanent physical deterioration or alteration of the existing recreational facilities. Impacts from construction and operational activities would be minimized with the City of Sacramento BMPs (see *Section 2.7 Environmental Commitments*).

O&M activities would require chemical deliveries and intermittent well maintenance such as pump testing and maintenance, well capacity testing, or rehabilitation of the well during the life of the well. The O&M activities would be minimal and would not interfere with regular use of parks and their facilities.

The proposed Project would not reduce park service ratios nor permanently increase the use of parks and recreational facilities. Therefore, the proposed Project would have less than significant impact.

b) No Impact

The proposed Project would not require the construction or expansion of recreational facilities which could have an adverse physical impact on the environment. Therefore, no impact would occur.

Mitigation Measures: None required or recommended.

3.17 Transportation

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	[ ]	[ ]	[X]	[ ]
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	[ ]	[ ]	[X]	[ ]
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	[ ]	[X]	[ ]	[ ]
d) Result in inadequate emergency access?	[ ]	[X]	[ ]	[ ]

Discussion

City transportation policies encourage multimodal transportation and circulation, with an emphasis on walking, bicycling and transit. Policies encourage removal of barriers, improving connections to transit, and managing travel demand through reductions in commute trips and encouraging off-peak deliveries.

a) Less Than Significant

Project construction would generate small temporary increases in traffic to each well site, where well construction would result in worker trips and haul truck trips for materials and equipment needed for construction. Worker trips are estimated to range from about 4 to 30 trips per day depending on the stage of construction, with larger numbers during construction of pipelines and smaller crews during the finishing of building exteriors. Truck trips would be less than 10 truck trips per day, spread out through the day, for delivery of materials and equipment. Once constructed, each well would generate an average of about one trip per day, consisting of one to two trips per week for the well crew, on trip per week for a machinist and one trip per week for the electrical and instrumentation crew. Construction and operation of wells would thus have no material effect on pedestrians, bicyclists or transit and would not pose any conflicts with City policies.

b) Less Than Significant Impact

CEQA Guidelines section 15064.3, subdivision (a), provides that "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." During

construction, automobile and other passenger vehicle travel would consist of trips by construction workers commuting to the project site. As discussed above, construction worker trips would be a maximum of about 30 trips per day during the construction period for each well. Construction trips are temporary and would not contribute to long-term increases in VMT.

The proposed Project is not a land use or transportation project and would have very minimal and sporadic operational traffic. Operational travel would consist of daily maintenance trips and would require, on average, only one maintenance worker round trip per day for maintenance of the facilities. Operational VMT would thus be negligible.

According to the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Governor's Office of Planning and Research 2018). "projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact". On average, daily passenger vehicle trips during construction would be about 30 trips per day, and operation would require a maximum of one trip per day. Project construction and operation would not substantially increase VMT in the Project area and would thus not conflict with or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b). That provision embodies policies favoring the minimization of VMT as a means to reduce greenhouse gas emissions. Compared with typical land use and transportation projects, the proposed Project would have very limited VMT and thus limited GHG emissions associated with construction and operations.

c) Less Than Significant with Mitigation Incorporated

The Project does not include any changes in roadway design but would entail short periods of construction within roadways to construct pipeline connections between the proposed wells and existing water and sewer lines. Pipeline construction could require lane closures, which could present a hazard to traffic. To ensure safety of motor vehicles, bicycles and pedestrians during any construction that necessitates work in public roadways, the City would implement **Mitigation Measure TRA-1**, which requires preparation and implementation of a Traffic Control Plan. With implementation of the Traffic Control Plan, traffic hazards during construction would be less than significant.

d) Less Than Significant with Mitigation Incorporated

During construction of pipelines in roadways, there is a possibility that lane closures would interfere with emergency service vehicles. Implementation of **Mitigation Measure TRA-1** would ensure that access is maintained for emergency response traffic. Impacts to emergency access would thus be less than significant with mitigation.

Mitigation Measures:

To mitigate possible impacts to circulation and emergency access during construction, the City of Sacramento shall implement **Mitigation Measure TRA-1**. Project impacts would be less than significant with incorporation of mitigation.

TRA-1: Traffic Control Plan

Prior to Project construction, the City of Sacramento shall require its construction contractor to implement a Traffic Control Plan, to be approved by the construction inspector and the City Transportation Division. The Traffic Control Plan shall:

- Identify staging locations to be used during construction
- Identify safe ingress and egress points from staging areas
- Identify potential road closures
- Establish haul routes for construction-related vehicle traffic
- Identify alternative safe routes to maintain pedestrian and bicyclist safety during construction

The City's project manager shall coordinate with emergency services (police, fire, and others) to notify these entities regarding construction schedule, Project alignment and siting, and potential delays due to construction. The City shall identify roadways and access points for emergency services and minimize disruptions to or closures of these locations.

The Traffic Control Plan shall include provisions for traffic control measures including barricades, warning signs, cones, lights, and flag persons, to allow safe circulation of vehicle, bicycle, pedestrian, and emergency response traffic. The Traffic Control Plan shall be reviewed and approved by the City's project manager and the construction inspector prior to Project construction. The City's construction inspector shall also provide the construction schedule and Traffic Control Plan to the City Transportation Division for review to ensure that construction of the proposed Project does not conflict with other construction projects that may be occurring simultaneously in the Project vicinity.

3.18 Tribal Cultural Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of	[ ]	[X]	[ ]	[ ]

historical resources as defined in Public Resources Code section 5020.1(k), or				
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	[ ]	[X]	[ ]	[ ]

a) Less than Significant with Mitigation Incorporated

The proposed Project has the potential to affect tribal cultural resources. No specific archaeological resources were identified within the Project area. However, the Sacred lands search was positive, and identified tribal groups and/or individuals that are culturally affiliated within the proposed Project area. A list of tribal groups was provided from the Native American Heritage Commission and each tribe will be contacted. In order to minimize impacts to tribal cultural resources, **Mitigation Measure CUL-1a** through **1c** would be implemented to help preserve any discoveries.

Mitigation Measures: Refer to **Mitigation Measures** in *Section 3.5 Cultural Resources.*

3.19 Utilities and Service Systems

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	[ ]	[ ]	[X]	[ ]
b) Have sufficient water supplies available to serve the Project and	[ ]	[ ]	[ ]	[X]

	reasonably foreseeable future development during normal, dry and multiple dry years?				
c)	Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	[ ]	[ ]	[X]	[ ]
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	[ ]	[ ]	[X]	[ ]
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	[ ]	[ ]	[X]	[ ]

Discussion

a) Less than Significant

The proposed Project would construct up to 38 replacement municipal wells and associated facilities, pipelines connecting wells to the water distribution system, pipelines connecting wells to the sanitary sewer system, and destruction of up to 38 wells at or near the end of their useful life. As discussed under Population and Housing (*Section 3.14*), the proposed Project would serve existing and planned communities and would not induce unplanned population or employment growth that would require or result in the construction of new or expanded water, wastewater treatment, stormwater drainage, electrical power, natural gas, or telecommunications facilities. The proposed Project would replace up to 38 existing municipal production wells. Since the proposed Project would involve the replacement of existing wells and not result in a net addition of wells, capacities related to water, wastewater treatment, stormwater drainage, electrical power, natural gas, and telecommunications facilities would be available and would not result in the need of additional facilities beyond the well site and connection to the water and sanitary sewer systems.

The proposed wells would use up to 13,990,700 kWh/year (14 gigawatt hours [GWH]) per year of electricity, on average. In 2018, Sacramento Municipal Utility District (SMUD) customers used 10,297 GWh (CEC n.d.). The demands of the proposed Project would be relatively small compared to the overall capacity of SMUD. Therefore, the Project would not be expected to result in the need to construct new electrical facilities. The environmental impacts of the proposed Project's new water production and associated conveyance are addressed throughout this Initial Study and no additional mitigation is anticipated to be necessary to mitigate those impact to a less than significant level.

b) No Impact

The proposed Project involves replacement of up to 38 municipal production wells and associated water distribution system improvements to improve water supply resiliency for the City of Sacramento. Construction of the proposed well sites would require minimal water supply for the purpose of dust control

and concrete mixing. Operation of the proposed Project would continue to provide water supply for the City of Sacramento and would not induce unplanned population growth that would require or result in construction of new water treatment facilities or the expansion of existing facilities because the Project is not a development that would generate demand for water. Thus, no impact related to sufficient water supplies would occur.

c) Less than Significant Impact

The proposed Project would construct up to 38 municipal production wells as well as distribution infrastructure and connections to the sanitary sewer system. The proposed Project would not induce unplanned population growth that would result in or require expansion of existing wastewater collection or treatment services. The proposed Project would require disposal of raw groundwater pumped to waste during initial well start up or after the well has been idle or in standby mode. The volume of raw groundwater pumped to waste would be minor and result in a negligible temporary increase discharged to the sanitary sewer system, which is operated by the City of Sacramento. Therefore, impacts would be less than significant.

d) Less than Significant Impact

Construction of the proposed Project would generate soil and asphalt waste during installation of underground pipelines and installation of wells. While excavated soil would be reused on site as backfill to the extent feasible, small amounts of material would need to be disposed at a permitted landfill in accordance with local and state solid waste disposal requirements. There are two State regulations that set standards for solid waste generation: AB 939 mandates 50 percent diversion of solid waste; and AB 341 mandates recycling programs to help reduce GHG emissions. The Sacramento County Kiefer Landfill is the primary location for the disposal of waste by the City of Sacramento. As of 2012, 305 acres of the 600 acres contain waste. As a result, the Kiefer Landfill should be able to serve the area until the year 2065 (City of Sacramento 2015). Therefore, the existing landfill would have more than enough total permitted area to accommodate construction debris from the proposed Project. Excess construction debris is reasonably anticipated to be within the permitted capacity of the Kiefer Landfill after on-site backfill of excavated soil combined with adherence to mandatory construction waste diversion requirements.

Operation of the proposed Project is not anticipated to generate long-term solid waste. Therefore, solid waste generation would be limited to temporary construction activities and would not affect available solid waste disposal capacity in the region. Therefore, impacts related to local infrastructure capacity would be less than significant, and no mitigation would be required.

e) Less than Significant Impact

Construction and operation of the proposed Project would comply with local, state, and federal regulations related to solid waste. While operation of the proposed Project is not anticipated to generate a significant amount of long-term solid waste, construction activities would create debris such as excavated soil and asphalt as well as other waste materials and debris associated with destruction of existing wells. Excavated soil would be backfilled to the extent possible. Construction contractor(s) would be required to dispose of excess construction debris in accordance with existing reduction statutes (AB 939 and AB 341) and regulations. These regulations would determine the landfill to be used for disposal of construction debris, disposal of solid waste from operation of the well site water treatment systems, and mandatory 50 percent diversion of solid waste (AB 939), and mandatory recycling programs to reduce GHG emissions (AB 341). Therefore, impacts related to compliance with local, State, and federal reduction statues and regulations would be less than significant.

Mitigation Measures: No additional mitigation measures required or recommended.

3.20 Wildfire

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	[ ]	[ ]	[ ]	[X]
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	[ ]	[ ]	[ ]	[X]
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	[ ]	[ ]	[ ]	[X]
d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	[ ]	[ ]	[ ]	[X]

Discussion

The City of Sacramento is not located within a state responsibility area and has little to no risk to ecosystem health from wildfires (City of Sacramento, 2015). The City is a Local Responsibility Area and the entire City is designated as a non-very high fire hazard severity zone (non-VHFHSZ). Grass fires are an annual threat in unincorporated areas of Sacramento County, especially in area such as the American River Parkway; however, the City does not have forests or rangeland to burn (City of Sacramento, 2015). Sacramento is a developed city that has few remaining wildland areas. The closest fire hazard zone is over

10 miles away on the eastern side of the City boundary, which has been designated as a moderate fire hazard zone by the State of California (City of Sacramento, 2015).

a-d) No Impact

The proposed Project area is located throughout the City of Sacramento, which is a Local Responsibility Area and designated as non-VHFHSZ (FRAP, 2020 and Cal FIRE, 2019). Construction and operation thus would not occur in or near a state responsibility area or lands classified as very high fire hazard severity zones. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures required or recommended.

3.21 Mandatory Findings of Significance

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Does the Project:				
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	[ ]	[X]	[ ]	[ ]
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	[X]	[ ]	[ ]	[ ]
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	[X]	[ ]	[ ]	[ ]

Discussion

a) Less Than Significant with Mitigation Incorporated

With implementation of mitigation measures, impacts on fish, wildlife and historic resources would be avoided or reduced to less than significant.

b) Potentially Significant

Almost all of the project impacts would occur during construction, which would extend over a 15-year period. At this time, it is not known what other projects might overlap with construction that could occur 15 years in the future, so it is possible that construction of wells at some sites could result in cumulative construction impacts. With mitigation, most construction impacts at each well site would be less than significant and would not result in a cumulatively considerable contribution to construction impacts. However, noise from nighttime well drilling is a significant unavoidable impact that has the potential to be a significant cumulative impact if construction of well facilities overlaps with construction noise from other projects. The project has potentially significant long-term GHG emissions, which would, by definition, be considered a significant cumulative impact. The well replacement program would also have a potentially significant cumulative impact on groundwater resources associated with relocating wells from the North American Subbasin to the South American Subbasin. In addition to the proposed Project, other groundwater users such as the City of Elk Grove could have an impact on the South American Subbasin, which could result in a significant cumulative impact. Further evaluation of this groundwater impact is necessary to determine the potential effect of cumulative pumping.

c) Potentially Significant

The project would have short-term air quality, noise and traffic construction impacts that could temporarily impact humans. With implementation of mitigation measures, impacts on air quality and traffic would be less than significant. However, mitigation measures would not be sufficient to reduce the impacts of nighttime construction noise to less than significant.

Mitigation Measures: See **Mitigation Measures AES-1, AES-2, AIR-1, AIR-2, AIR-3, AIR-4, BIO-1, BIO-2a, BIO-2b, BIO-3, BIO-4, BIO-5a, BIO-5b, BIO-6, BIO-7a, BIO-7b, BIO-8, BIO-9, CUL-1a, CUL-1b, CUL-1c, GEO-1, HAZ-1, HAZ-2, NOI-1**, **NOI-2**, and **TRA-1**.

4. REPORT PREPARATION

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Natalie Cochran, Water Resources Planner
Melissa Stine, Water Resources Planner
Haley Johnson, Air Quality and Noise Specialist

WRA, Inc

Brian Freiermuth, Wildlife Biologist
Rhiannon Korhummel, Plant Biologist
Scott Yarger, Botanist

Basin Research Associates

Colin Busby, Ph.D., RPA, Archaeologist

Paleo Solutions, Inc.

Geraldine Aron, Paleontologist
Courtney Richards, Paleontologist

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APPENDIX A: DETAILED SITING OF NEW FACILITIES

Well 1
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 12.5 25 50
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 2
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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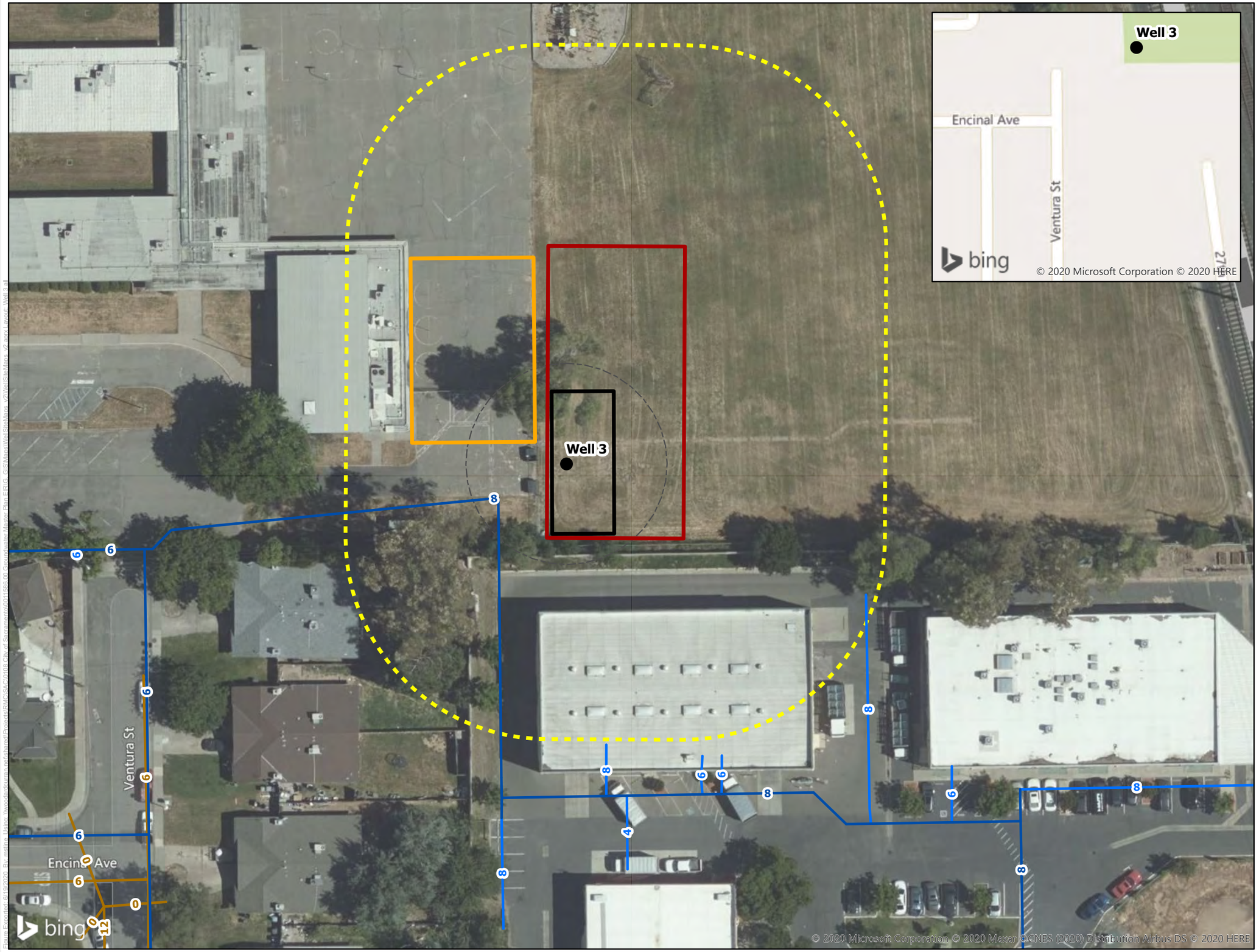

Well 3
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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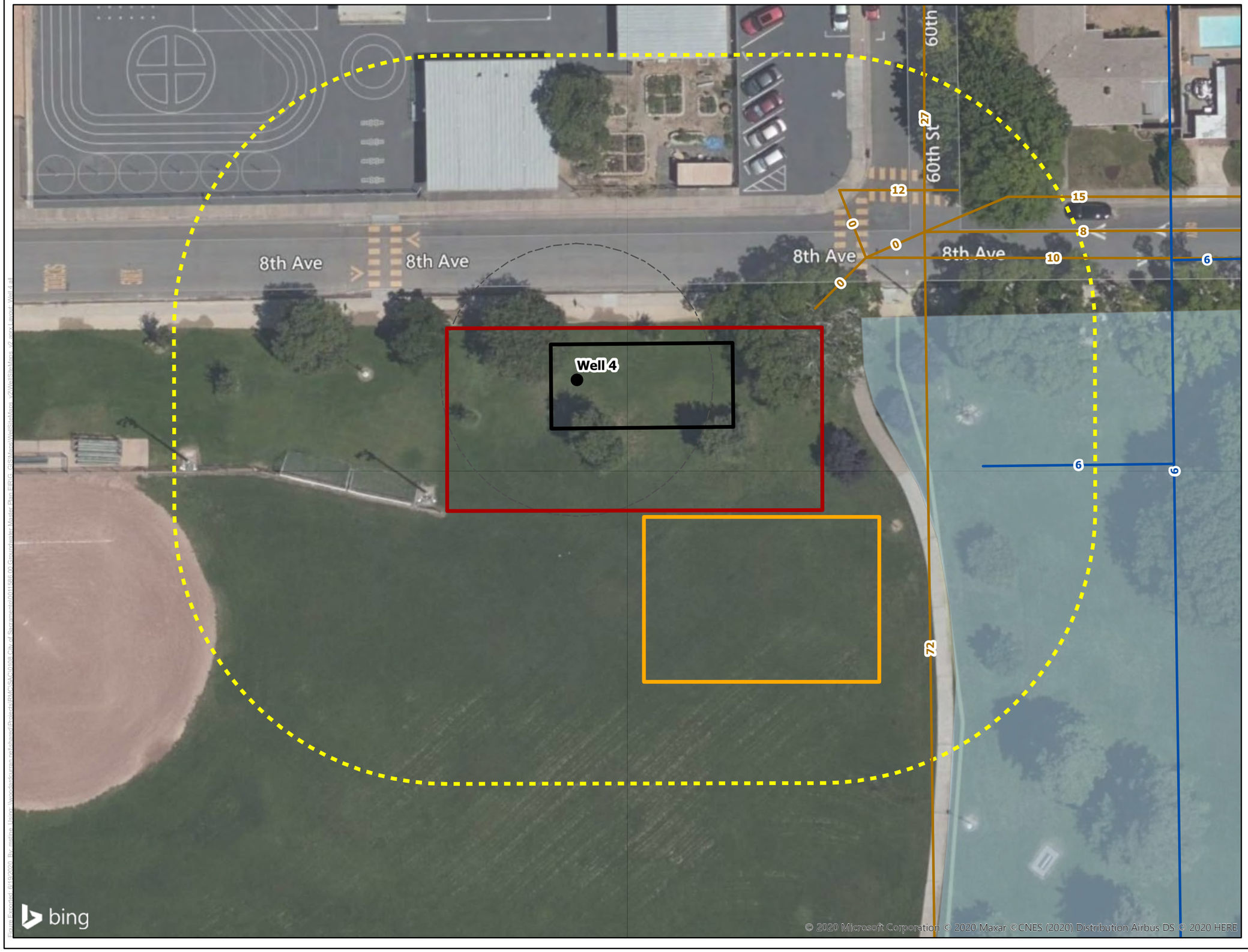
Well 4
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Sewer Main
- Detention Basin

0 10 20 40
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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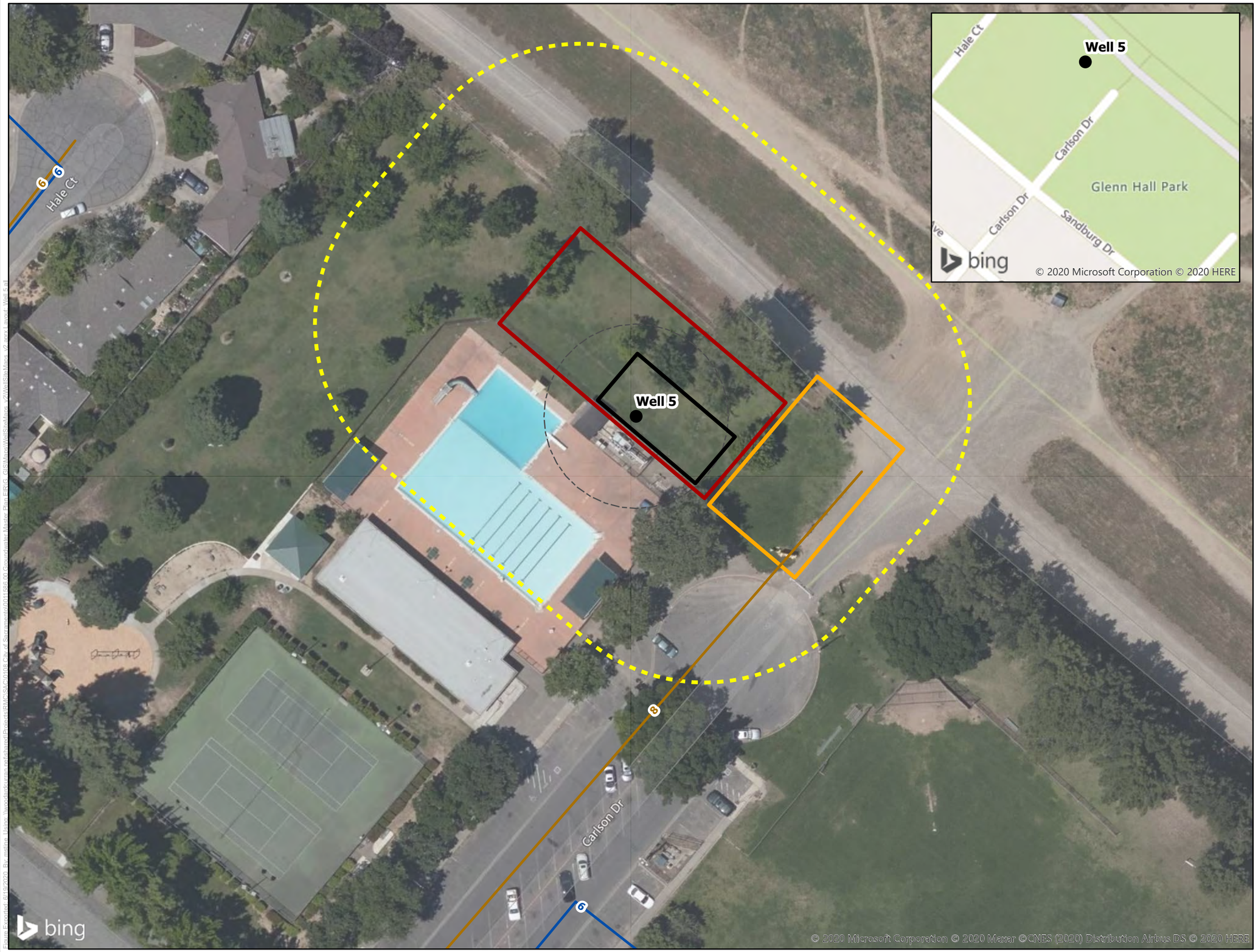
Plotted: 6/19/2020 By: mpina Date: \\woodardcurran.com\data\Projects\RMC\SAC\0011586.00 City of Sacramento\0011586.00 GIS\Mapping\Well Site Maps_2020\WellSiteMaps_2020.aprx\Layout_Well_4.pdf



Well 5
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 6
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 12.5 25 50 US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 7
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60 US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 8
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

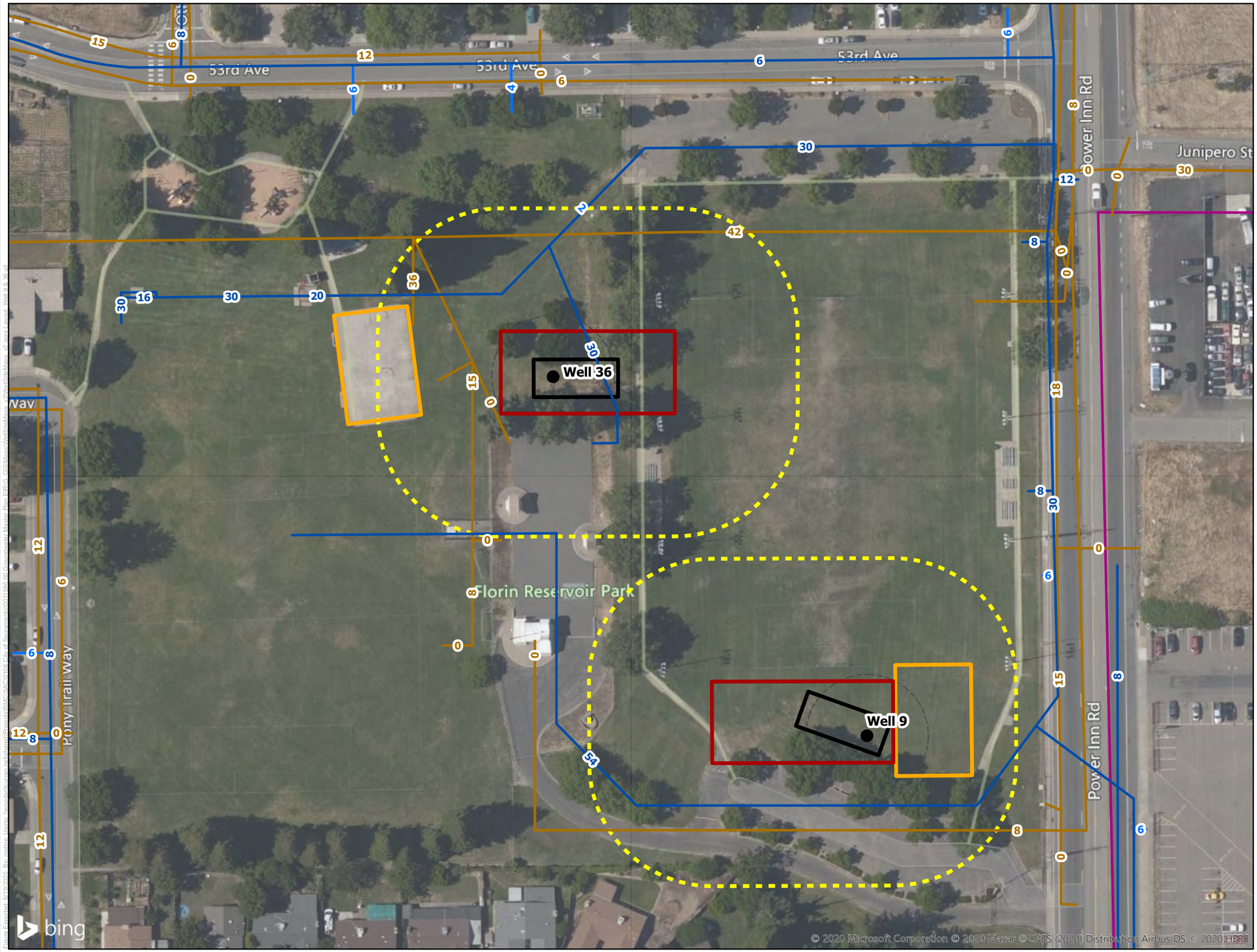
WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 9 & 36
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 10
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 11
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 12 & 37
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 13
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 14
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Existing Water Well
- Water Main
- Sewer Main
- Sewer Lateral Line

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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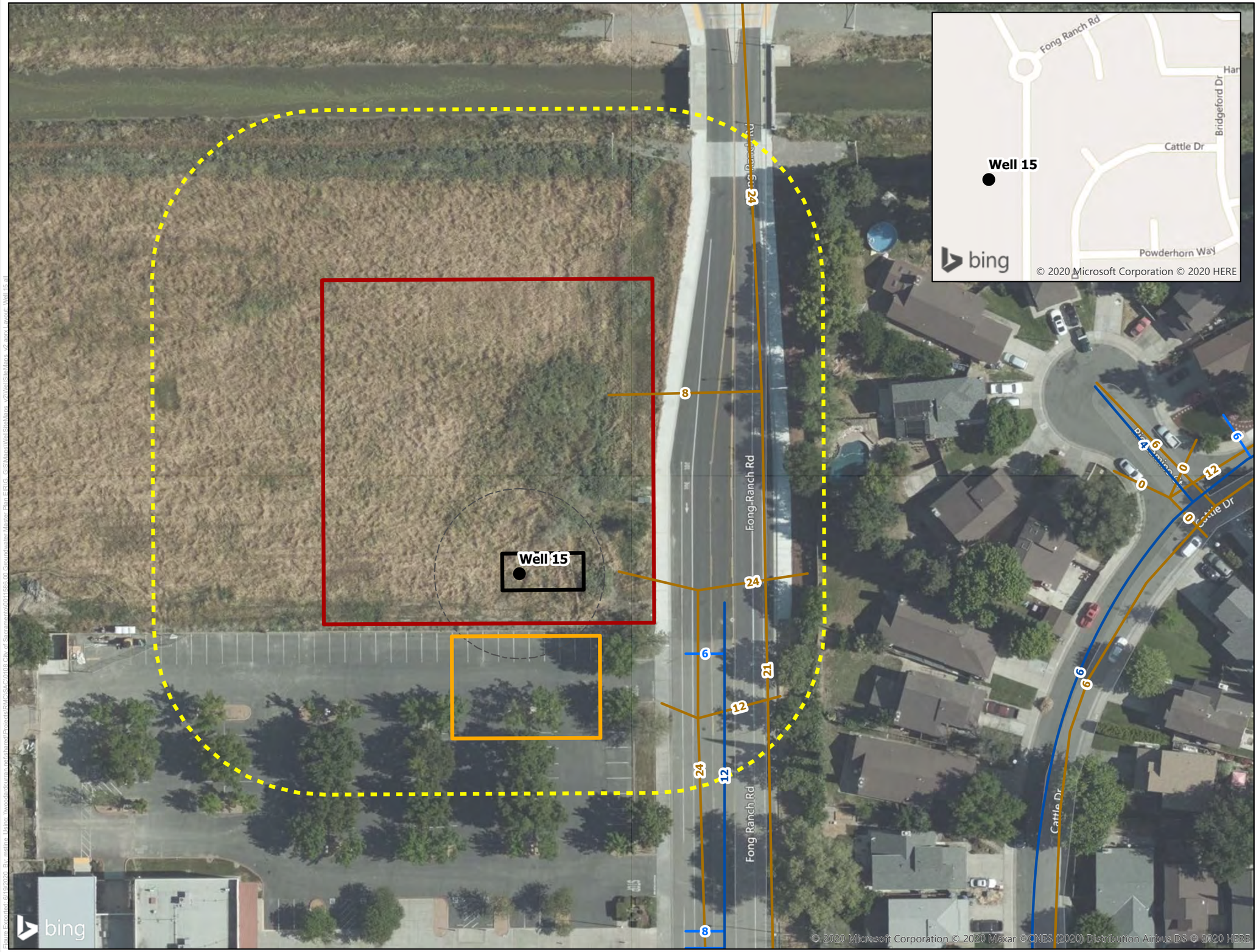
Well 15
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 16
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

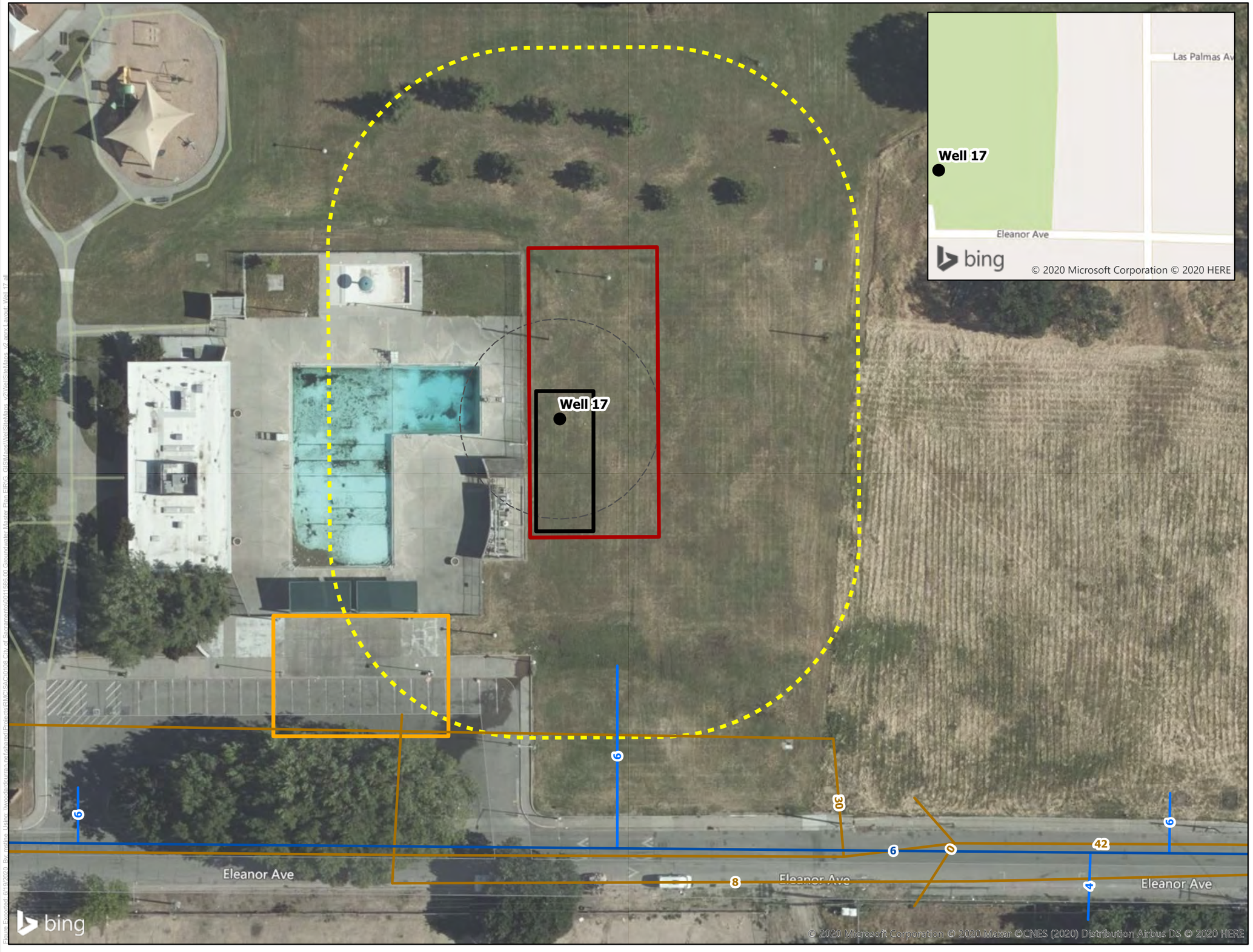
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 17
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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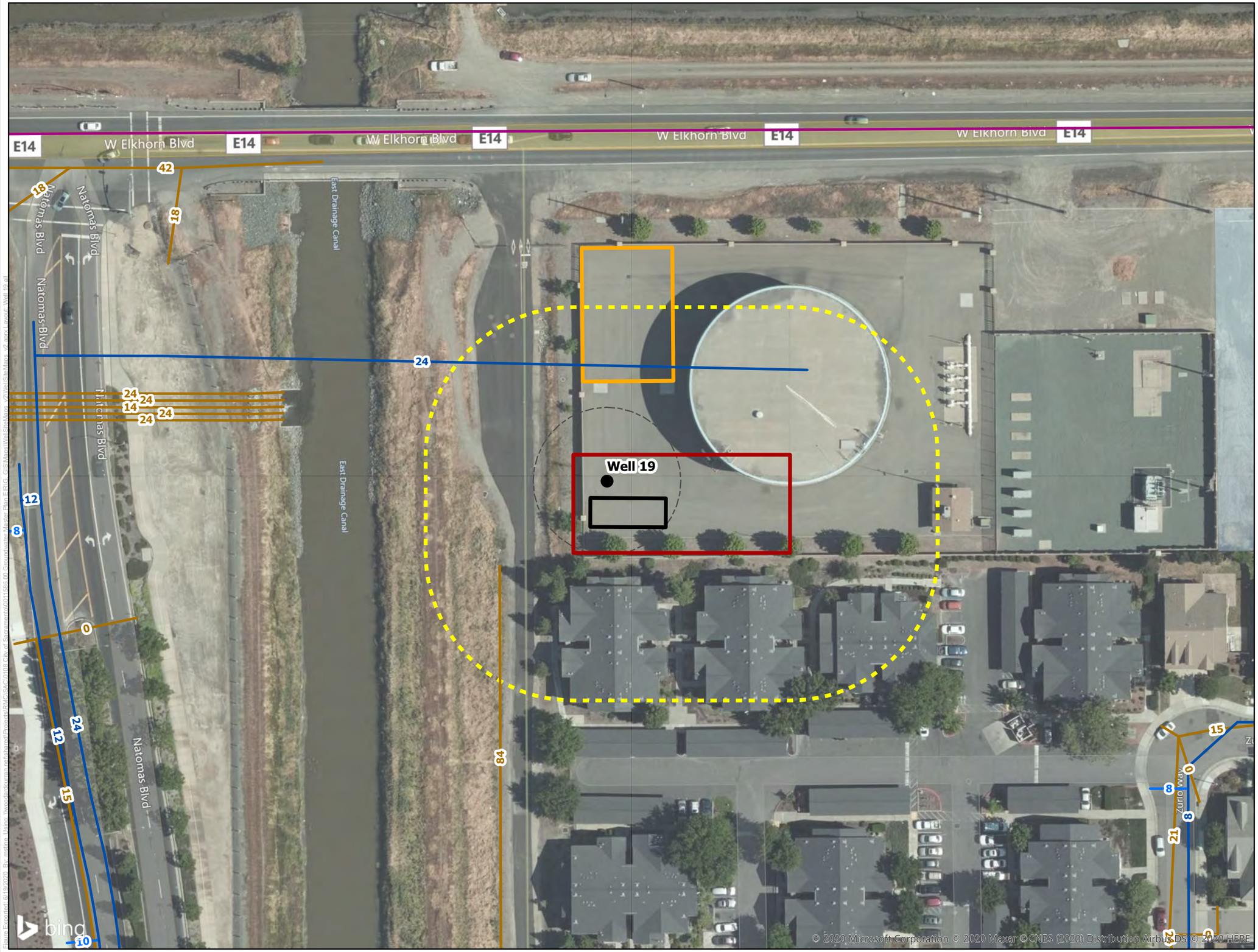
Well 19
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin
- City of Sacramento Boundary

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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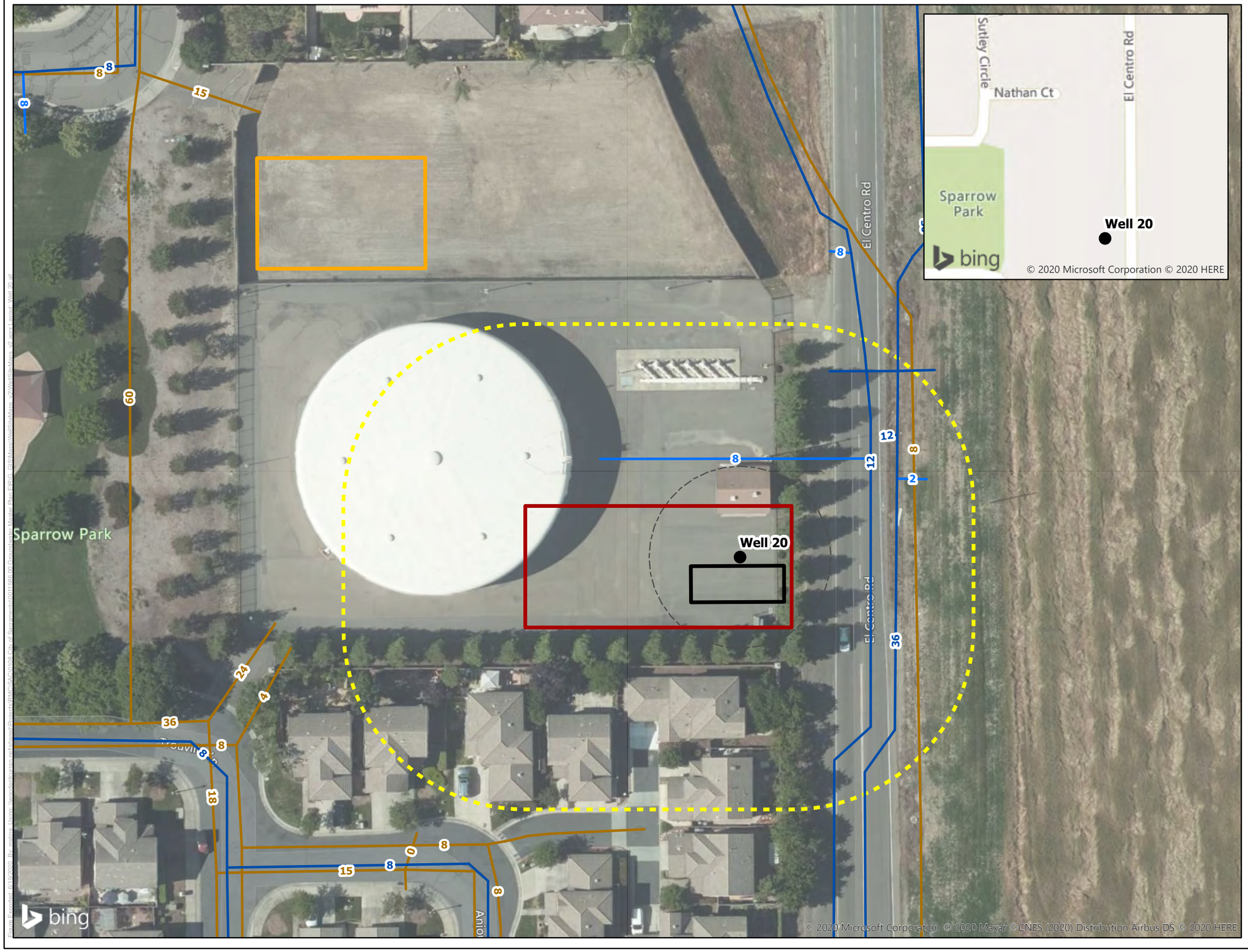
Well 20
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 21
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

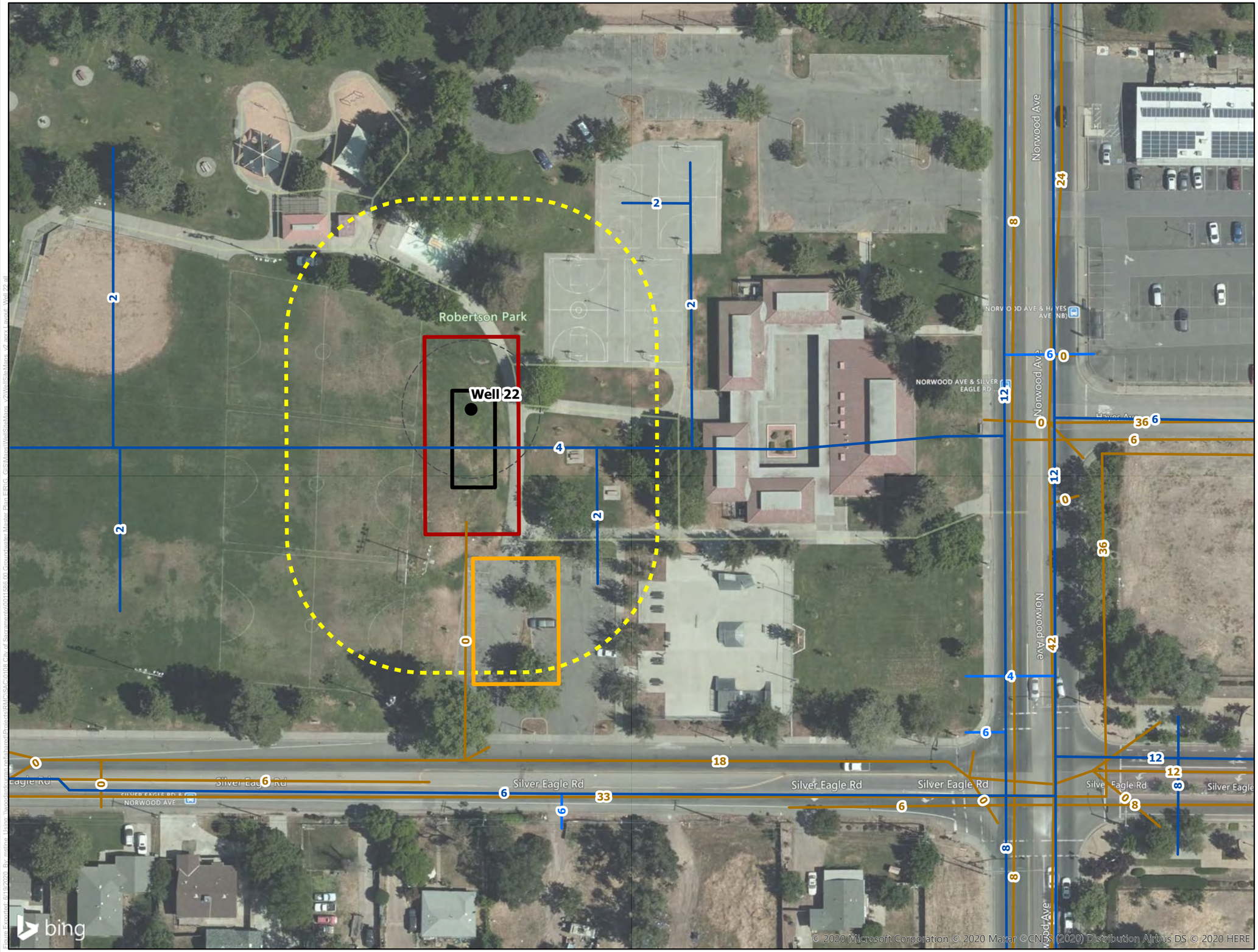
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 22
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 23
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 24
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 25
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 26
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 27
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 28
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 29
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 30
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 31
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

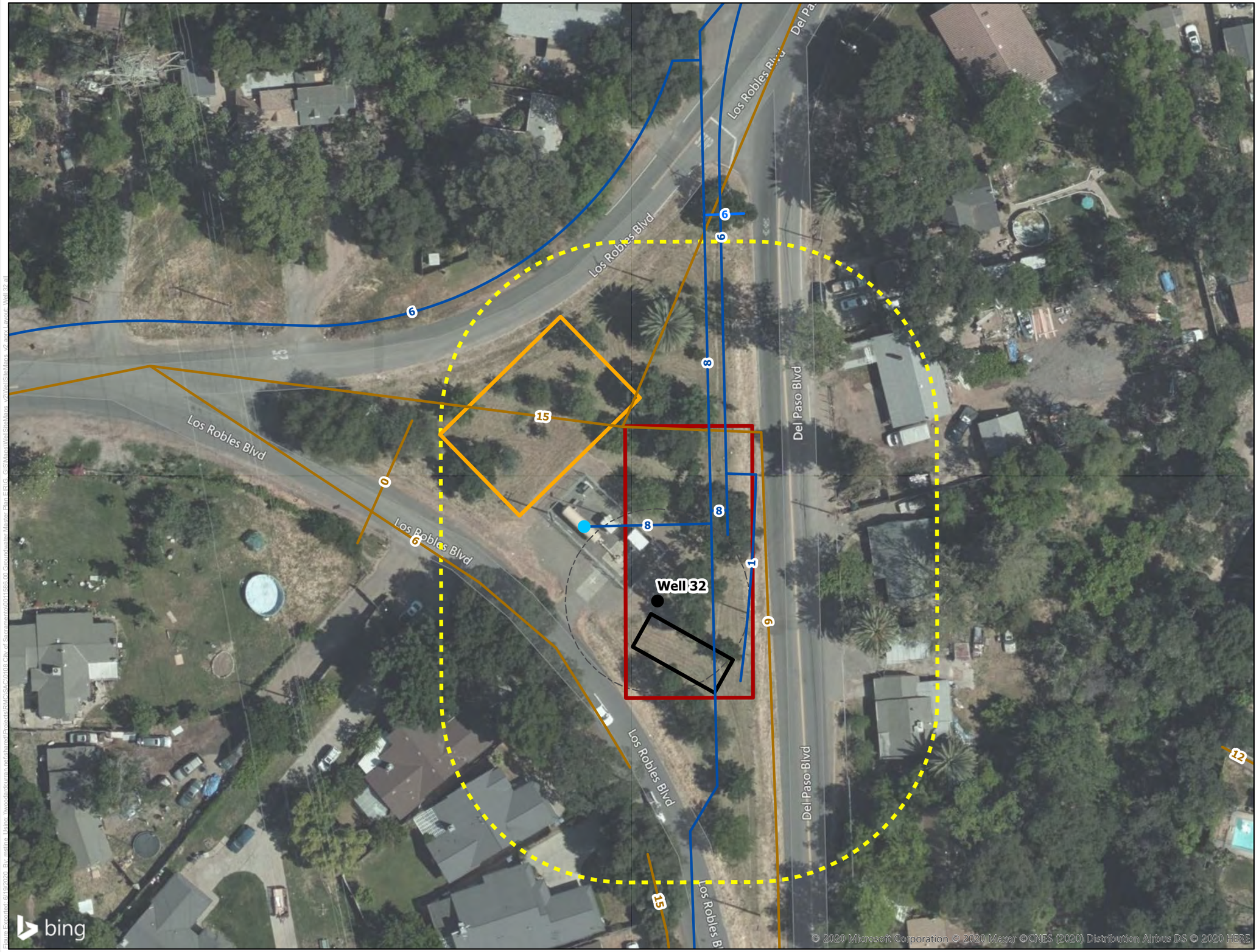
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 32
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

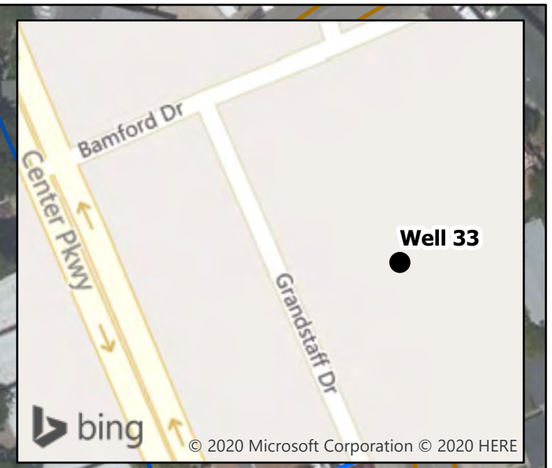
WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 33
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 34
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

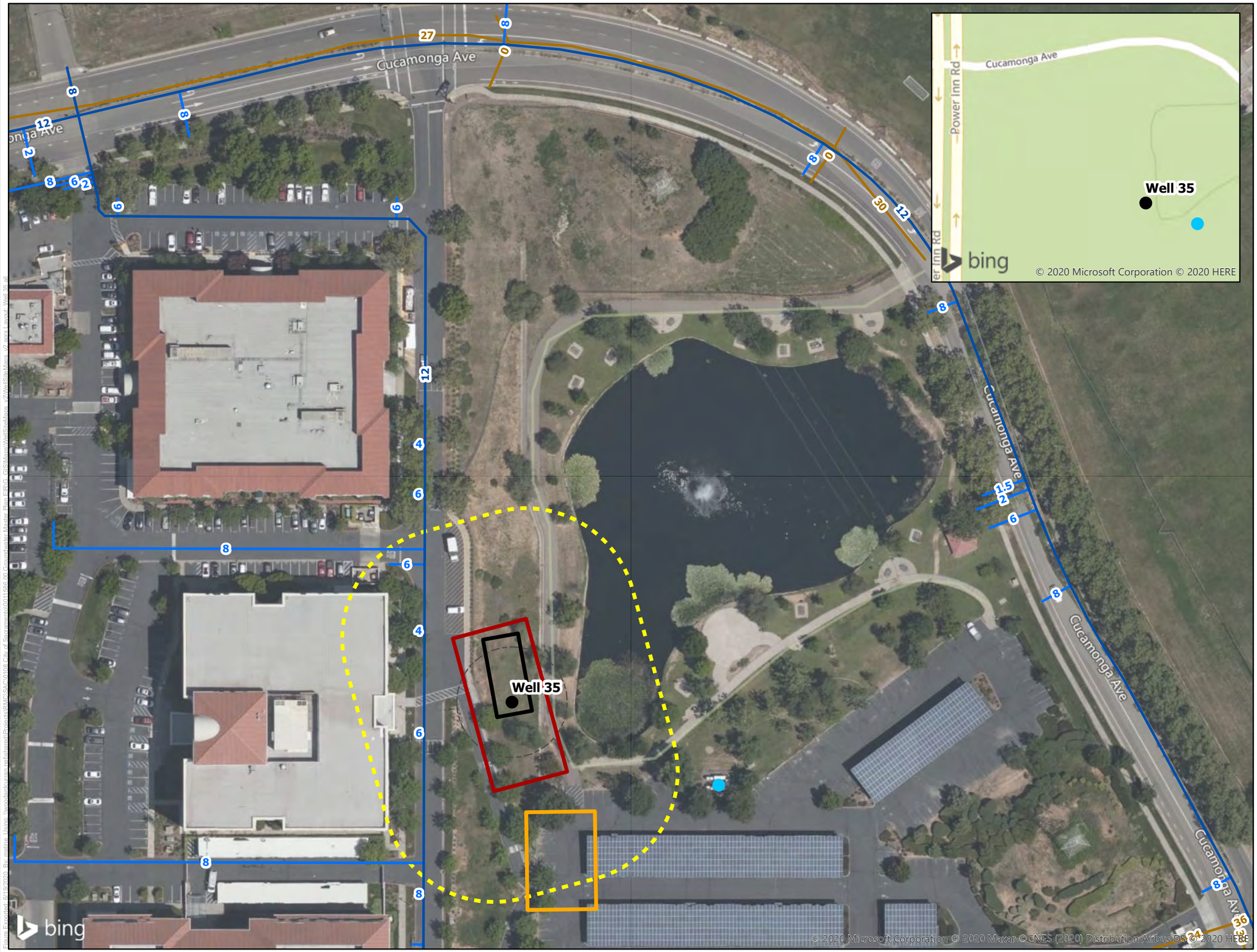
Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 35
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

N

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

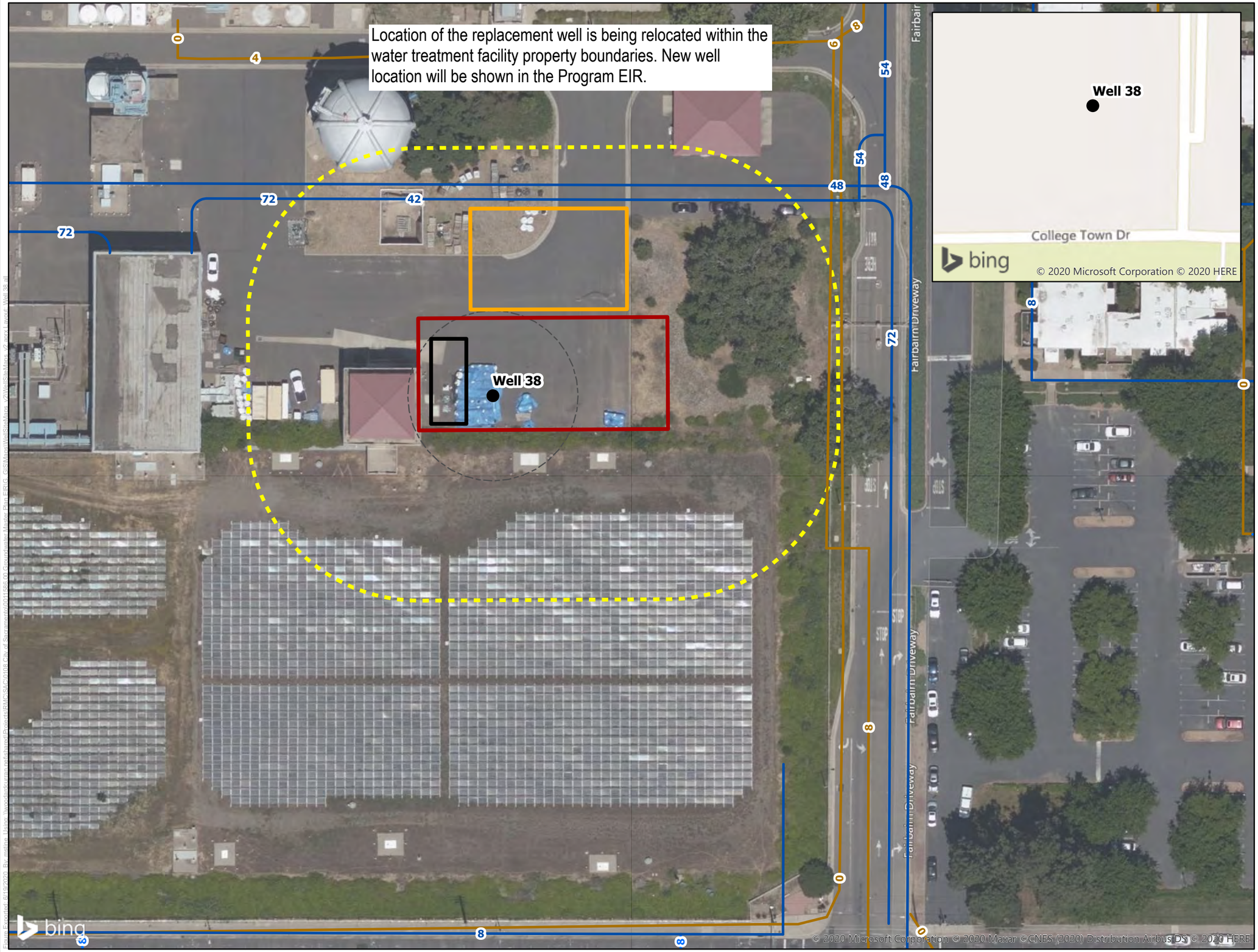
Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 38
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

Location of the replacement well is being relocated within the water treatment facility property boundaries. New well location will be shown in the Program EIR.



Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

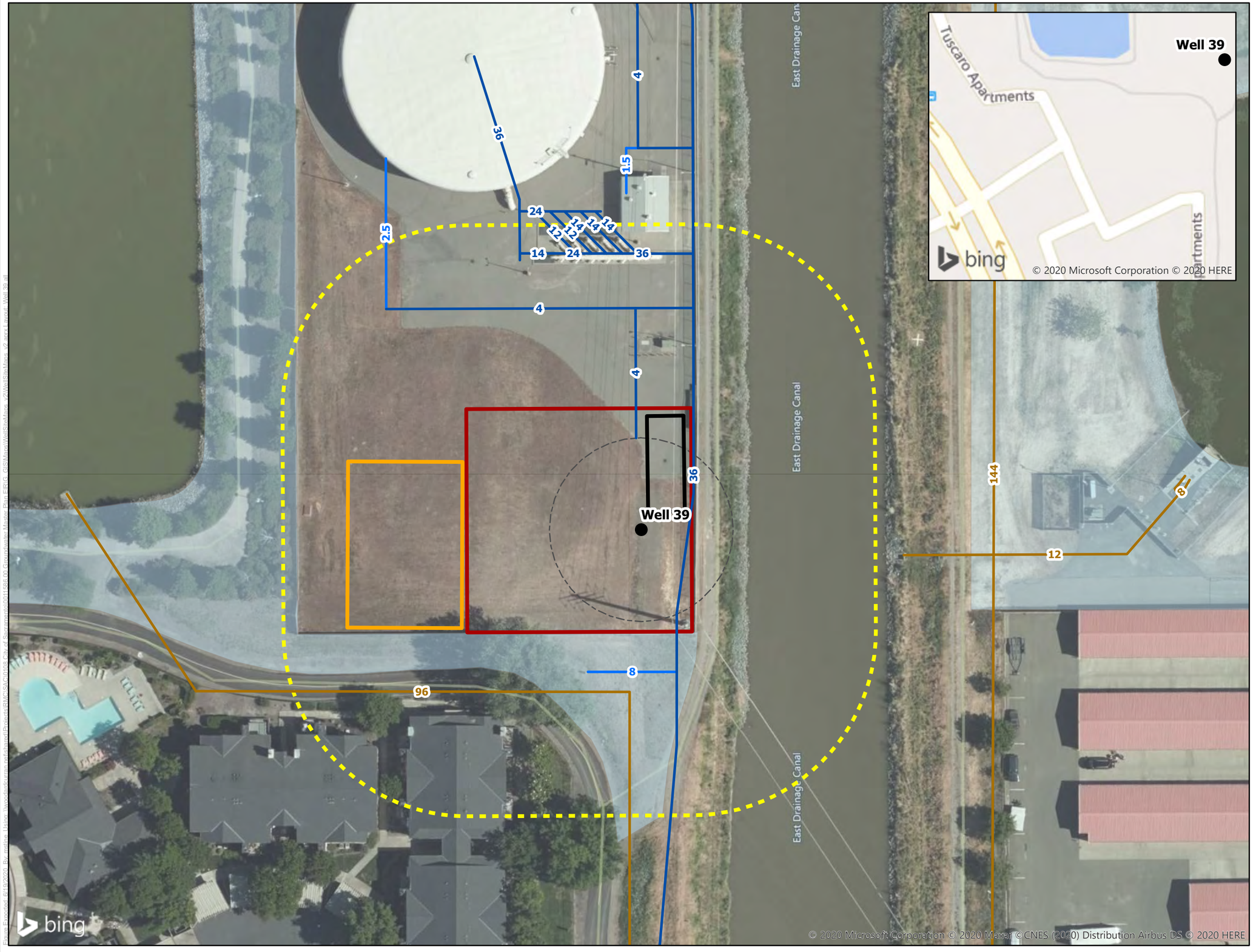
N

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**



Well 39
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

APPENDIX B: CALEEMOD RESULTS

City Sacramento Groundwater Master Plan EIR - Operational

Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	1,656.00	1000sqft	38.02	1,656,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	447.24	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - the climate registry 2020 utility-specific co2 emission factors

Land Use -

Construction Phase -

Off-road Equipment - ops emissions only

Trips and VMT - ops emissions only

Vehicle Trips - avg one trip per well per day

Consumer Products - no parking lot degreasing or cleaning

Area Coating - no onsite coatings

Energy Use - no lighting, natural gas

Water And Wastewater - no net new water use

Solid Waste - no solid waste

Stationary Sources - Emergency Generators and Fire Pumps -

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Annual

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	828000	0
tblAreaCoating	Area_Nonresidential_Interior	2484000	0
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.89
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00
tblEnergyUse	T24NG	0.83	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	590.31	447.24
tblSolidWaste	SolidWasteGenerationRate	1,556.64	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	24.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	38.00
tblVehicleTrips	ST_TR	1.68	0.03
tblVehicleTrips	SU_TR	1.68	0.03
tblVehicleTrips	WD_TR	1.68	0.03
tblWater	IndoorWaterUseRate	382,950,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1,978.7094	1,978.7094	0.1283	0.0266	1,989.8275
Mobile	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Stationary	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1007**	**0.2975**	**0.4902**	**9.2000e-004**	**0.0449**	**0.0132**	**0.0581**	**0.0120**	**0.0132**	**0.0252**	**0.0000**	**2,065.7848**	**2,065.7848**	**0.1362**	**0.0266**	**2,077.1003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1,978.7094	1,978.7094	0.1283	0.0266	1,989.8275
Mobile	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Stationary	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1007**	**0.2975**	**0.4902**	**9.2000e-004**	**0.0449**	**0.0132**	**0.0581**	**0.0120**	**0.0132**	**0.0252**	**0.0000**	**2,065.7848**	**2,065.7848**	**0.1362**	**0.0266**	**2,077.1003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	3/12/2021	5	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	0	0.00	158	0.38
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Unmitigated	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	41.40	41.40	41.40	120,404	120,404
Total	41.40	41.40	41.40	120,404	120,404

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,978.7094	1,978.7094	0.1283	0.0266	1,989.8275
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,978.7094	1,978.7094	0.1283	0.0266	1,989.8275
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	9.75384e+006	1,978.7094	0.1283	0.0266	1,989.8275
Total		**1,978.7094**	**0.1283**	**0.0266**	**1,989.8275**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	9.75384e+006	1,978.7094	0.1283	0.0266	1,989.8275
Total		**1,978.7094**	**0.1283**	**0.0266**	**1,989.8275**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Unmitigated	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Total	**1.9700e-003**	**1.9000e-004**	**0.0212**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0411**	**0.0411**	**1.1000e-004**	**0.0000**	**0.0438**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Total	**1.9700e-003**	**1.9000e-004**	**0.0212**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0411**	**0.0411**	**1.1000e-004**	**0.0000**	**0.0438**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	38	0	24	115	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (100 - 175 HP)	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Total	**0.0861**	**0.2405**	**0.3123**	**4.1000e-004**		**0.0127**	**0.0127**		**0.0127**	**0.0127**	**0.0000**	**39.9380**	**39.9380**	**5.6000e-003**	**0.0000**	**40.0780**

11.0 Vegetation

City Sacramento Groundwater Master Plan EIR - Operational

Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	1,656.00	1000sqft	38.02	1,656,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	447.24	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - the climate registry 2020 utility-specific co2 emission factors

Land Use -

Construction Phase -

Off-road Equipment - ops emissions only

Trips and VMT - ops emissions only

Vehicle Trips - avg one trip per well per day

Consumer Products - no parking lot degreasing or cleaning

Area Coating - no onsite coatings

Energy Use - no lighting, natural gas

Water And Wastewater - no net new water use

Solid Waste - no solid waste

Stationary Sources - Emergency Generators and Fire Pumps -

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Summer

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	828000	0
tblAreaCoating	Area_Nonresidential_Interior	2484000	0
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.89
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00
tblEnergyUse	T24NG	0.83	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	590.31	447.24
tblSolidWaste	SolidWasteGenerationRate	1,556.64	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	24.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	38.00
tblVehicleTrips	ST_TR	1.68	0.03
tblVehicleTrips	SU_TR	1.68	0.03
tblVehicleTrips	WD_TR	1.68	0.03
tblWater	IndoorWaterUseRate	382,950,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0872	0.2986	0.9772	3.0500e-003	0.2554	2.4400e-003	0.2578	0.0683	2.2800e-003	0.0706		308.5824	308.5824	0.0136		308.9232
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1029**	**0.3001**	**1.1465**	**3.0600e-003**	**0.2554**	**3.0400e-003**	**0.2584**	**0.0683**	**2.8800e-003**	**0.0712**		**308.9448**	**308.9448**	**0.0146**	**0.0000**	**309.3095**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0872	0.2986	0.9772	3.0500e-003	0.2554	2.4400e-003	0.2578	0.0683	2.2800e-003	0.0706		308.5824	308.5824	0.0136		308.9232
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1029**	**0.3001**	**1.1465**	**3.0600e-003**	**0.2554**	**3.0400e-003**	**0.2584**	**0.0683**	**2.8800e-003**	**0.0712**		**308.9448**	**308.9448**	**0.0146**	**0.0000**	**309.3095**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	3/12/2021	5	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	0	0.00	158	0.38
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0872	0.2986	0.9772	3.0500e-003	0.2554	2.4400e-003	0.2578	0.0683	2.2800e-003	0.0706		308.5824	308.5824	0.0136		308.9232
Unmitigated	0.0872	0.2986	0.9772	3.0500e-003	0.2554	2.4400e-003	0.2578	0.0683	2.2800e-003	0.0706		308.5824	308.5824	0.0136		308.9232

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	41.40	41.40	41.40	120,404	120,404
Total	41.40	41.40	41.40	120,404	120,404

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Unmitigated	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Total	**0.0158**	**1.5500e-003**	**0.1693**	**1.0000e-005**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**		**0.3624**	**0.3624**	**9.6000e-004**		**0.3863**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Total	**0.0158**	**1.5500e-003**	**0.1693**	**1.0000e-005**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**		**0.3624**	**0.3624**	**9.6000e-004**		**0.3863**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	38	0	24	115	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (100 - 175 HP)	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

11.0 Vegetation

City Sacramento Groundwater Master Plan EIR - Operational

Sacramento County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	1,656.00	1000sqft	38.02	1,656,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	447.24	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Winter

Project Characteristics - the climate registry 2020 utility-specific co2 emission factors

Land Use -

Construction Phase -

Off-road Equipment - ops emissions only

Trips and VMT - ops emissions only

Vehicle Trips - avg one trip per well per day

Consumer Products - no parking lot degreasing or cleaning

Area Coating - no onsite coatings

Energy Use - no lighting, natural gas

Water And Wastewater - no net new water use

Solid Waste - no solid waste

Stationary Sources - Emergency Generators and Fire Pumps -

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Winter

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	828000	0
tblAreaCoating	Area_Nonresidential_Interior	2484000	0
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.89
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00
tblEnergyUse	T24NG	0.83	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	590.31	447.24
tblSolidWaste	SolidWasteGenerationRate	1,556.64	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	24.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	38.00
tblVehicleTrips	ST_TR	1.68	0.03
tblVehicleTrips	SU_TR	1.68	0.03
tblVehicleTrips	WD_TR	1.68	0.03
tblWater	IndoorWaterUseRate	382,950,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0660	0.3210	0.8869	2.7500e-003	0.2554	2.4700e-003	0.2579	0.0683	2.3100e-003	0.0706		278.8178	278.8178	0.0134		279.1533
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0818**	**0.3226**	**1.0562**	**2.7600e-003**	**0.2554**	**3.0700e-003**	**0.2585**	**0.0683**	**2.9100e-003**	**0.0712**		**279.1802**	**279.1802**	**0.0144**	**0.0000**	**279.5396**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0660	0.3210	0.8869	2.7500e-003	0.2554	2.4700e-003	0.2579	0.0683	2.3100e-003	0.0706		278.8178	278.8178	0.0134		279.1533
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0818**	**0.3226**	**1.0562**	**2.7600e-003**	**0.2554**	**3.0700e-003**	**0.2585**	**0.0683**	**2.9100e-003**	**0.0712**		**279.1802**	**279.1802**	**0.0144**	**0.0000**	**279.5396**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	3/12/2021	5	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	0	0.00	158	0.38
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0660	0.3210	0.8869	2.7500e-003	0.2554	2.4700e-003	0.2579	0.0683	2.3100e-003	0.0706		278.8178	278.8178	0.0134		279.1533
Unmitigated	0.0660	0.3210	0.8869	2.7500e-003	0.2554	2.4700e-003	0.2579	0.0683	2.3100e-003	0.0706		278.8178	278.8178	0.0134		279.1533

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	41.40	41.40	41.40	120,404	120,404
Total	41.40	41.40	41.40	120,404	120,404

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Unmitigated	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Total	**0.0158**	**1.5500e-003**	**0.1693**	**1.0000e-005**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**		**0.3624**	**0.3624**	**9.6000e-004**		**0.3863**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0158	1.5500e-003	0.1693	1.0000e-005		6.0000e-004	6.0000e-004		6.0000e-004	6.0000e-004		0.3624	0.3624	9.6000e-004		0.3863
Total	**0.0158**	**1.5500e-003**	**0.1693**	**1.0000e-005**		**6.0000e-004**	**6.0000e-004**		**6.0000e-004**	**6.0000e-004**		**0.3624**	**0.3624**	**9.6000e-004**		**0.3863**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	38	0	24	115	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (100 - 175 HP)	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

11.0 Vegetation

City Sacramento Groundwater Master Plan EIR - Operational

Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	1,656.00	1000sqft	38.02	1,656,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	202.25	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - hypothetical 80% carbon free SMUD carbon intensity

Land Use -

Construction Phase -

Off-road Equipment - ops emissions only

Trips and VMT - ops emissions only

Vehicle Trips - avg one trip per well per day

Consumer Products - no parking lot degreasing or cleaning

Area Coating - no onsite coatings

Energy Use - no lighting, natural gas

Water And Wastewater - no net new water use

Solid Waste - no solid waste

Stationary Sources - Emergency Generators and Fire Pumps -

City Sacramento Groundwater Master Plan EIR - Operational - Sacramento County, Annual

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	828000	0
tblAreaCoating	Area_Nonresidential_Interior	2484000	0
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.89
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00
tblEnergyUse	T24NG	0.83	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	590.31	202.25
tblSolidWaste	SolidWasteGenerationRate	1,556.64	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	24.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	38.00
tblVehicleTrips	ST_TR	1.68	0.03
tblVehicleTrips	SU_TR	1.68	0.03
tblVehicleTrips	WD_TR	1.68	0.03
tblWater	IndoorWaterUseRate	382,950,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	894.8081	894.8081	0.1283	0.0266	905.9263
Mobile	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Stationary	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1007**	**0.2975**	**0.4902**	**9.2000e-004**	**0.0449**	**0.0132**	**0.0581**	**0.0120**	**0.0132**	**0.0252**	**0.0000**	**981.8835**	**981.8835**	**0.1362**	**0.0266**	**993.1990**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	894.8081	894.8081	0.1283	0.0266	905.9263
Mobile	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Stationary	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1007**	**0.2975**	**0.4902**	**9.2000e-004**	**0.0449**	**0.0132**	**0.0581**	**0.0120**	**0.0132**	**0.0252**	**0.0000**	**981.8835**	**981.8835**	**0.1362**	**0.0266**	**993.1990**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	3/12/2021	5	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	0	0.00	158	0.38
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Rubber Tired Dozers	0	0.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	0	0.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509
Unmitigated	0.0127	0.0567	0.1568	5.1000e-004	0.0449	4.5000e-004	0.0453	0.0120	4.2000e-004	0.0125	0.0000	47.0964	47.0964	2.1800e-003	0.0000	47.1509

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Refrigerated Warehouse-No Rail	41.40	41.40	41.40	120,404	120,404
Total	41.40	41.40	41.40	120,404	120,404

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Refrigerated Warehouse-No	10.00	5.00	6.50	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Refrigerated Warehouse-No Rail	0.559527	0.038733	0.206173	0.118029	0.019040	0.005245	0.018552	0.023249	0.002031	0.002054	0.005884	0.000619	0.000865

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	894.8081	894.8081	0.1283	0.0266	905.9263
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	894.8081	894.8081	0.1283	0.0266	905.9263
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	9.75384e+006	894.8081	0.1283	0.0266	905.9263
Total		**894.8081**	**0.1283**	**0.0266**	**905.9263**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Refrigerated Warehouse-No Rail	9.75384e+006	894.8081	0.1283	0.0266	905.9263
Total		**894.8081**	**0.1283**	**0.0266**	**905.9263**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Unmitigated	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Total	**1.9700e-003**	**1.9000e-004**	**0.0212**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0411**	**0.0411**	**1.1000e-004**	**0.0000**	**0.0438**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9700e-003	1.9000e-004	0.0212	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0411	0.0411	1.1000e-004	0.0000	0.0438
Total	**1.9700e-003**	**1.9000e-004**	**0.0212**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0411**	**0.0411**	**1.1000e-004**	**0.0000**	**0.0438**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Refrigerated Warehouse-No Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Refrigerated Warehouse-No Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	38	0	24	115	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (100 - 175 HP)	0.0861	0.2405	0.3123	4.1000e-004		0.0127	0.0127		0.0127	0.0127	0.0000	39.9380	39.9380	5.6000e-003	0.0000	40.0780
Total	**0.0861**	**0.2405**	**0.3123**	**4.1000e-004**		**0.0127**	**0.0127**		**0.0127**	**0.0127**	**0.0000**	**39.9380**	**39.9380**	**5.6000e-003**	**0.0000**	**40.0780**

11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	44.00	1000sqft	1.01	44,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - project specific info

Off-road Equipment - project specific info

Off-road Equipment -

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info

Off-road Equipment - project info

Off-road Equipment -

Demolition -

Trips and VMT - project info

Vehicle Trips - project info

Area Coating - project info

Energy Use - project info

Water And Wastewater - project info

Solid Waste - project info

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - SMAQMD basic dust control

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	22000	0
tblAreaCoating	Area_Nonresidential_Interior	66000	0
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	5

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tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	200.00	35.00
tblConstructionPhase	NumDays	200.00	28.00
tblConstructionPhase	NumDays	20.00	4.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	150.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	12/13/2021	3/31/2021
tblConstructionPhase	PhaseEndDate	11/15/2021	2/22/2021
tblConstructionPhase	PhaseEndDate	1/29/2021	1/7/2021
tblConstructionPhase	PhaseEndDate	2/8/2021	1/25/2021
tblConstructionPhase	PhaseEndDate	11/29/2021	2/24/2021
tblConstructionPhase	PhaseEndDate	2/2/2021	1/21/2021
tblConstructionPhase	PhaseStartDate	11/30/2021	2/25/2021
tblConstructionPhase	PhaseStartDate	2/9/2021	1/26/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	1/22/2021
tblConstructionPhase	PhaseStartDate	11/16/2021	2/23/2021
tblConstructionPhase	PhaseStartDate	1/30/2021	1/8/2021
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.83
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00

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tblEnergyUse	T24NG	0.83	0.00
tblGrading	AcresOfGrading	5.00	1.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
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tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00

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tblOffRoadEquipment	UsageHours	8.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	41.36	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	40.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripNumber	10.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	28.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	6.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	7.00	12.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
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tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	10.00
tblTripsAndVMT	VendorTripNumber	7.00	2.00
tblVehicleTrips	ST_TR	1.68	0.10
tblVehicleTrips	SU_TR	1.68	0.10
tblVehicleTrips	WD_TR	1.68	0.10
tblWater	IndoorWaterUseRate	10,175,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.3113	2.5094	2.1748	5.3800e-003	0.0460	0.1102	0.1562	0.0195	0.1053	0.1249	0.0000	461.9460	461.9460	0.1093	0.0000	464.6777
Maximum	**0.3113**	**2.5094**	**2.1748**	**5.3800e-003**	**0.0460**	**0.1102**	**0.1562**	**0.0195**	**0.1053**	**0.1249**	**0.0000**	**461.9460**	**461.9460**	**0.1093**	**0.0000**	**464.6777**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.3113	2.5094	2.1748	5.3800e-003	0.0299	0.1102	0.1400	0.0113	0.1053	0.1166	0.0000	461.9455	461.9455	0.1093	0.0000	464.6772
Maximum	**0.3113**	**2.5094**	**2.1748**	**5.3800e-003**	**0.0299**	**0.1102**	**0.1400**	**0.0113**	**0.1053**	**0.1166**	**0.0000**	**461.9455**	**461.9455**	**0.1093**	**0.0000**	**464.6772**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**35.08**	**0.00**	**10.34**	**42.35**	**0.00**	**6.63**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-4-2021**	**4-3-2021**	1.3907	1.3907
2	**4-4-2021**	**7-3-2021**	0.4697	0.4697
3	**7-4-2021**	**9-30-2021**	0.5440	0.5440
		Highest	1.3907	1.3907

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1719	1.0000e-005	5.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0900e-003	1.0900e-003	0.0000	0.0000	1.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	68.6858	68.6858	3.3700e-003	7.0000e-004	68.9782
Mobile	1.3500e-003	6.0300e-003	0.0167	5.0000e-005	4.7700e-003	5.0000e-005	4.8200e-003	1.2800e-003	4.0000e-005	1.3200e-003	0.0000	5.0054	5.0054	2.3000e-004	0.0000	5.0112
Stationary	3.7700e-003	0.0106	0.0137	2.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	1.7517	1.7517	2.5000e-004	0.0000	1.7578
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1770**	**0.0166**	**0.0309**	**7.0000e-005**	**4.7700e-003**	**6.1000e-004**	**5.3800e-003**	**1.2800e-003**	**6.0000e-004**	**1.8800e-003**	**0.0000**	**75.4440**	**75.4440**	**3.8500e-003**	**7.0000e-004**	**75.7484**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1719	1.0000e-005	5.6000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0900e-003	1.0900e-003	0.0000	0.0000	1.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	68.6858	68.6858	3.3700e-003	7.0000e-004	68.9782
Mobile	1.3500e-003	6.0300e-003	0.0167	5.0000e-005	4.7700e-003	5.0000e-005	4.8200e-003	1.2800e-003	4.0000e-005	1.3200e-003	0.0000	5.0054	5.0054	2.3000e-004	0.0000	5.0112
Stationary	3.7700e-003	0.0106	0.0137	2.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	1.7517	1.7517	2.5000e-004	0.0000	1.7578
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1770**	**0.0166**	**0.0309**	**7.0000e-005**	**4.7700e-003**	**6.1000e-004**	**5.3800e-003**	**1.2800e-003**	**6.0000e-004**	**1.8800e-003**	**0.0000**	**75.4440**	**75.4440**	**3.8500e-003**	**7.0000e-004**	**75.7484**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

City Sacramento Groundwater Master Plan EIR - Sacramento County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Well Destruction/Demolition	Demolition	1/4/2021	1/7/2021	5	4	
2	Site Preparation	Site Preparation	1/8/2021	1/21/2021	5	10	
3	Mobilization	Building Construction	1/22/2021	1/25/2021	5	2	
4	Test Well Drilling	Building Construction	1/26/2021	2/22/2021	7	28	
5	Test Well Testing	Building Construction	2/23/2021	2/24/2021	5	2	
6	Production Well Drilling/Construction	Building Construction	2/25/2021	3/31/2021	7	35	
7	Production Well Development/Testing	Building Construction	4/1/2021	4/28/2021	5	20	
8	Demobilization	Building Construction	4/29/2021	4/30/2021	5	2	
9	Well Equipping Construction	Building Construction	5/3/2021	11/26/2021	5	150	
10	Site Paving/Landscaping	Paving	11/29/2021	12/10/2021	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Production Well Development/Testing	Welders	0	0.00	46	0.45
Demobilization	Welders	0	0.00	46	0.45
Well Equipping Construction	Welders	3	8.00	46	0.45
Well Destruction/Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Mobilization	Off-Highway Trucks	1	4.00	402	0.38
Test Well Drilling	Air Compressors	1	8.00	78	0.48

Test Well Drilling	Bore/Drill Rigs	1	24.00	221	0.50
Test Well Drilling	Off-Highway Trucks	4	8.00	402	0.38
Test Well Testing	Pumps	1	8.00	84	0.74
Test Well Testing	Off-Highway Trucks	1	8.00	402	0.38
Production Well Drilling/Construction	Bore/Drill Rigs	1	24.00	221	0.50
Production Well Drilling/Construction	Off-Highway Trucks	4	8.00	402	0.38
Production Well Drilling/Construction	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Off-Highway Trucks	1	8.00	402	0.38
Demobilization	Off-Highway Trucks	1	8.00	402	0.38
Well Equipping Construction	Air Compressors	1	8.00	78	0.48
Production Well Drilling/Construction	Air Compressors	1	6.00	78	0.48
Test Well Testing	Cement and Mortar Mixers	0	0.00	9	0.56
Well Destruction/Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Test Well Drilling	Generator Sets	0	0.00	84	0.74
Test Well Drilling	Cranes	0	0.00	231	0.29
Test Well Drilling	Forklifts	0	0.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Test Well Testing	Pavers	0	0.00	130	0.42
Test Well Testing	Rollers	0	0.00	80	0.38
Well Destruction/Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Mobilization	Rubber Tired Dozers	0	0.00	247	0.40
Test Well Drilling	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Destruction/Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Test Well Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Mobilization	Graders	0	0.00	187	0.41
Test Well Testing	Paving Equipment	0	0.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Test Well Drilling	Welders	1	8.00	46	0.45
Site Paving/Landscaping	Cement and Mortar Mixers	1	6.00	9	0.56
Mobilization	Cranes	0	0.00	231	0.29
Test Well Testing	Cranes	0	0.00	231	0.29
Production Well Drilling/Construction	Cranes	0	0.00	231	0.29
Production Well Development/Testing	Cranes	0	0.00	231	0.29
Demobilization	Cranes	0	0.00	231	0.29
Well Equipping Construction	Cranes	1	6.00	231	0.29
Mobilization	Forklifts	0	0.00	89	0.20
Test Well Testing	Forklifts	0	0.00	89	0.20
Production Well Drilling/Construction	Forklifts	0	0.00	89	0.20
Production Well Development/Testing	Forklifts	0	0.00	89	0.20
Demobilization	Forklifts	0	0.00	89	0.20
Well Equipping Construction	Forklifts	0	0.00	89	0.20
Mobilization	Generator Sets	0	0.00	84	0.74
Test Well Testing	Generator Sets	0	0.00	84	0.74
Production Well Drilling/Construction	Generator Sets	0	0.00	84	0.74
Production Well Development/Testing	Generator Sets	0	0.00	84	0.74
Demobilization	Generator Sets	0	0.00	84	0.74
Well Equipping Construction	Generator Sets	1	8.00	84	0.74
Site Paving/Landscaping	Pavers	1	6.00	130	0.42
Site Paving/Landscaping	Paving Equipment	1	8.00	132	0.36
Site Paving/Landscaping	Rollers	1	7.00	80	0.38
Production Well Drilling/Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Production Well Development/Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Demobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Equipping Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Paving/Landscaping	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Welders	0	0.00	46	0.45
Test Well Testing	Welders	0	0.00	46	0.45
Production Well Drilling/Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Destruction/Demolition	4	10.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	28.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	1	18.00	12.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Drilling	7	18.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Drilling/Construction	8	18.00	0.00	6.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Development/Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization	1	18.00	10.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Well Equipping Construction	7	18.00	2.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Paving/Landscaping	5	13.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Well Destruction/Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0800e-003	0.0000	1.0800e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3500e-003	0.0326	0.0206	4.0000e-005		1.6600e-003	1.6600e-003		1.5600e-003	1.5600e-003	0.0000	3.2140	3.2140	7.3000e-004	0.0000	3.2324
Total	**3.3500e-003**	**0.0326**	**0.0206**	**4.0000e-005**	**1.0800e-003**	**1.6600e-003**	**2.7400e-003**	**1.6000e-004**	**1.5600e-003**	**1.7200e-003**	**0.0000**	**3.2140**	**3.2140**	**7.3000e-004**	**0.0000**	**3.2324**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.1000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1257	0.1257	0.0000	0.0000	0.1258
Total	**8.0000e-005**	**3.1000e-004**	**5.7000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2013**	**0.2013**	**0.0000**	**0.0000**	**0.2015**

3.2 Well Destruction/Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.8000e-004	0.0000	4.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3500e-003	0.0326	0.0206	4.0000e-005		1.6600e-003	1.6600e-003		1.5600e-003	1.5600e-003	0.0000	3.2140	3.2140	7.3000e-004	0.0000	3.2324
Total	**3.3500e-003**	**0.0326**	**0.0206**	**4.0000e-005**	**4.8000e-004**	**1.6600e-003**	**2.1400e-003**	**7.0000e-005**	**1.5600e-003**	**1.6300e-003**	**0.0000**	**3.2140**	**3.2140**	**7.3000e-004**	**0.0000**	**3.2324**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.1000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1257	0.1257	0.0000	0.0000	0.1258
Total	**8.0000e-005**	**3.1000e-004**	**5.7000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2013**	**0.2013**	**0.0000**	**0.0000**	**0.2015**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0269	0.0000	0.0269	0.0145	0.0000	0.0145	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7800e-003	0.0871	0.0378	9.0000e-005		3.8300e-003	3.8300e-003		3.5200e-003	3.5200e-003	0.0000	7.5592	7.5592	2.4400e-003	0.0000	7.6203
Total	**7.7800e-003**	**0.0871**	**0.0378**	**9.0000e-005**	**0.0269**	**3.8300e-003**	**0.0307**	**0.0145**	**3.5200e-003**	**0.0181**	**0.0000**	**7.5592**	**7.5592**	**2.4400e-003**	**0.0000**	**7.6203**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	3.6900e-003	8.4000e-004	1.0000e-005	2.4000e-004	1.0000e-005	2.5000e-004	6.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.0587	1.0587	6.0000e-005	0.0000	1.0603
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	9.0000e-005	1.0100e-003	0.0000	2.9000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2514	0.2514	1.0000e-005	0.0000	0.2516
Total	**2.4000e-004**	**3.7800e-003**	**1.8500e-003**	**1.0000e-005**	**5.3000e-004**	**1.0000e-005**	**5.5000e-004**	**1.4000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**1.3102**	**1.3102**	**7.0000e-005**	**0.0000**	**1.3119**

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0121	0.0000	0.0121	6.5400e-003	0.0000	6.5400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7800e-003	0.0871	0.0378	9.0000e-005		3.8300e-003	3.8300e-003		3.5200e-003	3.5200e-003	0.0000	7.5592	7.5592	2.4400e-003	0.0000	7.6203
Total	**7.7800e-003**	**0.0871**	**0.0378**	**9.0000e-005**	**0.0121**	**3.8300e-003**	**0.0159**	**6.5400e-003**	**3.5200e-003**	**0.0101**	**0.0000**	**7.5592**	**7.5592**	**2.4400e-003**	**0.0000**	**7.6203**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	3.6900e-003	8.4000e-004	1.0000e-005	2.3000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	1.0587	1.0587	6.0000e-005	0.0000	1.0603
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	9.0000e-005	1.0100e-003	0.0000	2.8000e-004	0.0000	2.8000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2514	0.2514	1.0000e-005	0.0000	0.2516
Total	**2.4000e-004**	**3.7800e-003**	**1.8500e-003**	**1.0000e-005**	**5.1000e-004**	**1.0000e-005**	**5.2000e-004**	**1.4000e-004**	**1.0000e-005**	**1.5000e-004**	**0.0000**	**1.3102**	**1.3102**	**7.0000e-005**	**0.0000**	**1.3119**

3.4 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0000e-004	2.6400e-003	1.8100e-003	1.0000e-005		1.0000e-004	1.0000e-004		9.0000e-005	9.0000e-005	0.0000	0.5828	0.5828	1.9000e-004	0.0000	0.5875
Total	**3.0000e-004**	**2.6400e-003**	**1.8100e-003**	**1.0000e-005**		**1.0000e-004**	**1.0000e-004**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.5828**	**0.5828**	**1.9000e-004**	**0.0000**	**0.5875**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.2300e-003	3.3000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2816	0.2816	2.0000e-005	0.0000	0.2820
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**1.0000e-004**	**1.2700e-003**	**7.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.3947**	**0.3947**	**2.0000e-005**	**0.0000**	**0.3952**

3.4 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0000e-004	2.6400e-003	1.8100e-003	1.0000e-005		1.0000e-004	1.0000e-004		9.0000e-005	9.0000e-005	0.0000	0.5828	0.5828	1.9000e-004	0.0000	0.5875
Total	**3.0000e-004**	**2.6400e-003**	**1.8100e-003**	**1.0000e-005**		**1.0000e-004**	**1.0000e-004**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.5828**	**0.5828**	**1.9000e-004**	**0.0000**	**0.5875**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	1.2300e-003	3.3000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2816	0.2816	2.0000e-005	0.0000	0.2820
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**1.0000e-004**	**1.2700e-003**	**7.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3947**	**0.3947**	**2.0000e-005**	**0.0000**	**0.3952**

3.5 Test Well Drilling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0533	0.4734	0.3484	1.2300e-003		0.0175	0.0175		0.0164	0.0164	0.0000	107.6028	107.6028	0.0331	0.0000	108.4298
Total	**0.0533**	**0.4734**	**0.3484**	**1.2300e-003**		**0.0175**	**0.0175**		**0.0164**	**0.0164**	**0.0000**	**107.6028**	**107.6028**	**0.0331**	**0.0000**	**108.4298**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	5.7000e-004	6.3800e-003	2.0000e-005	1.8500e-003	1.0000e-005	1.8600e-003	4.9000e-004	1.0000e-005	5.0000e-004	0.0000	1.5840	1.5840	4.0000e-005	0.0000	1.5851
Total	**8.8000e-004**	**8.3000e-004**	**6.4400e-003**	**2.0000e-005**	**1.8700e-003**	**1.0000e-005**	**1.8800e-003**	**4.9000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.6596**	**1.6596**	**4.0000e-005**	**0.0000**	**1.6608**

3.5 Test Well Drilling - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0533	0.4734	0.3484	1.2300e-003		0.0175	0.0175		0.0164	0.0164	0.0000	107.6027	107.6027	0.0331	0.0000	108.4296
Total	**0.0533**	**0.4734**	**0.3484**	**1.2300e-003**		**0.0175**	**0.0175**		**0.0164**	**0.0164**	**0.0000**	**107.6027**	**107.6027**	**0.0331**	**0.0000**	**108.4296**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	5.7000e-004	6.3800e-003	2.0000e-005	1.7700e-003	1.0000e-005	1.7800e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.5840	1.5840	4.0000e-005	0.0000	1.5851
Total	**8.8000e-004**	**8.3000e-004**	**6.4400e-003**	**2.0000e-005**	**1.7900e-003**	**1.0000e-005**	**1.8000e-003**	**4.7000e-004**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**1.6596**	**1.6596**	**4.0000e-005**	**0.0000**	**1.6608**

3.6 Test Well Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.9000e-004	8.5000e-003	7.3600e-003	2.0000e-005		3.7000e-004	3.7000e-004		3.6000e-004	3.6000e-004	0.0000	1.7309	1.7309	4.1000e-004	0.0000	1.7411
Total	**9.9000e-004**	**8.5000e-003**	**7.3600e-003**	**2.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.6000e-004**	**3.6000e-004**	**0.0000**	**1.7309**	**1.7309**	**4.1000e-004**	**0.0000**	**1.7411**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**6.0000e-005**	**4.0000e-005**	**4.6000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1131**	**0.1131**	**0.0000**	**0.0000**	**0.1132**

3.6 Test Well Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.9000e-004	8.5000e-003	7.3600e-003	2.0000e-005		3.7000e-004	3.7000e-004		3.6000e-004	3.6000e-004	0.0000	1.7309	1.7309	4.1000e-004	0.0000	1.7411
Total	**9.9000e-004**	**8.5000e-003**	**7.3600e-003**	**2.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.6000e-004**	**3.6000e-004**	**0.0000**	**1.7309**	**1.7309**	**4.1000e-004**	**0.0000**	**1.7411**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**6.0000e-005**	**4.0000e-005**	**4.6000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1131**	**0.1131**	**0.0000**	**0.0000**	**0.1132**

3.7 Production Well Drilling/Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0720	0.6391	0.4903	1.6400e-003		0.0245	0.0245		0.0230	0.0230	0.0000	142.9053	142.9053	0.0418	0.0000	143.9499
Total	**0.0720**	**0.6391**	**0.4903**	**1.6400e-003**		**0.0245**	**0.0245**		**0.0230**	**0.0230**	**0.0000**	**142.9053**	**142.9053**	**0.0418**	**0.0000**	**143.9499**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.9000e-004	1.8000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.2269	0.2269	1.0000e-005	0.0000	0.2272
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0900e-003	7.1000e-004	7.9700e-003	2.0000e-005	2.3100e-003	2.0000e-005	2.3300e-003	6.2000e-004	1.0000e-005	6.3000e-004	0.0000	1.9800	1.9800	5.0000e-005	0.0000	1.9813
Total	**1.1100e-003**	**1.5000e-003**	**8.1500e-003**	**2.0000e-005**	**2.3600e-003**	**2.0000e-005**	**2.3800e-003**	**6.3000e-004**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**2.2069**	**2.2069**	**6.0000e-005**	**0.0000**	**2.2085**

3.7 Production Well Drilling/Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0720	0.6391	0.4903	1.6400e-003		0.0245	0.0245		0.0230	0.0230	0.0000	142.9051	142.9051	0.0418	0.0000	143.9497
Total	**0.0720**	**0.6391**	**0.4903**	**1.6400e-003**		**0.0245**	**0.0245**		**0.0230**	**0.0230**	**0.0000**	**142.9051**	**142.9051**	**0.0418**	**0.0000**	**143.9497**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.9000e-004	1.8000e-004	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.2269	0.2269	1.0000e-005	0.0000	0.2272
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0900e-003	7.1000e-004	7.9700e-003	2.0000e-005	2.2100e-003	2.0000e-005	2.2300e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	1.9800	1.9800	5.0000e-005	0.0000	1.9813
Total	**1.1100e-003**	**1.5000e-003**	**8.1500e-003**	**2.0000e-005**	**2.2600e-003**	**2.0000e-005**	**2.2800e-003**	**6.0000e-004**	**1.0000e-005**	**6.3000e-004**	**0.0000**	**2.2069**	**2.2069**	**6.0000e-005**	**0.0000**	**2.2085**

3.8 Production Well Development/Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8900e-003	0.0850	0.0736	2.0000e-004		3.7200e-003	3.7200e-003		3.5600e-003	3.5600e-003	0.0000	17.3086	17.3086	4.0800e-003	0.0000	17.4106
Total	**9.8900e-003**	**0.0850**	**0.0736**	**2.0000e-004**		**3.7200e-003**	**3.7200e-003**		**3.5600e-003**	**3.5600e-003**	**0.0000**	**17.3086**	**17.3086**	**4.0800e-003**	**0.0000**	**17.4106**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.1000e-004	4.5600e-003	1.0000e-005	1.3200e-003	1.0000e-005	1.3300e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.1314	1.1314	3.0000e-005	0.0000	1.1322
Total	**6.2000e-004**	**4.1000e-004**	**4.5600e-003**	**1.0000e-005**	**1.3200e-003**	**1.0000e-005**	**1.3300e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.1314**	**1.1314**	**3.0000e-005**	**0.0000**	**1.1322**

3.8 Production Well Development/Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8900e-003	0.0850	0.0736	2.0000e-004		3.7200e-003	3.7200e-003		3.5600e-003	3.5600e-003	0.0000	17.3086	17.3086	4.0800e-003	0.0000	17.4106
Total	**9.8900e-003**	**0.0850**	**0.0736**	**2.0000e-004**		**3.7200e-003**	**3.7200e-003**		**3.5600e-003**	**3.5600e-003**	**0.0000**	**17.3086**	**17.3086**	**4.0800e-003**	**0.0000**	**17.4106**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.1000e-004	4.5600e-003	1.0000e-005	1.2600e-003	1.0000e-005	1.2700e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.1314	1.1314	3.0000e-005	0.0000	1.1322
Total	**6.2000e-004**	**4.1000e-004**	**4.5600e-003**	**1.0000e-005**	**1.2600e-003**	**1.0000e-005**	**1.2700e-003**	**3.4000e-004**	**1.0000e-005**	**3.5000e-004**	**0.0000**	**1.1314**	**1.1314**	**3.0000e-005**	**0.0000**	**1.1322**

3.9 Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1000e-004	5.2900e-003	3.6200e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.8000e-004	1.8000e-004	0.0000	1.1657	1.1657	3.8000e-004	0.0000	1.1751
Total	**6.1000e-004**	**5.2900e-003**	**3.6200e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.1657**	**1.1657**	**3.8000e-004**	**0.0000**	**1.1751**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	1.0200e-003	2.7000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2346	0.2346	1.0000e-005	0.0000	0.2350
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**9.0000e-005**	**1.0600e-003**	**7.3000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.3478**	**0.3478**	**1.0000e-005**	**0.0000**	**0.3482**

3.9 Demobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1000e-004	5.2900e-003	3.6200e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.8000e-004	1.8000e-004	0.0000	1.1657	1.1657	3.8000e-004	0.0000	1.1751
Total	**6.1000e-004**	**5.2900e-003**	**3.6200e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.1657**	**1.1657**	**3.8000e-004**	**0.0000**	**1.1751**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	1.0200e-003	2.7000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2346	0.2346	1.0000e-005	0.0000	0.2350
Worker	6.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1131	0.1131	0.0000	0.0000	0.1132
Total	**9.0000e-005**	**1.0600e-003**	**7.3000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.3478**	**0.3478**	**1.0000e-005**	**0.0000**	**0.3482**

3.10 Well Equipping Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1506	1.1091	1.0835	1.8600e-003		0.0560	0.0560		0.0546	0.0546	0.0000	154.1394	154.1394	0.0236	0.0000	154.7298
Total	**0.1506**	**1.1091**	**1.0835**	**1.8600e-003**		**0.0560**	**0.0560**		**0.0546**	**0.0546**	**0.0000**	**154.1394**	**154.1394**	**0.0236**	**0.0000**	**154.7298**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	4.7000e-004	0.0153	4.1000e-003	4.0000e-005	8.8000e-004	4.0000e-005	9.2000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.5197	3.5197	2.0000e-004	0.0000	3.5247
Worker	4.6700e-003	3.0500e-003	0.0342	9.0000e-005	9.9100e-003	7.0000e-005	9.9800e-003	2.6400e-003	6.0000e-005	2.7000e-003	0.0000	8.4858	8.4858	2.2000e-004	0.0000	8.4914
Total	**5.1500e-003**	**0.0187**	**0.0383**	**1.3000e-004**	**0.0108**	**1.1000e-004**	**0.0109**	**2.8900e-003**	**1.0000e-004**	**3.0000e-003**	**0.0000**	**12.0811**	**12.0811**	**4.2000e-004**	**0.0000**	**12.0918**

3.10 Well Equipping Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1506	1.1091	1.0835	1.8600e-003		0.0560	0.0560		0.0546	0.0546	0.0000	154.1392	154.1392	0.0236	0.0000	154.7296
Total	**0.1506**	**1.1091**	**1.0835**	**1.8600e-003**		**0.0560**	**0.0560**		**0.0546**	**0.0546**	**0.0000**	**154.1392**	**154.1392**	**0.0236**	**0.0000**	**154.7296**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.6000e-004	6.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0756	0.0756	0.0000	0.0000	0.0757
Vendor	4.7000e-004	0.0153	4.1000e-003	4.0000e-005	8.5000e-004	4.0000e-005	8.9000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.5197	3.5197	2.0000e-004	0.0000	3.5247
Worker	4.6700e-003	3.0500e-003	0.0342	9.0000e-005	9.4900e-003	7.0000e-005	9.5600e-003	2.5300e-003	6.0000e-005	2.6000e-003	0.0000	8.4858	8.4858	2.2000e-004	0.0000	8.4914
Total	**5.1500e-003**	**0.0187**	**0.0383**	**1.3000e-004**	**0.0104**	**1.1000e-004**	**0.0105**	**2.7800e-003**	**1.0000e-004**	**2.9000e-003**	**0.0000**	**12.0811**	**12.0811**	**4.2000e-004**	**0.0000**	**12.0918**

3.11 Site Paving/Landscaping - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8700e-003	0.0387	0.0443	7.0000e-005		2.0800e-003	2.0800e-003		1.9100e-003	1.9100e-003	0.0000	5.8825	5.8825	1.8600e-003	0.0000	5.9291
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.8700e-003**	**0.0387**	**0.0443**	**7.0000e-005**		**2.0800e-003**	**2.0800e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**5.8825**	**5.8825**	**1.8600e-003**	**0.0000**	**5.9291**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.6500e-003	0.0000	4.8000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4086	0.4086	1.0000e-005	0.0000	0.4088
Total	**2.3000e-004**	**1.5000e-004**	**1.6500e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4086**	**0.4086**	**1.0000e-005**	**0.0000**	**0.4088**

3.11 Site Paving/Landscaping - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8700e-003	0.0387	0.0443	7.0000e-005		2.0800e-003	2.0800e-003		1.9100e-003	1.9100e-003	0.0000	5.8825	5.8825	1.8600e-003	0.0000	5.9291
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.8700e-003**	**0.0387**	**0.0443**	**7.0000e-005**		**2.0800e-003**	**2.0800e-003**		**1.9100e-003**	**1.9100e-003**	**0.0000**	**5.8825**	**5.8825**	**1.8600e-003**	**0.0000**	**5.9291**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.6500e-003	0.0000	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4086	0.4086	1.0000e-005	0.0000	0.4088
Total	**2.3000e-004**	**1.5000e-004**	**1.6500e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4086**	**0.4086**	**1.0000e-005**	**0.0000**	**0.4088**

4.0 Operational Detail - Mobile

City Sacramento Groundwater Master Plan EIR

Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	44.00	1000sqft	1.01	44,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - project specific info

Off-road Equipment - project specific info

Off-road Equipment -

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info

Off-road Equipment - project info

Off-road Equipment -

Demolition -

Trips and VMT - project info

Vehicle Trips - project info

Area Coating - project info

Energy Use - project info

Water And Wastewater - project info

Solid Waste - project info

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - SMAQMD basic dust control

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	22000	0
tblAreaCoating	Area_Nonresidential_Interior	66000	0
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	5

City Sacramento Groundwater Master Plan EIR - Sacramento County, Summer

tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	200.00	35.00
tblConstructionPhase	NumDays	200.00	28.00
tblConstructionPhase	NumDays	20.00	4.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	150.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	12/13/2021	3/31/2021
tblConstructionPhase	PhaseEndDate	11/15/2021	2/22/2021
tblConstructionPhase	PhaseEndDate	1/29/2021	1/7/2021
tblConstructionPhase	PhaseEndDate	2/8/2021	1/25/2021
tblConstructionPhase	PhaseEndDate	11/29/2021	2/24/2021
tblConstructionPhase	PhaseEndDate	2/2/2021	1/21/2021
tblConstructionPhase	PhaseStartDate	11/30/2021	2/25/2021
tblConstructionPhase	PhaseStartDate	2/9/2021	1/26/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	1/22/2021
tblConstructionPhase	PhaseStartDate	11/16/2021	2/23/2021
tblConstructionPhase	PhaseStartDate	1/30/2021	1/8/2021
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.83
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00

City Sacramento Groundwater Master Plan EIR - Sacramento County, Summer

tblEnergyUse	T24NG	0.83	0.00
tblGrading	AcresOfGrading	5.00	1.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
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tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	41.36	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	40.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripNumber	10.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	28.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	6.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	7.00	12.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	10.00
tblTripsAndVMT	VendorTripNumber	7.00	2.00
tblVehicleTrips	ST_TR	1.68	0.10
tblVehicleTrips	SU_TR	1.68	0.10
tblVehicleTrips	WD_TR	1.68	0.10
tblWater	IndoorWaterUseRate	10,175,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.1894	36.5988	28.5681	0.0951	5.4849	1.3993	6.2532	2.9374	1.3150	3.6443	0.0000	9,153.8423	9,153.8423	2.6364	0.0000	9,219.7531
Maximum	**4.1894**	**36.5988**	**28.5681**	**0.0951**	**5.4849**	**1.3993**	**6.2532**	**2.9374**	**1.3150**	**3.6443**	**0.0000**	**9,153.8423**	**9,153.8423**	**2.6364**	**0.0000**	**9,219.7531**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.1894	36.5988	28.5681	0.0951	2.5240	1.3993	3.2923	1.3369	1.3150	2.0438	0.0000	9,153.8423	9,153.8423	2.6364	0.0000	9,219.7531
Maximum	**4.1894**	**36.5988**	**28.5681**	**0.0951**	**2.5240**	**1.3993**	**3.2923**	**1.3369**	**1.3150**	**2.0438**	**0.0000**	**9,153.8423**	**9,153.8423**	**2.6364**	**0.0000**	**9,219.7531**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.98**	**0.00**	**47.35**	**54.49**	**0.00**	**43.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9420	4.0000e-005	4.5000e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.6300e-003	9.6300e-003	3.0000e-005		0.0103
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.2700e-003	0.0317	0.1039	3.2000e-004	0.0271	2.6000e-004	0.0274	7.2600e-003	2.4000e-004	7.5000e-003		32.7962	32.7962	1.4500e-003		32.8324
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.9513**	**0.0318**	**0.1084**	**3.2000e-004**	**0.0271**	**2.8000e-004**	**0.0274**	**7.2600e-003**	**2.6000e-004**	**7.5200e-003**		**32.8058**	**32.8058**	**1.4800e-003**	**0.0000**	**32.8427**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9420	4.0000e-005	4.5000e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.6300e-003	9.6300e-003	3.0000e-005		0.0103
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.2700e-003	0.0317	0.1039	3.2000e-004	0.0271	2.6000e-004	0.0274	7.2600e-003	2.4000e-004	7.5000e-003		32.7962	32.7962	1.4500e-003		32.8324
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.9513**	**0.0318**	**0.1084**	**3.2000e-004**	**0.0271**	**2.8000e-004**	**0.0274**	**7.2600e-003**	**2.6000e-004**	**7.5200e-003**		**32.8058**	**32.8058**	**1.4800e-003**	**0.0000**	**32.8427**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

City Sacramento Groundwater Master Plan EIR - Sacramento County, Summer

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Well Destruction/Demolition	Demolition	1/4/2021	1/7/2021	5	4	
2	Site Preparation	Site Preparation	1/8/2021	1/21/2021	5	10	
3	Mobilization	Building Construction	1/22/2021	1/25/2021	5	2	
4	Test Well Drilling	Building Construction	1/26/2021	2/22/2021	7	28	
5	Test Well Testing	Building Construction	2/23/2021	2/24/2021	5	2	
6	Production Well Drilling/Construction	Building Construction	2/25/2021	3/31/2021	7	35	
7	Production Well Development/Testing	Building Construction	4/1/2021	4/28/2021	5	20	
8	Demobilization	Building Construction	4/29/2021	4/30/2021	5	2	
9	Well Equipping Construction	Building Construction	5/3/2021	11/26/2021	5	150	
10	Site Paving/Landscaping	Paving	11/29/2021	12/10/2021	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Production Well Development/Testing	Welders	0	0.00	46	0.45
Demobilization	Welders	0	0.00	46	0.45
Well Equipping Construction	Welders	3	8.00	46	0.45
Well Destruction/Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Mobilization	Off-Highway Trucks	1	4.00	402	0.38
Test Well Drilling	Air Compressors	1	8.00	78	0.48

Test Well Drilling	Bore/Drill Rigs	1	24.00	221	0.50
Test Well Drilling	Off-Highway Trucks	4	8.00	402	0.38
Test Well Testing	Pumps	1	8.00	84	0.74
Test Well Testing	Off-Highway Trucks	1	8.00	402	0.38
Production Well Drilling/Construction	Bore/Drill Rigs	1	24.00	221	0.50
Production Well Drilling/Construction	Off-Highway Trucks	4	8.00	402	0.38
Production Well Drilling/Construction	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Off-Highway Trucks	1	8.00	402	0.38
Demobilization	Off-Highway Trucks	1	8.00	402	0.38
Well Equipping Construction	Air Compressors	1	8.00	78	0.48
Production Well Drilling/Construction	Air Compressors	1	6.00	78	0.48
Test Well Testing	Cement and Mortar Mixers	0	0.00	9	0.56
Well Destruction/Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Test Well Drilling	Generator Sets	0	0.00	84	0.74
Test Well Drilling	Cranes	0	0.00	231	0.29
Test Well Drilling	Forklifts	0	0.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Test Well Testing	Pavers	0	0.00	130	0.42
Test Well Testing	Rollers	0	0.00	80	0.38
Well Destruction/Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Mobilization	Rubber Tired Dozers	0	0.00	247	0.40
Test Well Drilling	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Destruction/Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Test Well Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Mobilization	Graders	0	0.00	187	0.41
Test Well Testing	Paving Equipment	0	0.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Test Well Drilling	Welders	1	8.00	46	0.45
Site Paving/Landscaping	Cement and Mortar Mixers	1	6.00	9	0.56
Mobilization	Cranes	0	0.00	231	0.29
Test Well Testing	Cranes	0	0.00	231	0.29
Production Well Drilling/Construction	Cranes	0	0.00	231	0.29
Production Well Development/Testing	Cranes	0	0.00	231	0.29
Demobilization	Cranes	0	0.00	231	0.29
Well Equipping Construction	Cranes	1	6.00	231	0.29
Mobilization	Forklifts	0	0.00	89	0.20
Test Well Testing	Forklifts	0	0.00	89	0.20
Production Well Drilling/Construction	Forklifts	0	0.00	89	0.20
Production Well Development/Testing	Forklifts	0	0.00	89	0.20
Demobilization	Forklifts	0	0.00	89	0.20
Well Equipping Construction	Forklifts	0	0.00	89	0.20
Mobilization	Generator Sets	0	0.00	84	0.74
Test Well Testing	Generator Sets	0	0.00	84	0.74
Production Well Drilling/Construction	Generator Sets	0	0.00	84	0.74
Production Well Development/Testing	Generator Sets	0	0.00	84	0.74
Demobilization	Generator Sets	0	0.00	84	0.74
Well Equipping Construction	Generator Sets	1	8.00	84	0.74
Site Paving/Landscaping	Pavers	1	6.00	130	0.42
Site Paving/Landscaping	Paving Equipment	1	8.00	132	0.36
Site Paving/Landscaping	Rollers	1	7.00	80	0.38
Production Well Drilling/Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Production Well Development/Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Demobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Equipping Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Paving/Landscaping	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Welders	0	0.00	46	0.45
Test Well Testing	Welders	0	0.00	46	0.45
Production Well Drilling/Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Destruction/Demolition	4	10.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	28.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	1	18.00	12.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Drilling	7	18.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Drilling/Construction	8	18.00	0.00	6.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Development/Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization	1	18.00	10.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Well Equipping Construction	7	18.00	2.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Paving/Landscaping	5	13.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Well Destruction/Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5388	0.0000	0.5388	0.0816	0.0000	0.0816			0.0000			0.0000
Off-Road	1.6772	16.2732	10.2804	0.0186		0.8317	0.8317		0.7801	0.7801		1,771.4332	1,771.4332	0.4046		1,781.5472
Total	**1.6772**	**16.2732**	**10.2804**	**0.0186**	**0.5388**	**0.8317**	**1.3705**	**0.0816**	**0.7801**	**0.8617**		**1,771.4332**	**1,771.4332**	**0.4046**		**1,781.5472**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5200e-003	0.1276	0.0294	3.9000e-004	8.7000e-003	4.5000e-004	9.1400e-003	2.3800e-003	4.3000e-004	2.8100e-003		41.9534	41.9534	2.3600e-003		42.0124
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0205	0.2992	7.7000e-004	0.0761	5.1000e-004	0.0766	0.0202	4.7000e-004	0.0207		76.6479	76.6479	2.0400e-003		76.6989
Total	**0.0436**	**0.1481**	**0.3285**	**1.1600e-003**	**0.0848**	**9.6000e-004**	**0.0857**	**0.0226**	**9.0000e-004**	**0.0235**		**118.6013**	**118.6013**	**4.4000e-003**		**118.7113**

3.2 Well Destruction/Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2425	0.0000	0.2425	0.0367	0.0000	0.0367			0.0000			0.0000
Off-Road	1.6772	16.2732	10.2804	0.0186		0.8317	0.8317		0.7801	0.7801	0.0000	1,771.4332	1,771.4332	0.4046		1,781.5472
Total	**1.6772**	**16.2732**	**10.2804**	**0.0186**	**0.2425**	**0.8317**	**1.0741**	**0.0367**	**0.7801**	**0.8168**	**0.0000**	**1,771.4332**	**1,771.4332**	**0.4046**		**1,781.5472**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5200e-003	0.1276	0.0294	3.9000e-004	8.3700e-003	4.5000e-004	8.8100e-003	2.3000e-003	4.3000e-004	2.7200e-003		41.9534	41.9534	2.3600e-003		42.0124
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0205	0.2992	7.7000e-004	0.0728	5.1000e-004	0.0733	0.0194	4.7000e-004	0.0198		76.6479	76.6479	2.0400e-003		76.6989
Total	**0.0436**	**0.1481**	**0.3285**	**1.1600e-003**	**0.0811**	**9.6000e-004**	**0.0821**	**0.0217**	**9.0000e-004**	**0.0226**		**118.6013**	**118.6013**	**4.4000e-003**		**118.7113**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3754	0.0000	5.3754	2.9079	0.0000	2.9079			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041		1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.3754**	**0.7654**	**6.1408**	**2.9079**	**0.7041**	**3.6120**		**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0197	0.7146	0.1644	2.1900e-003	0.0487	2.5000e-003	0.0512	0.0133	2.3900e-003	0.0157		234.9390	234.9390	0.0132		235.2694
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0321	0.0164	0.2393	6.2000e-004	0.0609	4.1000e-004	0.0613	0.0161	3.8000e-004	0.0165		61.3183	61.3183	1.6300e-003		61.3591
Total	**0.0518**	**0.7310**	**0.4037**	**2.8100e-003**	**0.1096**	**2.9100e-003**	**0.1125**	**0.0295**	**2.7700e-003**	**0.0322**		**296.2573**	**296.2573**	**0.0149**		**296.6285**

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4189	0.0000	2.4189	1.3086	0.0000	1.3086			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041	0.0000	1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**2.4189**	**0.7654**	**3.1843**	**1.3086**	**0.7041**	**2.0127**	**0.0000**	**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0197	0.7146	0.1644	2.1900e-003	0.0469	2.5000e-003	0.0493	0.0129	2.3900e-003	0.0153		234.9390	234.9390	0.0132		235.2694
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0321	0.0164	0.2393	6.2000e-004	0.0582	4.1000e-004	0.0586	0.0155	3.8000e-004	0.0159		61.3183	61.3183	1.6300e-003		61.3591
Total	**0.0518**	**0.7310**	**0.4037**	**2.8100e-003**	**0.1051**	**2.9100e-003**	**0.1080**	**0.0284**	**2.7700e-003**	**0.0311**		**296.2573**	**296.2573**	**0.0149**		**296.6285**

3.4 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3045	2.6448	1.8112	6.6400e-003		0.0970	0.0970		0.0893	0.0893		642.4578	642.4578	0.2078		647.6524
Total	**0.3045**	**2.6448**	**1.8112**	**6.6400e-003**		**0.0970**	**0.0970**		**0.0893**	**0.0893**		**642.4578**	**642.4578**	**0.2078**		**647.6524**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0371	1.2053	0.3078	2.9600e-003	0.0722	3.3100e-003	0.0755	0.0208	3.1600e-003	0.0239		313.7735	313.7735	0.0172		314.2022
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.1092**	**1.2422**	**0.8463**	**4.3500e-003**	**0.2091**	**4.2300e-003**	**0.2134**	**0.0571**	**4.0100e-003**	**0.0611**		**451.7397**	**451.7397**	**0.0208**		**452.2602**

3.4 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3045	2.6448	1.8112	6.6400e-003		0.0970	0.0970		0.0893	0.0893	0.0000	642.4578	642.4578	0.2078		647.6524
Total	**0.3045**	**2.6448**	**1.8112**	**6.6400e-003**		**0.0970**	**0.0970**		**0.0893**	**0.0893**	**0.0000**	**642.4578**	**642.4578**	**0.2078**		**647.6524**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0371	1.2053	0.3078	2.9600e-003	0.0696	3.3100e-003	0.0729	0.0202	3.1600e-003	0.0233		313.7735	313.7735	0.0172		314.2022
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.1092**	**1.2422**	**0.8463**	**4.3500e-003**	**0.2006**	**4.2300e-003**	**0.2048**	**0.0550**	**4.0100e-003**	**0.0590**		**451.7397**	**451.7397**	**0.0208**		**452.2602**

3.5 Test Well Drilling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8086	33.8171	24.8847	0.0880		1.2519	1.2519		1.1678	1.1678		8,472.2724	8,472.2724	2.6044		8,537.3825
Total	**3.8086**	**33.8171**	**24.8847**	**0.0880**		**1.2519**	**1.2519**		**1.1678**	**1.1678**		**8,472.2724**	**8,472.2724**	**2.6044**		**8,537.3825**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.0000e-004	0.0182	4.1900e-003	6.0000e-005	1.2400e-003	6.0000e-005	1.3100e-003	3.4000e-004	6.0000e-005	4.0000e-004		5.9933	5.9933	3.4000e-004		6.0018
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0726**	**0.0552**	**0.5427**	**1.4500e-003**	**0.1382**	**9.8000e-004**	**0.1392**	**0.0367**	**9.1000e-004**	**0.0376**		**143.9596**	**143.9596**	**4.0100e-003**		**144.0598**

3.5 Test Well Drilling - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8086	33.8171	24.8847	0.0880		1.2519	1.2519		1.1678	1.1678	0.0000	8,472.2724	8,472.2724	2.6044		8,537.3825
Total	**3.8086**	**33.8171**	**24.8847**	**0.0880**		**1.2519**	**1.2519**		**1.1678**	**1.1678**	**0.0000**	**8,472.2724**	**8,472.2724**	**2.6044**		**8,537.3825**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.0000e-004	0.0182	4.1900e-003	6.0000e-005	1.2000e-003	6.0000e-005	1.2600e-003	3.3000e-004	6.0000e-005	3.9000e-004		5.9933	5.9933	3.4000e-004		6.0018
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0726**	**0.0552**	**0.5427**	**1.4500e-003**	**0.1322**	**9.8000e-004**	**0.1332**	**0.0352**	**9.1000e-004**	**0.0361**		**143.9596**	**143.9596**	**4.0100e-003**		**144.0598**

3.6 Test Well Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561		1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**		**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0721**	**0.0369**	**0.5385**	**1.3900e-003**	**0.1369**	**9.2000e-004**	**0.1379**	**0.0363**	**8.5000e-004**	**0.0372**		**137.9662**	**137.9662**	**3.6700e-003**		**138.0580**

3.6 Test Well Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561	0.0000	1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**	**0.0000**	**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0721**	**0.0369**	**0.5385**	**1.3900e-003**	**0.1310**	**9.2000e-004**	**0.1319**	**0.0349**	**8.5000e-004**	**0.0357**		**137.9662**	**137.9662**	**3.6700e-003**		**138.0580**

3.7 Production Well Drilling/Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.1161	36.5181	28.0195	0.0936		1.3982	1.3982		1.3140	1.3140		9,001.4921	9,001.4921	2.6320		9,067.2908
Total	**4.1161**	**36.5181**	**28.0195**	**0.0936**		**1.3982**	**1.3982**		**1.3140**	**1.3140**		**9,001.4921**	**9,001.4921**	**2.6320**		**9,067.2908**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.2100e-003	0.0438	0.0101	1.3000e-004	2.9800e-003	1.5000e-004	3.1300e-003	8.2000e-004	1.5000e-004	9.6000e-004		14.3840	14.3840	8.1000e-004		14.4043
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0734**	**0.0807**	**0.5486**	**1.5200e-003**	**0.1399**	**1.0700e-003**	**0.1410**	**0.0371**	**1.0000e-003**	**0.0381**		**152.3503**	**152.3503**	**4.4800e-003**		**152.4623**

3.7 Production Well Drilling/Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.1161	36.5181	28.0195	0.0936		1.3982	1.3982		1.3140	1.3140	0.0000	9,001.4920	9,001.4920	2.6320		9,067.2908
Total	**4.1161**	**36.5181**	**28.0195**	**0.0936**		**1.3982**	**1.3982**		**1.3140**	**1.3140**	**0.0000**	**9,001.4920**	**9,001.4920**	**2.6320**		**9,067.2908**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.2100e-003	0.0438	0.0101	1.3000e-004	2.8700e-003	1.5000e-004	3.0200e-003	7.9000e-004	1.5000e-004	9.3000e-004		14.3840	14.3840	8.1000e-004		14.4043
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0734**	**0.0807**	**0.5486**	**1.5200e-003**	**0.1339**	**1.0700e-003**	**0.1349**	**0.0357**	**1.0000e-003**	**0.0366**		**152.3503**	**152.3503**	**4.4800e-003**		**152.4623**

3.8 Production Well Development/Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561		1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**		**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0721**	**0.0369**	**0.5385**	**1.3900e-003**	**0.1369**	**9.2000e-004**	**0.1379**	**0.0363**	**8.5000e-004**	**0.0372**		**137.9662**	**137.9662**	**3.6700e-003**		**138.0580**

3.8 Production Well Development/Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561	0.0000	1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**	**0.0000**	**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0721**	**0.0369**	**0.5385**	**1.3900e-003**	**0.1310**	**9.2000e-004**	**0.1319**	**0.0349**	**8.5000e-004**	**0.0357**		**137.9662**	**137.9662**	**3.6700e-003**		**138.0580**

3.9 Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6089	5.2897	3.6224	0.0133		0.1940	0.1940		0.1785	0.1785		1,284.9156	1,284.9156	0.4156		1,295.3048
Total	**0.6089**	**5.2897**	**3.6224**	**0.0133**		**0.1940**	**0.1940**		**0.1785**	**0.1785**		**1,284.9156**	**1,284.9156**	**0.4156**		**1,295.3048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0309	1.0044	0.2565	2.4700e-003	0.0602	2.7500e-003	0.0629	0.0173	2.6300e-003	0.0200		261.4779	261.4779	0.0143		261.8352
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.1030**	**1.0413**	**0.7950**	**3.8600e-003**	**0.1971**	**3.6700e-003**	**0.2008**	**0.0536**	**3.4800e-003**	**0.0571**		**399.4441**	**399.4441**	**0.0180**		**399.8932**

3.9 Demobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6089	5.2897	3.6224	0.0133		0.1940	0.1940		0.1785	0.1785	0.0000	1,284.9156	1,284.9156	0.4156		1,295.3048
Total	**0.6089**	**5.2897**	**3.6224**	**0.0133**		**0.1940**	**0.1940**		**0.1785**	**0.1785**	**0.0000**	**1,284.9156**	**1,284.9156**	**0.4156**		**1,295.3048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0309	1.0044	0.2565	2.4700e-003	0.0580	2.7500e-003	0.0608	0.0168	2.6300e-003	0.0194		261.4779	261.4779	0.0143		261.8352
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.1030**	**1.0413**	**0.7950**	**3.8600e-003**	**0.1890**	**3.6700e-003**	**0.1927**	**0.0517**	**3.4800e-003**	**0.0551**		**399.4441**	**399.4441**	**0.0180**		**399.8932**

3.10 Well Equipping Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0074	14.7875	14.4469	0.0249		0.7470	0.7470		0.7285	0.7285		2,265.4610	2,265.4610	0.3471		2,274.1388
Total	**2.0074**	**14.7875**	**14.4469**	**0.0249**		**0.7470**	**0.7470**		**0.7285**	**0.7285**		**2,265.4610**	**2,265.4610**	**0.3471**		**2,274.1388**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.0000e-005	3.4000e-003	7.8000e-004	1.0000e-005	2.3000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	7.0000e-005		1.1188	1.1188	6.0000e-005		1.1203
Vendor	6.1800e-003	0.2009	0.0513	4.9000e-004	0.0120	5.5000e-004	0.0126	3.4600e-003	5.3000e-004	3.9900e-003		52.2956	52.2956	2.8600e-003		52.3670
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0784**	**0.2412**	**0.5906**	**1.8900e-003**	**0.1492**	**1.4800e-003**	**0.1507**	**0.0398**	**1.3900e-003**	**0.0412**		**191.3806**	**191.3806**	**6.5900e-003**		**191.5454**

3.10 Well Equipping Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0074	14.7875	14.4469	0.0249		0.7470	0.7470		0.7285	0.7285	0.0000	2,265.4609	2,265.4609	0.3471		2,274.1388
Total	**2.0074**	**14.7875**	**14.4469**	**0.0249**		**0.7470**	**0.7470**		**0.7285**	**0.7285**	**0.0000**	**2,265.4609**	**2,265.4609**	**0.3471**		**2,274.1388**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.0000e-005	3.4000e-003	7.8000e-004	1.0000e-005	2.2000e-004	1.0000e-005	2.3000e-004	6.0000e-005	1.0000e-005	7.0000e-005		1.1188	1.1188	6.0000e-005		1.1203
Vendor	6.1800e-003	0.2009	0.0513	4.9000e-004	0.0116	5.5000e-004	0.0122	3.3600e-003	5.3000e-004	3.8800e-003		52.2956	52.2956	2.8600e-003		52.3670
Worker	0.0721	0.0369	0.5385	1.3900e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		137.9662	137.9662	3.6700e-003		138.0580
Total	**0.0784**	**0.2412**	**0.5906**	**1.8900e-003**	**0.1428**	**1.4800e-003**	**0.1443**	**0.0383**	**1.3900e-003**	**0.0397**		**191.3806**	**191.3806**	**6.5900e-003**		**191.5454**

3.11 Site Paving/Landscaping - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7739	7.7422	8.8569	0.0135		0.4153	0.4153		0.3830	0.3830		1,296.8664	1,296.8664	0.4111		1,307.1442
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7739**	**7.7422**	**8.8569**	**0.0135**		**0.4153**	**0.4153**		**0.3830**	**0.3830**		**1,296.8664**	**1,296.8664**	**0.4111**		**1,307.1442**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0267	0.3889	1.0000e-003	0.0989	6.7000e-004	0.0996	0.0262	6.2000e-004	0.0269		99.6423	99.6423	2.6500e-003		99.7086
Total	**0.0521**	**0.0267**	**0.3889**	**1.0000e-003**	**0.0989**	**6.7000e-004**	**0.0996**	**0.0262**	**6.2000e-004**	**0.0269**		**99.6423**	**99.6423**	**2.6500e-003**		**99.7086**

3.11 Site Paving/Landscaping - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7739	7.7422	8.8569	0.0135		0.4153	0.4153		0.3830	0.3830	0.0000	1,296.8664	1,296.8664	0.4111		1,307.1442
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7739**	**7.7422**	**8.8569**	**0.0135**		**0.4153**	**0.4153**		**0.3830**	**0.3830**	**0.0000**	**1,296.8664**	**1,296.8664**	**0.4111**		**1,307.1442**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0521	0.0267	0.3889	1.0000e-003	0.0946	6.7000e-004	0.0953	0.0252	6.2000e-004	0.0258		99.6423	99.6423	2.6500e-003		99.7086
Total	**0.0521**	**0.0267**	**0.3889**	**1.0000e-003**	**0.0946**	**6.7000e-004**	**0.0953**	**0.0252**	**6.2000e-004**	**0.0258**		**99.6423**	**99.6423**	**2.6500e-003**		**99.7086**

4.0 Operational Detail - Mobile

City Sacramento Groundwater Master Plan EIR

Sacramento County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Refrigerated Warehouse-No Rail	44.00	1000sqft	1.01	44,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.5	**Precipitation Freq (Days)**	58
Climate Zone	6			**Operational Year**	2022
Utility Company	Sacramento Municipal Utility District				
CO2 Intensity (lb/MWhr)	590.31	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - project specific info

Off-road Equipment - project specific info

Off-road Equipment -

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info.

Off-road Equipment - project specific info

Off-road Equipment - project specific info

Off-road Equipment - project info

Off-road Equipment -

Demolition -

Trips and VMT - project info

Vehicle Trips - project info

Area Coating - project info

Energy Use - project info

Water And Wastewater - project info

Solid Waste - project info

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - SMAQMD basic dust control

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	22000	0
tblAreaCoating	Area_Nonresidential_Interior	66000	0
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	5

City Sacramento Groundwater Master Plan EIR - Sacramento County, Winter

tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	200.00	35.00
tblConstructionPhase	NumDays	200.00	28.00
tblConstructionPhase	NumDays	20.00	4.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	2.00
tblConstructionPhase	NumDays	200.00	150.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	12/13/2021	3/31/2021
tblConstructionPhase	PhaseEndDate	11/15/2021	2/22/2021
tblConstructionPhase	PhaseEndDate	1/29/2021	1/7/2021
tblConstructionPhase	PhaseEndDate	2/8/2021	1/25/2021
tblConstructionPhase	PhaseEndDate	11/29/2021	2/24/2021
tblConstructionPhase	PhaseEndDate	2/2/2021	1/21/2021
tblConstructionPhase	PhaseStartDate	11/30/2021	2/25/2021
tblConstructionPhase	PhaseStartDate	2/9/2021	1/26/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	1/22/2021
tblConstructionPhase	PhaseStartDate	11/16/2021	2/23/2021
tblConstructionPhase	PhaseStartDate	1/30/2021	1/8/2021
tblEnergyUse	LightingElect	1.85	0.00
tblEnergyUse	NT24E	13.70	5.83
tblEnergyUse	NT24NG	0.63	0.00
tblEnergyUse	T24E	0.46	0.00

tblEnergyUse	T24NG	0.83	0.00
tblGrading	AcresOfGrading	5.00	1.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

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tblOffRoadEquipment	UsageHours	6.00	0.00

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tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	41.36	0.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	115.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	40.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	HaulingTripNumber	10.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	28.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	HaulingTripNumber	0.00	6.00
tblTripsAndVMT	HaulingTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	7.00	12.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
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tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	10.00
tblTripsAndVMT	VendorTripNumber	7.00	2.00
tblVehicleTrips	ST_TR	1.68	0.10
tblVehicleTrips	SU_TR	1.68	0.10
tblVehicleTrips	WD_TR	1.68	0.10
tblWater	IndoorWaterUseRate	10,175,000.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.1837	36.6092	28.4896	0.0950	5.4849	1.3993	6.2533	2.9374	1.3150	3.6444	0.0000	9,136.8227	9,136.8227	2.6360	0.0000	9,202.7234
Maximum	**4.1837**	**36.6092**	**28.4896**	**0.0950**	**5.4849**	**1.3993**	**6.2533**	**2.9374**	**1.3150**	**3.6444**	**0.0000**	**9,136.8227**	**9,136.8227**	**2.6360**	**0.0000**	**9,202.7234**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.1837	36.6092	28.4896	0.0950	2.5240	1.3993	3.2923	1.3369	1.3150	2.0439	0.0000	9,136.8227	9,136.8227	2.6360	0.0000	9,202.7234
Maximum	**4.1837**	**36.6092**	**28.4896**	**0.0950**	**2.5240**	**1.3993**	**3.2923**	**1.3369**	**1.3150**	**2.0439**	**0.0000**	**9,136.8227**	**9,136.8227**	**2.6360**	**0.0000**	**9,202.7234**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.98**	**0.00**	**47.35**	**54.49**	**0.00**	**43.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9420	4.0000e-005	4.5000e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.6300e-003	9.6300e-003	3.0000e-005		0.0103
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.0200e-003	0.0341	0.0943	2.9000e-004	0.0271	2.6000e-004	0.0274	7.2600e-003	2.5000e-004	7.5000e-003		29.6328	29.6328	1.4300e-003		29.6685
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.9490**	**0.0342**	**0.0988**	**2.9000e-004**	**0.0271**	**2.8000e-004**	**0.0274**	**7.2600e-003**	**2.7000e-004**	**7.5200e-003**		**29.6424**	**29.6424**	**1.4600e-003**	**0.0000**	**29.6787**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9420	4.0000e-005	4.5000e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.6300e-003	9.6300e-003	3.0000e-005		0.0103
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.0200e-003	0.0341	0.0943	2.9000e-004	0.0271	2.6000e-004	0.0274	7.2600e-003	2.5000e-004	7.5000e-003		29.6328	29.6328	1.4300e-003		29.6685
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.9490**	**0.0342**	**0.0988**	**2.9000e-004**	**0.0271**	**2.8000e-004**	**0.0274**	**7.2600e-003**	**2.7000e-004**	**7.5200e-003**		**29.6424**	**29.6424**	**1.4600e-003**	**0.0000**	**29.6787**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

City Sacramento Groundwater Master Plan EIR - Sacramento County, Winter

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Well Destruction/Demolition	Demolition	1/4/2021	1/7/2021	5	4	
2	Site Preparation	Site Preparation	1/8/2021	1/21/2021	5	10	
3	Mobilization	Building Construction	1/22/2021	1/25/2021	5	2	
4	Test Well Drilling	Building Construction	1/26/2021	2/22/2021	7	28	
5	Test Well Testing	Building Construction	2/23/2021	2/24/2021	5	2	
6	Production Well Drilling/Construction	Building Construction	2/25/2021	3/31/2021	7	35	
7	Production Well Development/Testing	Building Construction	4/1/2021	4/28/2021	5	20	
8	Demobilization	Building Construction	4/29/2021	4/30/2021	5	2	
9	Well Equipping Construction	Building Construction	5/3/2021	11/26/2021	5	150	
10	Site Paving/Landscaping	Paving	11/29/2021	12/10/2021	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Production Well Development/Testing	Welders	0	0.00	46	0.45
Demobilization	Welders	0	0.00	46	0.45
Well Equipping Construction	Welders	3	8.00	46	0.45
Well Destruction/Demolition	Cement and Mortar Mixers	1	8.00	9	0.56
Mobilization	Off-Highway Trucks	1	4.00	402	0.38
Test Well Drilling	Air Compressors	1	8.00	78	0.48

Test Well Drilling	Bore/Drill Rigs	1	24.00	221	0.50
Test Well Drilling	Off-Highway Trucks	4	8.00	402	0.38
Test Well Testing	Pumps	1	8.00	84	0.74
Test Well Testing	Off-Highway Trucks	1	8.00	402	0.38
Production Well Drilling/Construction	Bore/Drill Rigs	1	24.00	221	0.50
Production Well Drilling/Construction	Off-Highway Trucks	4	8.00	402	0.38
Production Well Drilling/Construction	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Pumps	1	8.00	84	0.74
Production Well Development/Testing	Off-Highway Trucks	1	8.00	402	0.38
Demobilization	Off-Highway Trucks	1	8.00	402	0.38
Well Equipping Construction	Air Compressors	1	8.00	78	0.48
Production Well Drilling/Construction	Air Compressors	1	6.00	78	0.48
Test Well Testing	Cement and Mortar Mixers	0	0.00	9	0.56
Well Destruction/Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Test Well Drilling	Generator Sets	0	0.00	84	0.74
Test Well Drilling	Cranes	0	0.00	231	0.29
Test Well Drilling	Forklifts	0	0.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Test Well Testing	Pavers	0	0.00	130	0.42
Test Well Testing	Rollers	0	0.00	80	0.38
Well Destruction/Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Mobilization	Rubber Tired Dozers	0	0.00	247	0.40
Test Well Drilling	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Destruction/Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Test Well Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Mobilization	Graders	0	0.00	187	0.41
Test Well Testing	Paving Equipment	0	0.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Test Well Drilling	Welders	1	8.00	46	0.45
Site Paving/Landscaping	Cement and Mortar Mixers	1	6.00	9	0.56
Mobilization	Cranes	0	0.00	231	0.29
Test Well Testing	Cranes	0	0.00	231	0.29
Production Well Drilling/Construction	Cranes	0	0.00	231	0.29
Production Well Development/Testing	Cranes	0	0.00	231	0.29
Demobilization	Cranes	0	0.00	231	0.29
Well Equipping Construction	Cranes	1	6.00	231	0.29
Mobilization	Forklifts	0	0.00	89	0.20
Test Well Testing	Forklifts	0	0.00	89	0.20
Production Well Drilling/Construction	Forklifts	0	0.00	89	0.20
Production Well Development/Testing	Forklifts	0	0.00	89	0.20
Demobilization	Forklifts	0	0.00	89	0.20
Well Equipping Construction	Forklifts	0	0.00	89	0.20
Mobilization	Generator Sets	0	0.00	84	0.74
Test Well Testing	Generator Sets	0	0.00	84	0.74
Production Well Drilling/Construction	Generator Sets	0	0.00	84	0.74
Production Well Development/Testing	Generator Sets	0	0.00	84	0.74
Demobilization	Generator Sets	0	0.00	84	0.74
Well Equipping Construction	Generator Sets	1	8.00	84	0.74
Site Paving/Landscaping	Pavers	1	6.00	130	0.42
Site Paving/Landscaping	Paving Equipment	1	8.00	132	0.36
Site Paving/Landscaping	Rollers	1	7.00	80	0.38
Production Well Drilling/Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Production Well Development/Testing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Demobilization	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Well Equipping Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Site Paving/Landscaping	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Welders	0	0.00	46	0.45
Test Well Testing	Welders	0	0.00	46	0.45
Production Well Drilling/Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Destruction/Demolition	4	10.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	28.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	1	18.00	12.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Drilling	7	18.00	0.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Test Well Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Drilling/Construction	8	18.00	0.00	6.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Production Well Development/Testing	2	18.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization	1	18.00	10.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Well Equipping Construction	7	18.00	2.00	2.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT
Site Paving/Landscaping	5	13.00	0.00	0.00	10.00	6.50	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Well Destruction/Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5388	0.0000	0.5388	0.0816	0.0000	0.0816			0.0000			0.0000
Off-Road	1.6772	16.2732	10.2804	0.0186		0.8317	0.8317		0.7801	0.7801		1,771.4332	1,771.4332	0.4046		1,781.5472
Total	**1.6772**	**16.2732**	**10.2804**	**0.0186**	**0.5388**	**0.8317**	**1.3705**	**0.0816**	**0.7801**	**0.8617**		**1,771.4332**	**1,771.4332**	**0.4046**		**1,781.5472**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.6300e-003	0.1325	0.0314	3.9000e-004	8.7000e-003	4.6000e-004	9.1600e-003	2.3800e-003	4.4000e-004	2.8200e-003		41.3032	41.3032	2.4700e-003		41.3649
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0369	0.0253	0.2552	6.8000e-004	0.0761	5.1000e-004	0.0766	0.0202	4.7000e-004	0.0207		67.3164	67.3164	1.7900e-003		67.3613
Total	**0.0405**	**0.1579**	**0.2865**	**1.0700e-003**	**0.0848**	**9.7000e-004**	**0.0857**	**0.0226**	**9.1000e-004**	**0.0235**		**108.6197**	**108.6197**	**4.2600e-003**		**108.7262**

3.2 Well Destruction/Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2425	0.0000	0.2425	0.0367	0.0000	0.0367			0.0000			0.0000
Off-Road	1.6772	16.2732	10.2804	0.0186		0.8317	0.8317		0.7801	0.7801	0.0000	1,771.4332	1,771.4332	0.4046		1,781.5472
Total	**1.6772**	**16.2732**	**10.2804**	**0.0186**	**0.2425**	**0.8317**	**1.0741**	**0.0367**	**0.7801**	**0.8168**	**0.0000**	**1,771.4332**	**1,771.4332**	**0.4046**		**1,781.5472**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.6300e-003	0.1325	0.0314	3.9000e-004	8.3700e-003	4.6000e-004	8.8300e-003	2.3000e-003	4.4000e-004	2.7400e-003		41.3032	41.3032	2.4700e-003		41.3649
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0369	0.0253	0.2552	6.8000e-004	0.0728	5.1000e-004	0.0733	0.0194	4.7000e-004	0.0198		67.3164	67.3164	1.7900e-003		67.3613
Total	**0.0405**	**0.1579**	**0.2865**	**1.0700e-003**	**0.0811**	**9.7000e-004**	**0.0821**	**0.0217**	**9.1000e-004**	**0.0226**		**108.6197**	**108.6197**	**4.2600e-003**		**108.7262**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3754	0.0000	5.3754	2.9079	0.0000	2.9079			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041		1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.3754**	**0.7654**	**6.1408**	**2.9079**	**0.7041**	**3.6120**		**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0203	0.7421	0.1757	2.1600e-003	0.0487	2.5800e-003	0.0513	0.0133	2.4700e-003	0.0158		231.2981	231.2981	0.0138		231.6435
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0295	0.0203	0.2041	5.4000e-004	0.0609	4.1000e-004	0.0613	0.0161	3.8000e-004	0.0165		53.8531	53.8531	1.4400e-003		53.8890
Total	**0.0498**	**0.7624**	**0.3799**	**2.7000e-003**	**0.1096**	**2.9900e-003**	**0.1126**	**0.0295**	**2.8500e-003**	**0.0323**		**285.1512**	**285.1512**	**0.0153**		**285.5325**

3.3 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4189	0.0000	2.4189	1.3086	0.0000	1.3086			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041	0.0000	1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**2.4189**	**0.7654**	**3.1843**	**1.3086**	**0.7041**	**2.0127**	**0.0000**	**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0203	0.7421	0.1757	2.1600e-003	0.0469	2.5800e-003	0.0494	0.0129	2.4700e-003	0.0153		231.2981	231.2981	0.0138		231.6435
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0295	0.0203	0.2041	5.4000e-004	0.0582	4.1000e-004	0.0586	0.0155	3.8000e-004	0.0159		53.8531	53.8531	1.4400e-003		53.8890
Total	**0.0498**	**0.7624**	**0.3799**	**2.7000e-003**	**0.1051**	**2.9900e-003**	**0.1081**	**0.0284**	**2.8500e-003**	**0.0312**		**285.1512**	**285.1512**	**0.0153**		**285.5325**

3.4 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3045	2.6448	1.8112	6.6400e-003		0.0970	0.0970		0.0893	0.0893		642.4578	642.4578	0.2078		647.6524
Total	**0.3045**	**2.6448**	**1.8112**	**6.6400e-003**		**0.0970**	**0.0970**		**0.0893**	**0.0893**		**642.4578**	**642.4578**	**0.2078**		**647.6524**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0393	1.2251	0.3570	2.8900e-003	0.0722	3.5100e-003	0.0757	0.0208	3.3600e-003	0.0241		305.7025	305.7025	0.0186		306.1668
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.1057**	**1.2707**	**0.8162**	**4.1100e-003**	**0.2091**	**4.4300e-003**	**0.2136**	**0.0571**	**4.2100e-003**	**0.0613**		**426.8720**	**426.8720**	**0.0218**		**427.4171**

3.4 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3045	2.6448	1.8112	6.6400e-003		0.0970	0.0970		0.0893	0.0893	0.0000	642.4578	642.4578	0.2078		647.6524
Total	**0.3045**	**2.6448**	**1.8112**	**6.6400e-003**		**0.0970**	**0.0970**		**0.0893**	**0.0893**	**0.0000**	**642.4578**	**642.4578**	**0.2078**		**647.6524**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0393	1.2251	0.3570	2.8900e-003	0.0696	3.5100e-003	0.0731	0.0202	3.3600e-003	0.0235		305.7025	305.7025	0.0186		306.1668
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.1057**	**1.2707**	**0.8162**	**4.1100e-003**	**0.2006**	**4.4300e-003**	**0.2050**	**0.0550**	**4.2100e-003**	**0.0592**		**426.8720**	**426.8720**	**0.0218**		**427.4171**

3.5 Test Well Drilling - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8086	33.8171	24.8847	0.0880		1.2519	1.2519		1.1678	1.1678		8,472.2724	8,472.2724	2.6044		8,537.3825
Total	**3.8086**	**33.8171**	**24.8847**	**0.0880**		**1.2519**	**1.2519**		**1.1678**	**1.1678**		**8,472.2724**	**8,472.2724**	**2.6044**		**8,537.3825**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.2000e-004	0.0189	4.4800e-003	6.0000e-005	1.2400e-003	7.0000e-005	1.3100e-003	3.4000e-004	6.0000e-005	4.0000e-004		5.9005	5.9005	3.5000e-004		5.9093
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0670**	**0.0645**	**0.4638**	**1.2800e-003**	**0.1382**	**9.9000e-004**	**0.1392**	**0.0367**	**9.1000e-004**	**0.0376**		**127.0700**	**127.0700**	**3.5800e-003**		**127.1596**

3.5 Test Well Drilling - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8086	33.8171	24.8847	0.0880		1.2519	1.2519		1.1678	1.1678	0.0000	8,472.2724	8,472.2724	2.6044		8,537.3825
Total	**3.8086**	**33.8171**	**24.8847**	**0.0880**		**1.2519**	**1.2519**		**1.1678**	**1.1678**	**0.0000**	**8,472.2724**	**8,472.2724**	**2.6044**		**8,537.3825**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	5.2000e-004	0.0189	4.4800e-003	6.0000e-005	1.2000e-003	7.0000e-005	1.2600e-003	3.3000e-004	6.0000e-005	3.9000e-004		5.9005	5.9005	3.5000e-004		5.9093
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0670**	**0.0645**	**0.4638**	**1.2800e-003**	**0.1322**	**9.9000e-004**	**0.1332**	**0.0352**	**9.1000e-004**	**0.0361**		**127.0700**	**127.0700**	**3.5800e-003**		**127.1596**

3.6 Test Well Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561		1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**		**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0664**	**0.0456**	**0.4593**	**1.2200e-003**	**0.1369**	**9.2000e-004**	**0.1379**	**0.0363**	**8.5000e-004**	**0.0372**		**121.1696**	**121.1696**	**3.2300e-003**		**121.2503**

3.6 Test Well Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561	0.0000	1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**	**0.0000**	**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0664**	**0.0456**	**0.4593**	**1.2200e-003**	**0.1310**	**9.2000e-004**	**0.1319**	**0.0349**	**8.5000e-004**	**0.0357**		**121.1696**	**121.1696**	**3.2300e-003**		**121.2503**

3.7 Production Well Drilling/Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.1161	36.5181	28.0195	0.0936		1.3982	1.3982		1.3140	1.3140		9,001.4921	9,001.4921	2.6320		9,067.2908
Total	**4.1161**	**36.5181**	**28.0195**	**0.0936**		**1.3982**	**1.3982**		**1.3140**	**1.3140**		**9,001.4921**	**9,001.4921**	**2.6320**		**9,067.2908**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.2400e-003	0.0454	0.0108	1.3000e-004	2.9800e-003	1.6000e-004	3.1400e-003	8.2000e-004	1.5000e-004	9.7000e-004		14.1611	14.1611	8.5000e-004		14.1823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0677**	**0.0911**	**0.4701**	**1.3500e-003**	**0.1399**	**1.0800e-003**	**0.1410**	**0.0371**	**1.0000e-003**	**0.0381**		**135.3307**	**135.3307**	**4.0800e-003**		**135.4325**

3.7 Production Well Drilling/Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.1161	36.5181	28.0195	0.0936		1.3982	1.3982		1.3140	1.3140	0.0000	9,001.4920	9,001.4920	2.6320		9,067.2908
Total	**4.1161**	**36.5181**	**28.0195**	**0.0936**		**1.3982**	**1.3982**		**1.3140**	**1.3140**	**0.0000**	**9,001.4920**	**9,001.4920**	**2.6320**		**9,067.2908**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.2400e-003	0.0454	0.0108	1.3000e-004	2.8700e-003	1.6000e-004	3.0300e-003	7.9000e-004	1.5000e-004	9.4000e-004		14.1611	14.1611	8.5000e-004		14.1823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0677**	**0.0911**	**0.4701**	**1.3500e-003**	**0.1339**	**1.0800e-003**	**0.1349**	**0.0357**	**1.0000e-003**	**0.0367**		**135.3307**	**135.3307**	**4.0800e-003**		**135.4325**

3.8 Production Well Development/Testing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561		1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**		**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0664**	**0.0456**	**0.4593**	**1.2200e-003**	**0.1369**	**9.2000e-004**	**0.1379**	**0.0363**	**8.5000e-004**	**0.0372**		**121.1696**	**121.1696**	**3.2300e-003**		**121.2503**

3.8 Production Well Development/Testing - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9894	8.4997	7.3630	0.0199		0.3716	0.3716		0.3561	0.3561	0.0000	1,907.9513	1,907.9513	0.4496		1,919.1901
Total	**0.9894**	**8.4997**	**7.3630**	**0.0199**		**0.3716**	**0.3716**		**0.3561**	**0.3561**	**0.0000**	**1,907.9513**	**1,907.9513**	**0.4496**		**1,919.1901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0664**	**0.0456**	**0.4593**	**1.2200e-003**	**0.1310**	**9.2000e-004**	**0.1319**	**0.0349**	**8.5000e-004**	**0.0357**		**121.1696**	**121.1696**	**3.2300e-003**		**121.2503**

3.9 Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6089	5.2897	3.6224	0.0133		0.1940	0.1940		0.1785	0.1785		1,284.9156	1,284.9156	0.4156		1,295.3048
Total	**0.6089**	**5.2897**	**3.6224**	**0.0133**		**0.1940**	**0.1940**		**0.1785**	**0.1785**		**1,284.9156**	**1,284.9156**	**0.4156**		**1,295.3048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0327	1.0209	0.2975	2.4100e-003	0.0602	2.9300e-003	0.0631	0.0173	2.8000e-003	0.0201		254.7521	254.7521	0.0155		255.1390
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0992**	**1.0665**	**0.7567**	**3.6300e-003**	**0.1971**	**3.8500e-003**	**0.2010**	**0.0536**	**3.6500e-003**	**0.0573**		**375.9216**	**375.9216**	**0.0187**		**376.3893**

3.9 Demobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6089	5.2897	3.6224	0.0133		0.1940	0.1940		0.1785	0.1785	0.0000	1,284.9156	1,284.9156	0.4156		1,295.3048
Total	**0.6089**	**5.2897**	**3.6224**	**0.0133**		**0.1940**	**0.1940**		**0.1785**	**0.1785**	**0.0000**	**1,284.9156**	**1,284.9156**	**0.4156**		**1,295.3048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0327	1.0209	0.2975	2.4100e-003	0.0580	2.9300e-003	0.0610	0.0168	2.8000e-003	0.0196		254.7521	254.7521	0.0155		255.1390
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0992**	**1.0665**	**0.7567**	**3.6300e-003**	**0.1890**	**3.8500e-003**	**0.1929**	**0.0517**	**3.6500e-003**	**0.0553**		**375.9216**	**375.9216**	**0.0187**		**376.3893**

3.10 Well Equipping Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0074	14.7875	14.4469	0.0249		0.7470	0.7470		0.7285	0.7285		2,265.4610	2,265.4610	0.3471		2,274.1388
Total	**2.0074**	**14.7875**	**14.4469**	**0.0249**		**0.7470**	**0.7470**		**0.7285**	**0.7285**		**2,265.4610**	**2,265.4610**	**0.3471**		**2,274.1388**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0000e-004	3.5300e-003	8.4000e-004	1.0000e-005	2.3000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	8.0000e-005		1.1014	1.1014	7.0000e-005		1.1031
Vendor	6.5500e-003	0.2042	0.0595	4.8000e-004	0.0120	5.9000e-004	0.0126	3.4600e-003	5.6000e-004	4.0200e-003		50.9504	50.9504	3.1000e-003		51.0278
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1369	9.2000e-004	0.1379	0.0363	8.5000e-004	0.0372		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0731**	**0.2533**	**0.5196**	**1.7100e-003**	**0.1492**	**1.5200e-003**	**0.1507**	**0.0398**	**1.4200e-003**	**0.0413**		**173.2214**	**173.2214**	**6.4000e-003**		**173.3811**

3.10 Well Equipping Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0074	14.7875	14.4469	0.0249		0.7470	0.7470		0.7285	0.7285	0.0000	2,265.4609	2,265.4609	0.3471		2,274.1388
Total	**2.0074**	**14.7875**	**14.4469**	**0.0249**		**0.7470**	**0.7470**		**0.7285**	**0.7285**	**0.0000**	**2,265.4609**	**2,265.4609**	**0.3471**		**2,274.1388**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0000e-004	3.5300e-003	8.4000e-004	1.0000e-005	2.2000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	7.0000e-005		1.1014	1.1014	7.0000e-005		1.1031
Vendor	6.5500e-003	0.2042	0.0595	4.8000e-004	0.0116	5.9000e-004	0.0122	3.3600e-003	5.6000e-004	3.9200e-003		50.9504	50.9504	3.1000e-003		51.0278
Worker	0.0664	0.0456	0.4593	1.2200e-003	0.1310	9.2000e-004	0.1319	0.0349	8.5000e-004	0.0357		121.1696	121.1696	3.2300e-003		121.2503
Total	**0.0731**	**0.2533**	**0.5196**	**1.7100e-003**	**0.1428**	**1.5200e-003**	**0.1443**	**0.0383**	**1.4200e-003**	**0.0397**		**173.2214**	**173.2214**	**6.4000e-003**		**173.3811**

3.11 Site Paving/Landscaping - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7739	7.7422	8.8569	0.0135		0.4153	0.4153		0.3830	0.3830		1,296.8664	1,296.8664	0.4111		1,307.1442
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7739**	**7.7422**	**8.8569**	**0.0135**		**0.4153**	**0.4153**		**0.3830**	**0.3830**		**1,296.8664**	**1,296.8664**	**0.4111**		**1,307.1442**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0480	0.0329	0.3317	8.8000e-004	0.0989	6.7000e-004	0.0996	0.0262	6.2000e-004	0.0269		87.5114	87.5114	2.3300e-003		87.5697
Total	**0.0480**	**0.0329**	**0.3317**	**8.8000e-004**	**0.0989**	**6.7000e-004**	**0.0996**	**0.0262**	**6.2000e-004**	**0.0269**		**87.5114**	**87.5114**	**2.3300e-003**		**87.5697**

3.11 Site Paving/Landscaping - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7739	7.7422	8.8569	0.0135		0.4153	0.4153		0.3830	0.3830	0.0000	1,296.8664	1,296.8664	0.4111		1,307.1442
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7739**	**7.7422**	**8.8569**	**0.0135**		**0.4153**	**0.4153**		**0.3830**	**0.3830**	**0.0000**	**1,296.8664**	**1,296.8664**	**0.4111**		**1,307.1442**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0480	0.0329	0.3317	8.8000e-004	0.0946	6.7000e-004	0.0953	0.0252	6.2000e-004	0.0258		87.5114	87.5114	2.3300e-003		87.5697
Total	**0.0480**	**0.0329**	**0.3317**	**8.8000e-004**	**0.0946**	**6.7000e-004**	**0.0953**	**0.0252**	**6.2000e-004**	**0.0258**		**87.5114**	**87.5114**	**2.3300e-003**		**87.5697**

4.0 Operational Detail - Mobile

APPENDIX C: BIOLOGICAL RESOURCES ASSESSMENT

BIOLOGICAL RESOURCES TECHNICAL REPORT

CITY OF SACRAMENTO GROUNDWATER MASTER PLAN

SACRAMENTO, SACRAMENTO COUNTY, CALIFORNIA

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WRA #30359
JULY 2020

wra
ENVIRONMENTAL CONSULTANTS

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DEFINITIONS

Study Area: The area throughout which the assessment was performed, inclusive of 38 discrete Well Sites in the City of Sacramento.
Well Site: The area evaluated for potential direct impacts to sensitive biological resources, inclusive of a proposed project footprint and surrounding 100-foot buffer.

LIST OF ACRONYMS

BGEPA	Bald and Golden Eagle Protection Act
BIOS	Biogeographic Information and Observation System
BRTR	Biological Resources Technical Report
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFP	California Fully Protected Species
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
County	County of Sacramento
Corps	U.S. Army Corps of Engineers
CSRL	California Soils Resources Lab
CWA	Clean Water Act
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
GGS	Giant Garter Snake
ITP	Incidental Take Permit
LSAA	Lake or Streambed Alteration Agreement
Magnusen-Stevens Act	Magnuson-Stevens Fishery Conservation & Management
MBTA	Migratory Bird Treaty Act
NBHCP	Natomas Basin Habitat Conservation Plan
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OHWM	Ordinary High Water Mark
Rank	California Rare Plant Ranks
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
SWHA	Swainson's Hawk
SWRCB	State Water Resource Control Board
TOB	Top of Bank

USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle
VPFS	Vernal Pool Fairy Shrimp
VPTS	Vernal Pool Tadpole Shrimp
WBWG	Western Bat Working Group
WRA	WRA, Inc.

1.0 INTRODUCTION

This Biological Resources Technical Report evaluates existing biological resources, potential impacts, and mitigation measures (if required) for the City of Sacramento Groundwater Master Plan Project (Project). WRA, Inc. (WRA) performed a constraints assessment of biological resources on 38 discrete Well Sites located within the City of Sacramento, Sacramento County, California. Well Sites and a surrounding 100-foot buffer, collectively referred to as the Study Area, are all located in Sacramento County, California (Figure 1). The Study Area is a mix of undeveloped vacant land, parks, schools, median strips and industrial areas. Some of the individual Well Sites have some degree of infrastructure development, though most do not. The majority of the Well Sites are within or adjacent to areas of existing commercial and/or residential development. Site assessments were conducted between June 22 and June 26, 2020, to determine site conditions and identify potential constraints to future project activities at the Well Sites with respect to local regulations and ordinances and to identify any potential biological constraints pursuant to the California Environmental Quality Act (CEQA).

This report describes the results of the site visits, which assessed the Study Area for the (1) potential to support special-status species; and (2) presence of other sensitive biological resources protected by local, state, and federal laws and regulations.

1.1 Overview and Purpose

This report provides an assessment of biological resources within the Study Area and immediate vicinity. The assessment did not include a full protocol-level surveys for special-status species, though they were searched for if identifiable. The purpose of the assessment was to develop and gather information on sensitive biological communities and special-status plant and wildlife species to support an evaluation of the Project under CEQA. This report describes the results of the site visit, which assessed the Study Area for (1) the presence of sensitive biological communities, special-status plant species, and special-status wildlife species, (2) the potential for the site to support special-status plant and wildlife species. Based on the results of the site assessment, potential impacts to sensitive biological communities and special-status species resulting from the proposed project were evaluated. If the project has the potential to result in significant impacts to these biological resources, measures to avoid, minimize, or mitigate for those significant impacts are described.

A biological resources technical report provides general information on the presence, or potential presence, of sensitive species and habitats. Additional focused studies (such as protocol-level species surveys or wetland delineation) may be required to support regulatory permit applications or to implement mitigation measures included in this report. This assessment is based on information available at the time of the study and on site conditions that were observed on the dates the Well Sites were visited. Conclusions are based on currently available information used in combination with the professional judgement of the biologists completing this study.

1.2 Project Description

The City of Sacramento Well Replacement Program involves the construction and operation of up to 38 groundwater extraction wells within the City's water service area, which overlies the North American and

South American Subbasins of the Sacramento Valley Groundwater Basin, as well as distribution system improvements and the decommissioning of 38 existing active and inactive municipal wells that are at or near the end of their useful life.

The Well Sites are generally in an urban setting. Surrounding land uses for existing and proposed replacement wells include single-family residential, multi-family residential, schools, commercial, office, public facilities (such as existing well sites, water storage facilities, and water treatment facilities), and open space/park.

1.2.1 Construction Activities

Construction of wells under the Project would take place in four stages:

- Exploratory drilling would involve construction of test holes or monitoring wells to characterize the groundwater conditions at the site.
- Well drilling and construction would involve clearing of a pad for a drill rig followed by drilling operations, which would require drilling 24 hours per day for at least two weeks. Drilling may take longer for deeper wells. Wells would range in depth from about 250 feet to 1,200 feet.
- Well equipping includes the construction of all above-grade facilities as well below grade pipelines to connect the replacement well to the potable water distribution system. The remainder of the site would be cleared and the well and control building would be constructed. The site would be paved, landscaped and fenced. Pipelines to connect to the potable water distribution system would be constructed and each well would be connected to the sewer system for disposal of backwash water. Each well site would be about one acre in size (200 feet by 200 feet).
- Well destruction would entail removal of existing wells. If replacement wells are sited at an existing well facility the existing well would be destroyed in accordance with California Well Standards. If a replacement well is not located at the site of an existing well, well destruction would include removal of all above-ground facilities at the well site, with the exception of fencing, and underground piping would be abandoned in place.

During well drilling and equipping, the contractor would employ a staging area adjacent to the well site to store drilling equipment and materials. Staging areas would typically be in parking lots, lawn areas, or vacant land.

1.3 Summary of Results

In summary, no special-status species of plants or wildlife were observed during the site visits. However, based on a review of available information and an assessment of site conditions, WRA concludes that there is potential for special-status plants and wildlife, regulated habitats (e.g. wetlands and streams) and trees subject to local ordinances to occur within the Study Area, though this potential is restricted to a limited number of the discrete Well Sites. These constraints are described in greater detail in the following sections and are described in the context of the individual Well Sites that may support them. In addition, five of the Well Sites are within the Natomas Basin Habitat Conservation Plan (NBHCP).

Table 1. Summary of Biological Resources Evaluation

CEQA Assessment Category[1] IV. -Biological Resources	Biological Resources Considered	Relevant Laws and Regulations	Responsible Regulatory Agency	Summary of Findings & Report Section[2]
Question A. Special-status species	Special-status Plants Special-status Wildlife Designated Critical Habitat	Federal Endangered Species Act (ESA), California Endangered Species Act (CESA), California Native Plant Protection Act (CNPPA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA)	U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. See Section 7.1 for more information
Question B. Sensitive natural communities & Riparian habitat	Sensitive Natural Communities Streams, Lakes, & Riparian Habitat	California Fish and Game Code (CFGC), Oak Woodland Conservation Act, Porter-Cologne Water Quality Control Act, Clean Water Act (CWA)	California Department of Fish and Wildlife (CDFW), U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. **See Section 7.2 for more information**
Question C. State and federally protected wetlands	Wetlands Unvegetated surface waters	Clean Water Act (CWA) Sections 404/401, Rivers and Harbors Act Section 10, Porter-Cologne Water Quality Control Act	U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. **See Section 7.3 for more information**

[1] *CEQA Questions have been summarized here; see Section 6.2 for details.*
[2] *As given in this report; see Section 5.0 subheadings*

CEQA Assessment Category1IV. -Biological Resources	Biological Resources Considered	Relevant Laws and Regulations	Responsible Regulatory Agency	Summary of Findings & Report Section2
Question D. Fish & wildlife corridors	Essential Fish Habitat, Wildlife Corridors	California Fish and Game Code (CFGC), Magnusen-Stevens Fishery Conservation & Management Act	California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS)	Potentially significant impacts were not identified during this assessment. **See Section 7.4 for more information**
Question E. Local policies	Protected Trees Other biological protections	Local Tree Ordinance, General Plan (e.g., Stream & Wetland Setbacks), Local ordinances	Local and regional agencies	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less than significant. **See Section 7.5 for more information**
Question F. Local, state, federal conservation plans	Habitat Conservation Plans, Natural Community Conservation Plans	Federal Endangered Species Act (ESA), Natural Community Conservation Planning Act (NCCPA)	U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW)	Potentially significant impacts were not identified. **See Section 7.6 for more information**

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2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological resources technical report, including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts. Table 1 shows the correlation between these regulations and each Biological Resources question in the Environmental Checklist Form (Appendix G) of the CEQA guidelines.

2.1 Federal and State Regulatory Setting

2.1.1 Vegetation and Aquatic Communities

CEQA provides protections for particular vegetation types defined as sensitive by the CDFW, and aquatic communities protected by laws and regulations administered by the EPA, Corps, SWRCB, and RWQCB. The laws and regulations that provide protection for these resources are summarized below.

Sensitive Natural Communities: Sensitive natural communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" (CDFG 2010, CDFW 2018a) and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2020a). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2020) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). In addition, this general class includes oak woodlands that are protected by local ordinances under the Oak Woodlands Protection Act.

Waters of the United States, Including Wetlands: The Corps regulates “Waters of the United States” under Section 404 of the CWA. Waters of the United States are defined in the Code of Federal Regulations (CFR) as including the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, such as tributaries, lakes and ponds, impoundments of waters of the U.S., and wetlands (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Unvegetated waters including lakes, rivers, and streams may also be subject to Section 404 jurisdiction and are characterized by an ordinary high water mark (OHWM) identified based on field indicators such as the lack of vegetation, sorting of sediments, and other indicators of flowing or standing water. The placement of fill material into Waters of the United States generally requires a permit from the Corps under Section 404 of the CWA.

The Corps also regulates construction in navigable waterways of the U.S. through Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403). Section 10 of the RHA requires Corps approval and a permit for excavation or fill, or alteration or modification of the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor or refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States. Section 10 requirements apply only to navigable waters themselves, and are not applicable to tributaries, adjacent wetlands, and similar aquatic features not capable of supporting interstate commerce.

Waters of the State, Including Wetlands: The term "Waters of the State" is defined by the Porter-Cologne Water Quality Control Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWRCB and nine RWQCB districts protect waters within this broad regulatory scope through many different regulatory programs. Waters of the State in the context of a CEQA Biological Resources evaluation include wetlands and other surface waters protected by the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. The SWRCB and RWQCB issue permits for the discharge of fill material into surface waters through the State Water Quality Certification Program, which fulfills requirements of Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a CWA permit are also required to obtain a Water Quality Certification. If a project does not require a federal permit, but does involve discharge of dredge or fill material into surface waters of the State, the SWRCB and RWQCB may issue a permit in the form of Waste Discharge Requirements.

Sections 1600-1616 of California Fish and Game Code: Streams and lakes, as habitat for fish and wildlife species, are regulated by CDFW under Sections 1600-1616 of CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake or Streambed Alteration Agreement (LSAA). The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). The term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). Riparian vegetation has been defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 LSAA from CDFW.

2.1.2 Special-status Species

Endangered and Threatened Plants, Fish and Wildlife. Specific plant and wildlife species may be designated as threatened or endangered by the ESA, or CESA. Specific protections and permitting mechanisms for these species differ under each of these acts, and a species' designation under one law does not automatically provide protection under the other.

The ESA (16 USC 1531 et seq.) is implemented by the USFWS and the NMFS. The USFWS and NMFS maintain lists of "endangered" and "threatened" plant and wildlife species (referred to as "listed species"). "Proposed" or "candidate" species are those that are being considered for listing, and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. Take under the ESA is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in "take" of an ESA-listed species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federal-listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features "essential to the conservation of the species". Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

The CESA (CFGC 2050 et seq.) prohibits a "take" of any plant and animal species that the California Fish and Game Commission determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to "candidate species" which are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit (ITP) under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

Fully Protected Species and Designated Rare Plant Species. This category includes specific plant and wildlife species that are designated in CFGC as protected even if not listed under CESA or the ESA. Fully Protected Species include specific lists of birds, mammals, reptiles, amphibians, and fish designated in CFGC. Fully protected species may not be taken or possessed at any time and, therefore, no licenses or permits may be issued for take of fully protected species, except for necessary scientific research and conservation purposes. The definition of "take" is the same under the California Fish and Game Code and the CESA. By law, CDFW may not issue an Incidental Take Permit (ITP) for Fully Protected Species. Under the California Native Plant Protection Act (NPPA), CDFW has listed 64 "rare" or "endangered" plant species, and prevents "take", with few exceptions, of these species. CDFW may authorize take of species protected by the NPPA through the ITP process, or under a NCCP.

Special Protections for Nesting Birds and Bats. The federal Bald and Golden Eagle Protection Act (BGEPA) provides relatively broad protections to both of North America's eagle species (bald eagle [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*]) that in some regards are similar to those provided by the ESA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act (MBTA) of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) provides for conservation and management of fishery resources in the U.S., administered by NMFS. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g. eelgrass (*Zostera* spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

Species of Special Concern, Movement Corridors, and Other Special Status Species under CEQA. To address additional species protections afforded under CEQA, CDFW has developed a list of special species as "a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status." This list includes species lists developed by other organizations, including for example, the Audubon Watch List Species, the Bureau of Land Management Sensitive Species, and USFWS Birds of Special Concern. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1, 2, and 3 are also considered special-status plant species and must be considered under CEQA. Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. Additionally, any species listed as sensitive within the NBHCP, or other local plans, policies and ordinances are likewise considered sensitive in the HCP area. Movement and migratory corridors for native wildlife (including aquatic corridors) as well as wildlife nursery sites are given special consideration under CEQA.

2.2 Local Regulatory Setting

City of Sacramento 2035 General Plan

The City of Sacramento's 2035 General Plan (General Plan; City of Sacramento 2015a) was written to serve as a guide for future development and growth in the City of Sacramento. Included in the General Plan is guidance pertaining to environmental resources, including "riparian habitat," "annual grasslands," and "wetland protection." Relevant General Plan language is as follows:

ER 2.1.6 Wetland Protection. The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands, to the extent feasible. If not feasible, the mitigation of all adverse impacts on wetland resources shall be required in compliance with State and Federal regulations protecting wetland resources, and if applicable, threatened or endangered species. Additionally, the City shall require either on- or off-site permanent preservation of an equivalent amount of wetland habitat to ensure no net-loss of value and/or function.

Applicable Habitat Conservation Plans (HCPs)

Natomas Basin Habitat Conservation Plan

The NBHCP (City of Sacramento et al. 2003) was developed to promote biological conservation together with in conjunction with economic and urban development within the Natomas Basin, which is located in northern Sacramento County and southern Sutter County. The NBHCP establishes a multi-species conservation program designed to allow for continued development within the Natomas Basin while mitigating the anticipated impacts to habitats and the incidental take of protected species resulting from development. Projects located within the NBHCP Area may obtain permits and mitigation coverage through payment of in-lieu fees to the NBHCP. Projects receiving permits through the NBHCP must also implement avoidance and minimization measures included in the NBHCP to reduce the potential for take of covered species. These measures are outlined in Chapter 5 of the NBHCP. Measures include a pre-construction survey between 30 days and 6 months (or prior year for species with seasonal survey windows) prior to initiation of construction activities and additional species-specific conservation measures.

The Study Area is partially located within the NBHCP Area. The five Well Sites that are located within the NBHCP area are: Well 15, Well 19, Well 20, Well 23, and Well 39.

City of Sacramento Tree Ordinance. The City of Sacramento Tree Ordinance requires approval for the regulated work to City Trees for public projects (Section 12.56.040). Regulated work includes planting, removal, or work which may adversely impact the health of trees on City property. The Ordinance defines a "City Tree" as:

> Any tree the trunk of which, when measured at 4.5 feet above ground is partially or completely located in a city park, or on real property the city owns…"

If a public project may potentially remove City Trees, and avoidance is not feasible, the city project manager shall provide written justification to the director of the need to remove City Trees for the public project. City Trees that have a diameter at standard height (DSH) of 4 inches or more require approval of the director. If the DSH is less than 4 inches, the tree shall be removed as provided in Section 12.56.030. C.

3.0 ASSESSMENT METHODOLOGY

On June 22 through June 24, 2020, WRA biologists visited the Study Area to map vegetation, aquatic communities, unvegetated land cover types, document plant and wildlife species present, and evaluate habitat on site for the potential to support special status species as defined by the CEQA. Prior to the site visit, WRA biologists reviewed literature resources and performed database searches to assess the potential for sensitive biological communities (e.g., wetlands) and special-status species (e.g., endangered plants), including:

- Soil Survey of Sacramento County, California (USDA 1993)
- Sacramento East and Rio Linda 7.5-minute quadrangle (USGS 2018)
- Contemporary aerial photographs (Google Earth 2020)
- Historical aerial photographs (Historical Aerials 2020)
- National Wetlands Inventory (USFWS 2020a)
- California Aquatic Resources Inventory (SFEI 2020)
- California Natural Diversity Database (CNDDB, CDFW 2020a)
- California Native Plant Society Electronic Inventory (CNPS 2020a)
- Consortium of California Herbaria (CCH 2020)
- USFWS List of Federal Endangered and Threatened Species (USFWS 2020b)
- eBird Online Database (eBird 2020)
- CDFW Publication, California Bird Species of Special Concern in California (Shuford and Gardali 2008)
- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009)
- A Manual of California Vegetation Online (CNPS 2020b)
- Preliminary Descriptions of the Terrestrial Natural Communities (Holland 1986)
- California Natural Community List (CDFW 2018a)

- Natomas Basin Habitat Conservation Plan (City of Sacramento 2003)

Database searches (i.e., CNDDB, CNPS) focused on the geographic extent of the Study Area and the surrounding five miles for special-status plants and wildlife. Figures 2 and 3 in Appendix A contains occurrences of special-status species documented within a five-mile radius of the Study Area.

Following the remote assessment, WRA biologists completed a field review over the course of three days to document: (1) land cover types (e.g., vegetation communities, aquatic resources), (2) potential for the Study Area to provide suitable habitat for any special-status plant or wildlife species, (3) potential for the Study Area to support wetlands, and other potential constraints such as trees subject to local ordinances and (4) to document special-status species if detectable and present[3].

3.1 Vegetation Communities and Other Land Cover Types

During the site visit, WRA evaluated the species composition and area occupied by distinct vegetation communities, aquatic communities, and other land cover types. Sensitive land cover types were mapped at a coarse level. Mapping of these classifications utilized a combination of aerial imagery and field surveys. In most instances, communities are characterized based on distinct shifts in plant assemblage (vegetation), and follow the California Natural Community List (CDFW 2018b), *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and *A Manual of California Vegetation, Online Edition* (CNPS 2020b). These vegetation manuals do not describe every potential vegetation assemblage in California, and so in some cases, it is necessary to identify other appropriate vegetative classifications based on best professional judgment of WRA biologists. When undescribed variants are used, it is noted in the description. Vegetation alliances (natural communities) with a CDFW Rank of 1 through 3 ((globally critically imperiled (S1/G1), imperiled (S2/G2), or vulnerable (S3/G3)), were evaluated as sensitive as part of this evaluation.

The Study Area was assessed for the potential presence of wetlands and other aquatic resources based on the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Areas meeting these indicators were mapped at an assessment level as aquatic resources and categorized using the vegetation community classification methods described above where possible. Aquatic communities which are mapped in the NMFS Essential Fish Habitat Mapper (NMFS 2020), or otherwise meet criteria for designation as Essential Fish Habitat are indicated as such in the community description below in Section 5.1. The presence of riparian habitat was evaluated based on woody plant species meeting the definition of riparian provided in *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607, California Fish and Game Code* (CDFG 1994) and based on best professional judgement of biologists completing the field surveys.

[3] Due to the timing of the assessment, it may or may not constitute protocol-level species surveys; see Section 4.2 if the site assessment would constitute a formal or protocol-level species survey.

3.2 Special-status Species

3.2.1 General Assessment

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database review as described above. Presence of suitable habitat for special-status species was evaluated during the site visit(s) based on physical and biological conditions of the site, as well as the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then determined according to the following criteria:

- No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

- Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

- Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

- High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

- Present. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site in the recent past.

If a more thorough assessment was deemed necessary, a targeted or protocol-level assessment may be recommended as a future study. If a special-status species was observed during the site visit, its presence was recorded and discussed below in Section 5.2. If designated critical habitat is present for a species, the extent of critical habitat present and an evaluation of critical habitat elements is provided as part of the species discussions below.

3.2.2 Special-status Plants

A general assessment for special-status plants was conducted within the Study Area June 22 through 24, 2020. The survey assessed the habitat within the Study Area to determine if any special-status plants have the potential to occur.

To determine the presence or absence of special-status plant species determined to have potential and that were identifiable in the month of June, those species were searched for during the assessment site visits June 22 through June 24, 2020. The field surveys were conducted by botanists familiar with the flora of Sacramento and surrounding counties.

3.2.3 Special-status Wildlife

The study evaluated the likelihood for each special-status species wildlife species to be present in Study Area based on the suitability of habitat observed (Appendix C). No special field studies (e.g. protocol level) were conducted as part of this study. As such, any conclusions reached as to presence and absence of a special status species may be subject to modification should new information become available.

To the extent possible, the study also evaluated an approximately 200-foot to 0.5-mile area surrounding the Study Area, depending on the species, in order to comply with applicable NBHCP requirements. Where NBHCP requirements are not applicable, evaluations were limited to the Study Area, as previously described.

3.3 Wildlife Corridors and Native Wildlife Nursery Sites

To account for potential impacts to wildlife movement/migratory corridors, biologists reviewed maps from the California Essential Connectivity Project (CalTrans 2010), and habitat connectivity data available through the CDFW Biogeographic Information and Observation System (BIOS). Additionally, aerial imagery (Google 2018) for the local area was referenced to assess if local core habitat areas were present within, or connected to the Study Area. This assessment was refined based on observations of on-site physical and/or biological conditions, including topographic and vegetative factors that can facilitate wildlife movement, as well as on-site and off-site barriers to connectivity.

The potential presence of native wildlife nursery sites is evaluated as part of the site visit and discussion of individual wildlife species below. Examples of native wildlife nursery sites include nesting sites for native bird species (particularly colonial nesting sites), marine mammal pupping sites, and colonial roosting sites for other species (such as for monarch butterfly).

4.0 ECOLOGICAL SETTING

The Study Area includes 38 discrete areas located throughout the City of Sacramento. These areas are generally located east of Interstate 5/Highway 70, west of Watt Avenue, south of West Elkhorn Boulevard, and north of Cosumnes River Boulevard. The Study Area includes all areas affected by the Project, as well as a 100-foot buffer, excluding some lateral subsurface pipes. Additional details of the local setting are below.

4.1 Soils and Topography

The overall topography of the Study Area is flat with elevations ranging from approximately 30 to 60 feet above sea level. According to the *Soil Survey of Sacramento County* (USDA 1993; CSRL 2020), the Study Area is underlain by 26 soil mapping units; Table 2 below lists each soil mapping unit and indicates the Study Area which contains that soil unit. The parent soil series of all the Study Area's mapping units are summarized below.

Table 2. Soil Mapping Units within the Study Area

Soil Mapping Unit	Well Site
Bruella sandy loam, 0 to 2 percent slopes	22, 32
Clear Lake clay, hardpan substratum, drained, 0 to 1 percent slopes	19, 20
Columbia sandy loam, drained, 0 to 2 percent slopes	24
Cosumnes silt loam, drained, 0 to 2 percent slopes	23
Cosumnes silt loam, partially drained, 0 to 2 percent slopes	15, 39
Cosumnes-Urban land complex, partially drained, 0 to 2 percent slopes	15
Durixeralfs, 0 to 1 percent slopes	13
Egbert clay, partially drained, 0 to 2 percent slopes	2
Galt clay, 0 to 2 percent slopes	14
Galt-Urban land complex, 0 to 2 percent slopes	1
Madera loam, 0 to 2 percent slopes	12, 37
Madera-Galt complex, 0 to 2 percent slopes	11
Pits	7, 35
Riverwash	5
Rossmoor-Urban land complex, 0 to 2 percent slopes	5, 6, 38
San Joaquin fine sandy loam, 0 to 3 percent slopes	17, 22, 26, 28
San Joaquin silt loam, 0 to 3 percent slopes	3, 37
San Joaquin silt loam, leveled, 0 to 1 percent slope	37
San Joaquin-Durixeralfs complex, 0 to 1 percent slopes	9
San Joaquin-Galt complex, leveled, 0 to 1 percent slopes	14
San Joaquin-Urban land complex, 0 to 2 percent slope	1, 2, 3, 4, 8, 16, 33, 35
San Joaquin-Urban land complex, 0 to 3 percent slopes	10, 21, 26, 27, 29, 30, 31
Urban land	24, 25, 31, 34
Water	39
Xerarents-San Joaquin complex, 0 to 1 percent slopes	9, 17, 36
Xerarents-Urban land-San Joaquin complex, 0 to 5 percent slopes	8

4.2 Climate and Hydrology

The Study Area is located in the southern portion of the Sacramento Valley. The average monthly maximum temperature in the area is 73 degrees Fahrenheit, while the average monthly minimum temperature is 49 degrees Fahrenheit. Predominantly, precipitation falls as rainfall between November and March with an annual average precipitation of 18 inches (WRCC 2020).

Regional watersheds within the Study Area include Cache Slough-Sacramento River (HUC 8: 180-20-163), Lower American River (HUC 8: 180-20-111), and Auburn Ravine-Coon Creek (HUC 8: 180-20-161). Several blue-line streams are present within or immediately adjacent to the Study Area (USGS 2018). Several mapped resources in the National Wetlands Inventory (NWI; USFWS 2020a), and California Aquatic Resources Inventory (CARI; SFEI 2020) are situated in the Study Area. Detailed descriptions of aquatic resources are provided in Section 5.1 below.

4.3 Land-use

The majority of the Study Area is landscaped or maintained vegetation of City parks or schools and/or developed with City infrastructure. Undeveloped areas consist of ruderal vegetation or non-native grassland in un-developed City lots. Detailed plant community descriptions are included in Section 5.1 below, and all observed plants are included in Appendix B. Surrounding land uses include residential and industrial (Google Earth 2020). Historically, the Study Area was developed for agriculture (Historic Aerials 2020).

5.0 ASSESSMENT RESULTS

5.1 Vegetation Communities and Other Land Cover

WRA observed seven land cover types within the Study Area: developed, landscaped, non-native grassland, seasonal wetlands, drainage canals, ditch, and artificial pond. Sensitive land cover types within the Study Area are illustrated in Figure 4 (Appendix A). The non-sensitive land cover types in the Study Area include non-native grasslands, landscaped and developed areas, and artificial pond, while the sensitive communities include the streams (drainage canals and ditches) and seasonal wetlands.

Table 3. Sensitive Land Cover Types

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING	WELL SITES WITH SENSITIVE LAND COVER TYPES
Aquatic Resources			
Seasonal wetland	Sensitive	N/A	2, 13, 12, 28, 29, 30, 37
Drainage Canal	Sensitive	N/A	24, 30, 39
Ditch	Sensitive	N/A	2, 28

5.1.1 Terrestrial Land Cover

Developed Area (no vegetation alliance). CDFW Rank: None. Developed areas include areas which are paved or have structures. If planted trees are immediately adjacent to the paved areas, these are included within developed areas. Developed areas include parking lots, access roads and structures within the Study Area. Vegetation in developed areas includes planted native and non-native trees. Generally the trees are young and small with little to somewhat developed canopy.

Landscaped Area (no vegetation alliance). CDFW Rank: None. Landscape areas include areas which are dominated by vegetation which is regularly maintained. Landscaped areas include City parks, fields at City schools, and vegetated median strips within City roads. Vegetation within the landscaped areas include mowed fields of turf grasses dominated by Bermuda grass (*Cynodon dactylon*), dallis grass (*Paspalum dilatatum*), and bluegrass (*Poa* spp.). Associated species include white clover (*Trifolium repens*), ribwort (*Plantago lanceolata*), common plantain (*Plantago major*), and common purslane (*Portulaca oleracea*). Landscaped areas also include planted and/or natural stands of native and non-native trees. Native trees observed included valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), California sycamore (*Platanus racemosa*), and interior live oak (*Quercus wislizenii*). The trees ranged from saplings to mature. Non-native trees observed in landscaped areas included but are not limited to black locust (*Robinia pseudoacacia*), crape myrtle (*Lagerstroemia indica*), Chinese pistache (*Pistacia chinensis*), and London plane (*Platanus* x *racemosa*).

Non-native grassland (Wild Oats Grassland-*Avena* spp. Herbaceous Semi-Natural Alliance). CDFW Rank: None. Non-native grasslands are present within many of the Well Sites, occurring in undeveloped and unmaintained locations. These non-native grasslands vary in species composition, but are commonly dominated by slim oat (*Avena barbata*) and generally best fit the Wild Oats Grassland Alliance (CNPS 2020b). The vegetation is dominated by slim oat and other non-native grasses, including Bermuda grass, ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), and downy chess (*Bromus tectorum*). Associated species include wild lettuce (*Lactuca saligna*), filaree (*Erodium* spp.), field bindweed (*Convolvulus arvensis*), short-podded mustard (*Hirschfeldia incana*), cheese weed (*Malva parviflora*), and

willow herb (*Epilobium brachycarpum*). Many of these areas were mowed or disked prior to the field work, which is likely an annual or biannual occurrence.

5.1.2 Aquatic Resources

Seasonal Wetland (Perennial ryegrass fields-*Festuca perennis* Herbaceous Semi-Natural Alliance; Creeping ryegrass turf-*Elymus triticoides* Herbaceous Alliance). CDFW Rank: Italian ryegrass fields: No Rank; Creeping ryegrass turf: G3 S3. Seasonal wetlands occur in areas where the soil is saturated for a duration sufficient to support hydrophytic vegetation; saturated conditions are generally absent during the dry season. Several potential seasonal wetlands are present within the Study Area; most seasonal wetlands within the Study Area best fit the Perennial Ryegrass Field alliance. One location (Well 28) also contains a seasonal wetland which best fits the Creeping Ryegrass Turf alliance. Within the Study Area, seasonal wetlands occur in depressions on areas of compacted soil or in ditches which show no indications of flow. Typical vegetation within the perennial ryegrass wetlands includes Italian ryegrass, barley (*Hordeum marinum*), hood canary grass (*Phalaris paradoxa*), smartweed (*Persicaria* sp.), tall cyperus (*Cyperus eragrostis*), hyssop loosetrife (*Lythrum hyssopifolia*), toad rush (*Juncus bufonius*), curly dock (*Rumex crispus*), and bristly ox-tongue (*Helminthotheca echioides*). The creeping ryegrass wetland is dominated by creeping ryegrass. Indicators of hydric soils and wetland hydrology were observed in areas mapped as seasonal wetland. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Drainage canal (no vegetation alliance). CDFW Rank: None. Several sites (24, 30, and 39) are located within 100-feet of drainage canal. Drainage canals within the Study Area are man-made channels with earthen or concrete bottoms which appear to be re-routed channels. These features contain an obvious bed and bank and contain indicators of OHWM. Drainage canals observed in the Study Area ranged between 10 and 30-feet wide between top-of-bank (TOB), and the beds ranged between 4 and 10 feet wide between OHWMs. No or very little herbaceous vegetation is present within the TOB of the concrete-lined canals. Vegetation within the TOB of drainage canals with earthen bottoms was generally herbaceous and occasionally mowed. Generally, a narrow band of stream-fringe vegetation is present along the OHWM within the TOB, dominated by hydrophytic species such as tall nutsedge, western goldenrod (*Euthamia occidentalis*), and Italian ryegrass; above the OHWM, vegetation is dominated by ruderal species, including milk thistle (*Silybum marinum*), ripgut brome, yellow star thistle (*Centaurea solstitialis*), and filaree. Patches of water primrose (*Ludwigia* sp.) and mosquito fern (*Azolla* sp.) occur as floating vegetation in some of the features. Woody shrubs and trees if present, appeared to be planted ornamental or native trees. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Ditch (no vegetation alliance). CDFW Rank: None. Ephemeral ditches are located in the Study Area at Well Sites 2 and 28. These features capture surface flow and convey the water to a larger nearby conveyance. The ditch is vegetated and no indication of flow was observed. The TOB of the features was approximately 5-6 feet wide while the OHWM is approximately 2-3 feet wide. Hydrophytic vegetation, dominated by Italian ryegrass is present within the OHWM. Weedy upland species are present above the OHW line to the TOB. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Pond (no vegetation alliance). CDFW Rank: None. An artificially created ornamental pond is present at one site (Well 35). The TOB of the pond is dominated by non-native grassland and planted trees, which are maintained. A small patch of cattail (*Typha* sp.) is present within the pond in the Study Area. This

feature was absent in 1966 aerial imagery (Historic Aerials 2020) and is not currently mapped by USFWS nor CARI (NWI 2020; SFEI 2020) and is not considered a sensitive resource.

5.2 Special-status Species

5.2.1 Special-status Plants

Based upon a review of the resource databases listed in Section 4.0, including the NBHCP, 23 special-status plant species have been documented in the vicinity of the Study Area. Seven of these plants have the potential to occur in the Study Area. The remaining species documented from the greater vicinity are unlikely or have no potential to occur for one or more of the following:

- Hydrologic conditions (e.g., perennial wetlands, vernal pools) necessary to support the special-status plant species are not present in the Study Area;
- Edaphic (soil) conditions (e.g., alkaline soils) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., perennial marsh, vernal pool) necessary to support the special-status plant species are not present in the Study Area;
- The Study Area is geographically isolated by surrounding development from the documented range of the special-status plant species;
- The historical landscape and/or habitat(s) of the Study Area were not suitable habitat prior to land/type conversion to support the special-status plant species;
- Land use history and contemporary management (e.g., grading, mowing, pesticide use) has degraded the localized habitat necessary to support the special-status plant species.

WRA biologists conducted assessment level surveys during a period sufficient to identify two of the seven special-status plant species with the potential to occur: pappose tarplant (*Centromadia parryi* ssp. *parryi*) and Pary's rough tarplant (*Centromadia parryi* ssp. *rudis*). These two species have peak blooming periods within the month of June and would be identifiable if present. No special-status species were observed during the June site visit. The remaining species with potential habitat in the Study Area are summarized below.

Table 4. Potential Special-status Plants

Scientific Name	Common Name	Conservation Status	Well Sites with Habitat on or Nearby
Formally Listed Plants (FESA, CESA, CNPPA)			
No formally listed plants have the potential to occur			
Other Special-status Plants (CEQA, other)			
Brodiaea rosea ssp. *vallicola*	valley brodiaea	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Downingia pusilla	Dwarf downingia	Rank 2B	12, 37

Scientific Name	Common Name	Conservation Status	Well Sites with habitat on or nearby
Fritillaria agrestis	stinkbells	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Navarretia eriocephala	hoary navarretia	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Trifolium hydrophilum	saline clover	Rank 1B	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32

Valley brodiaea (*Brodiaea rosea* ssp. *vallicola*). Rank 4. Moderate Potential. Valley brodiaea is a bulbiferous perennial forb in the brodiaea family (Themidaceae) that blooms from April through May. It typically occurs in swales in valley and foothill grassland and vernal pools in the eastern portion of the Sacramento valley at elevations ranging from 5 to 245 feet (CNPS 2020a). Known associated species include medusa head (*Elymus caput-medusea*), soft chess (*Bromus hordeaceus*), rattail grass (*Festuca myuros*), hawkbit (*Leontodon saxatilis*), rose clover (*Trifolium hirtum*), big heron bill (*Erodium botrys*), Italian ryegrass (*Festuca perennis*), and tarplant (*Holocarpha virgata*) (CCH 2020). This species has the potential to occur in non-native grasslands present within the Study Area.

Dwarf downingia (*Downingia pusilla*), Rank 2B.2. Moderate Potential. Dwarf downingia is annual forb in the harebell family (Campanulaceae) that blooms from March to May. It typically occurs on slightly acidic clay to clay loam mesic areas on the edge of vernal pools and lakes in valley and foothill grassland at elevations ranging from 3 to 1450 feet (CNPS 2020a). This species is an obligate (OBL) wetland plant (Lichvar et al. 2016), and is regularly known from vernal pool habitat, but may occur in other wetland habitat types. Known associated species include maroon spot calico flower (*Downingia concolor*), California goldfields (*Lasthenia californica*), California oat grass (*Danthonia californica*), semaphore grass (*Pleuropogon californicus*), annual hairgrass (*Deschampsia danthonioides*), barleys (*Hordeum* spp.), Italian ryegrass, rattlesnake grasses and docks (*Rumex crispus, R. pulcher*) (CDFW 2020a). This species has a moderate potential to occur in depressional seasonal wetlands observed at Well Sites 12, and 37 due to the presence of associated species and enclosed depressional wetlands.

Stinkbells (*Fritillaria agrestis*). Rank 4. Moderate Potential. Stinkbell is a bulbiferous perennial forb in the lily family (Liliaceae) that blooms from March to June. It typically occurs on clay soils, sometimes derived from serpentine, in grassy areas, occasionally near vernal pools, within cismontane woodland, chaparral, pinyon and juniper woodland, and valley and foothill grassland habitat at elevations ranging from 30 to 5055 feet (CNPS 2020a). This species is a facultative (FAC) plant (Lichvar 2016), but has no vernal pool indicator status (Keeler-Wolf et al. 1998). Known associated species include ripgut brome, soft chess, Italian rye grass, and fillarees (CCH 2020). This species has the potential to occur in non-native grassland present within the Study Area.

Hoary navarretia (*Navarretia eriocephala*). Rank 4. Moderate Potential. Hoary navarretia is an annual herb in the phlox family (Polemoniaceae) that blooms from May to June. It typically occurs in vernally mesic cismontane woodland and valley and foothill grassland at elevations ranging from 340 to 1,310 feet (CNPS 2016a). This species is a facultative wetland plant (Lichvar et al. 2016) and is a vernal pool generalist (Keeler-Wolf et al. 1998). Known associated species include blue oak, manzanitas (*Arctostaphylos* spp.), oats (*Avena* spp.), Italian ryegrass, bromes (*Bromus* spp.), filarees, adobe navarretia (*Navarretia nigelliformis*), marigold navarretia (*N. tagetina*), June grass (*Koeleria macrantha*), and yellow starthistle (CCH 2020). This species has the potential to occur in non-native grassland present within the Study Area.

Saline clover (*Trifolium hydrophilum*). Rank 1B. Moderate Potential. Saline clover is an annual herb in the pea family (Fabaceae) that blooms from April to June. It typically occurs in mesic, alkali sites in marsh, swamp, valley and foothill grassland, and vernal pool habitat at elevations ranging from 0 to 980 feet (0 to 300 meters) (CDFW 2020a, CNPS 2020a). This species is a facultative plant (Lichvar et al. 2016). Known associated species include semaphore grass (*Pleuropogon californicus*), salt grass (*Distichlis spicata*), Italian rye grass, brass buttons (*Cotula coronopifolia*), calico flowers (*Downingia* spp.), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), hyssop loosestrife, toad rush, California oat grass (*Danthonia californica*), purslane speedwell (*Veronica peregrina* ssp. *xalapensis*), meadow barley (*Hordeum brachyantherum*), clovers (*Trifolium microdon*, *T. wormskioldii*, *T. fucatum*), and sand spurry (*Spergularia macrotheca*) (CDFW 2020a). This species has potential to occur in seasonal wetlands within the Study Area.

5.2.2 Special-status Wildlife

No Critical Habitat, EFH or Wildlife Corridors were identified as occurring in the Study Area during this assessment. Potentially suitable habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) exists on two Well Sites. Potential habitat for vernal pool fairy shrimp is present on Well Sites containing wetlands and ditches. All of the Well Sites have potential to support one or more species of nesting bird. Swainson's hawk has potential to nest in the Study Area and its vicinity, as do burrowing owls. Well Sites have potential to support day roosting bats where trees are present, however trees in the Well Sites are not large enough to support maternity roosts for bats. No buildings or trees that would support maternity roosts would be removed or demolished as part of the Project.

Of the special-status wildlife species documented in the vicinity of the Study Area, most are excluded from the majority of the Study Area based on a lack of habitat features and the position of the Study Area in an urban environment that precludes access to the majority of the individual Well Sites. Features not found within the Study Area that are required to support special-status wildlife species include:

- Suitable perennial aquatic habitat (e.g. streams, rivers or ponds) with suitable surrounding upland habitat (e.g. areas with animal burrows)
- Tidal Marsh areas
- Caves, mine shafts, or abandoned buildings
- Extensive grasslands
- Cut banks, riparian jungles, extensive emergent vegetation etc. to support nesting

The absence of such habitat features eliminates components critical to the survival or movement of most special-status species found in the vicinity. For instance, giant garter snake (*Thamnophis gigas*) is documented to historically occur in the vicinity of several parts of the Study Area. However, suitable aquatic habitat and movement corridors connecting the Study Area to source populations are absent, precluding this species from existing on the Study Area.

Six special-status species have potential to occur in the immediate vicinity of or in portions of the Study Area: Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), vernal pool fairy shrimp (VPFS; *Branchinecta lynchi*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus),* burrowing owl (*Athene cunicularia*), and Swainson's hawk (SWHA; *Buteo swainsonii*).

Native birds protected under the MBTA and CFGC may nest within the Study Area during nesting season (February 1 – August 31). Additionally, Swainson's hawk and burrowing owl are unlikely to nest within the majority of the Study Area, but may nest within 0.25 mile of the Study Area and a few sites may support nesting. Species not documented in the close vicinity of the Study Area and determined to be unlikely or have no potential to occur there are not discussed further, except as required by the NBHCP. Species and habitats evaluated in or immediately outside of the Study Area or species that have not been documented in the close vicinity of the Study Area but require discussion by the NBHCP are discussed below.

Table 5. Potential Special-status Wildlife

Scientific Name	Common Name	Conservation Status	Well Sites with Habitat on or Nearby
Formally Listed Wildlife (FESA, CESA)			
Branchinecta lynchi	vernal pool fairy shrimp	FT	Well Sites 2, 12, 13, 28, 29, 30, 37 have potential wetlands or other features onsite that may be suitable for VPFS.
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	FT	Well Sites 38 and 24 have *Sambucus*, the host plant for VELB.
Buteo swainsonii	Swainson's Hawk	ST	Suitable habitat is present within some sites and is located within 0.25 miles of all sites.
Other Special-status Wildlife (CEQA, other)			
Athene cunicularia	burrowing owl	SSC	This species has numerous documented occurrences in the vicinity of the Study Area and some sites contain burrows.
Lanius ludovicianus	loggerhead shrike	SSC	This species has been documented in the vicinity of the Study Area and may nest there.
Elanus leucurus	white-tailed kite	CFP	This species has been documented in the vicinity and may nest in trees and shrubs if they are available.

Vernal pool fairy shrimp (*Branchinecta lynchi*), Federal Threatened Species. No Potential/ Unlikely in Most Well Sites. Moderate Potential at Well Sites 2, 12, 13, 28, 29, 30 and 37. The vernal pool fairy shrimp is widespread but not abundant; populations are known from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County (additional disjunct populations exist at various locations throughout state). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear sandstone rock pools to large, turbid, alkaline, grassland valley floor pools.

Within the Study Area, Well Sites 2, 12, 13, 28, 29, 30, 37 have potential to support VPFS. While most of these sites do not have connectivity to documented occurrences of the species, their presence cannot be ruled out without additional study.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), Federal Threatened Species. Unlikely or No Potential at most Well Sites. Moderate Potential in Well Sites 38 and 24. This beetle is found throughout the Central Valley in elderberry (*Sambucus sp*.) shrubs, on which it is completely

dependent for larval development, and to a lesser degree, adult feeding. Typical habitat is characterized as large stands of mature elderberry shrubs in riparian or floodplain areas.

Within the Study Area, only two of the Well Sites, 24 and 38, were found to support *Sambucus*. Neither of these plants were found to contain evidence of VELB. However, at sites where *Sambucus* is present, VELB may be present.

Swainson's hawk (*Buteo swainsoni*). State Threatened. Moderate Potential. Swainson's hawk is a summer resident and migrant in California's Central Valley and scattered portions of the southern California interior. Areas typically used for nesting include the edges of narrow bands of riparian vegetation, isolated patches of oak woodland, lone trees, and also planted and natural trees associated with roads, farmyards, and sometimes adjacent residential areas. Foraging occurs in open habitats including grasslands, open woodlands, and agricultural areas. Swainson's hawk is not uncommon in the lower Sacramento Valley in locations where nest trees and foraging habitat are present.

There are trees within or adjacent to the Well Sites that could support nesting by Swainson's hawk and documented occurrences are present near several of the Well Sites and prevalent in the Sacramento area. All the Well Sites have potentially suitable nesting trees within 0.25 miles, though many of these have reduced potential to support the species due to their context in the urban setting and other factors. The entire Study Area is within foraging distance of suitable feeding areas. The foraging quality in most of the Study Area itself is diminished due to the majority of it being developed and managed, though a few of the Well Sites may occasionally be visited by foraging Swainson's hawk.

Burrowing owl (*Athene cunicularia*). CDFW Species of Special Concern. Unlikely at Most Well Sites, Moderate in the Vicinity. Burrowing owl occurs as a year-round resident and winter visitor in much of California's lowlands, inhabiting open areas with sparse or non-existent tree or shrub canopies. Typical habitat is annual or perennial grassland, although human-modified areas such as agricultural lands and airports are also used. This species is dependent on burrowing mammals to provide the burrows that are characteristically used for shelter and nesting, and in northern California, it is typically found in close association with California ground squirrels (*Otospermophilus beecheyi*). Manmade substrates such as pipes or debris piles may also be occupied in place of burrows.

No burrowing owls were observed within the Study Area. Burrows or burrow analogues were seen at Well Sites 7, 13, and 16. Wells 19, 20 and 28 have small culverts near the potential work areas that could be used by burrowing owls. Additional structures that may support burrowing owls are located outside the Study Area, but within its vicinity.

Loggerhead shrike (*Lanius ludovicianus*). CDFW Species of Special Concern. Unlikely or Moderate Potential in the Study Area. The loggerhead shrike is a year-round resident and winter visitor in lowlands and foothills throughout California. This species is associated with open country with short vegetation and scattered trees, shrubs, fences, utility lines and/or other perches. Although they are songbirds, shrikes are predatory and forage on a variety of invertebrates and small vertebrates. Captured prey items are often impaled for storage purposes on suitable substrates, including thorns or spikes on vegetation, and barbed wire fences. Loggerhead shrike nests in trees and large shrubs and nests are usually placed three to ten feet off the ground (Shuford and Gardali 2008).

The majority of the Study Area provides only marginal habitat for the species to nest and forage. Because potentially suitable habitat is present and the species has been documented in the region, the species has potential to occur and nest.

Giant garter snake (GGS; *Thamnophis gigas*). State Threatened, Federal Threatened, NBHCP species. Unlikely at Well Sites 19 and 39. No Potential at Remaining Well Sites. This endemic species of snake is found only in the Sacramento and San Joaquin Valleys. The giant garter snake prefers freshwater marshes and low gradient streams but has adapted to drainage channels and irrigation ditches. The giant garter snake inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley.

Though GGS is assessed as unlikely to occur, it is discussed further here because of its listed status and its inclusion in the NBHCP. Within the Study Area, there are no sites that have suitable habitat that have connectivity to populations that are presumed extant. Well Site 19 is located near an occurrence that is presumed to be extant but there is no suitable aquatic habitat onsite and the terrestrial areas lack refugia. Rip-rap and aquatic habitat adjacent to the site may potentially support GGS. This Well Site is within 200 feet of potentially occupied habitat and is within the NBHCP area.

Well Site 39 has an occurrence for GGS within it, but the area is developed, lacking suitable habitat, and the CNDDB description of the occurrence is "possibly extirpated", as are the majority of the occurrences in the Study Area's vicinity.

The remainder of the Study Area either does not contain suitable habitat to support this species and/or is separated from other suitable habitat by urban development, roadways, and disked fields. There is no suitable habitat for this species within 200 feet of the majority of the Study Area. Additionally, giant garter snake occurrences that are near Well Sites in the rest of the NBHCP are considered possibly extirpated, including the occurrences in closest proximity to the Study Area, (CDFW 2020). Land use changes in the vicinity have eliminated suitable habitat.

NBHCP Species Outside of the Study Area

The following buffers were evaluated for species covered under the NBHCP (Well Sites 15, 19, 20, 23, and 39) except when assessment would require entering properties where access was not granted:

- A 250-foot area surrounding the Study Areas within the NBHCP area was evaluated to determine whether any vernal pools, swales, or other seasonal wetlands capable of supporting vernal pool-associated species such as vernal pool fairy shrimp (*Branchinecta lynchi*), midvalley fairy shrimp (*B. mesovallensis*), vernal pool tadpole shrimp (*Lepidurus packardi*), western spadefoot toad (*Spea hammondii*), and California tiger salamander (*Ambystoma californiense*) were present. The 250-foot surrounding areas are either developed, have been disked or otherwise disturbed in such a way that no wetland features that would support vernal pool-associated species would be present.
- No Elderberry (*Sambucus* spp.) shrubs, the host plant for VELB, were observed at Well Sites subject to the NBHCP. However, Well Site 23 is within 1000 feet of riparian habitat that could support elderberry.
- No tricolor blackbird (*Agelaius tricolor*) nesting habitat was observed within 500 feet of the Study Area within the NBHCP area. .

- No Aleutian Canada geese (*Branta canadensis leucopareia*) were observed within the Study Area within the NBHCP area. .
- No white-faced ibis (*Plegadis chihi*) nesting habitat was observed within 0.25 mile of the Study Area within the NBHCP area.
- Loggerhead shrike (*Lanius ludovicianus*) nesting habitat was observed within 100 feet of the Study Area within the NBHCP area.
- No bank swallow (*Riparia riparia*) nesting habitat was observed within 250 feet of the Study Area within the NBHCP area.

5.3 Wildlife Corridors and Native Wildlife Nursery Sites

The Study Area is not within a designated wildlife corridor (CalTrans 2010). The site is located within a highly urbanized landscape. While common wildlife species presumably utilize the site to some degree for movement at a local scale, the Study Area itself does not provide corridor functions for most species and the limited scale of each Well Site further reduces the potential for these areas to play a significant role for wildlife transit. There is no Essential Fish Habitat or designated Critical Habitat within the Study Area. Well Site 39 has nearby nesting herons and egrets. Heron and egret nest sites are protected from disturbance that could result in nest failure or abandonment while active.

6.0 ANALYTICAL METHODOLOGY AND SIGNIFICANCE THRESHOLD CRITERIA

Pursuant to Appendix G, Section IV of the State CEQA Guidelines, a project would have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and/or,

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

These thresholds were utilized in completing the analysis of potential project impacts for CEQA purposes. For the purposes of this analysis, a "substantial adverse effect" is generally interpreted to mean that a potential impact could directly or indirectly affect the resiliency or presence of a local biological community or species population. Potential impacts to natural processes that support biological communities and special-status species populations that can produce similar effects are also considered potentially significant. Impacts to individuals of a species or small areas of existing biological communities may be considered less than significant if those impacts are speculative, beneficial, *de minimis*, and/or would not affect the resiliency of a local population.

7.0 IMPACTS AND MITIGATION EVALUATION

Using the CEQA analysis methodology outlined in Section 6.2 above, the following section describes potential significant impacts to sensitive resources within the Well Site as well as suggested mitigation measures which are expected to reduce impacts to less than significant. Table 6 indicates the potential constraints that may be present at each Well Site.

Table 6. Potential Sensitive Communities, City Trees and Special Status-species Constraints by Well Site

Well Site	Rare Plants	Wetlands	Ephemeral Ditches and/or Canals	Nesting and Special-status Birds	Giant Garter Snake	Vernal Pool Fairy Shrimp	Valley Elderberry Longhorn Beetle	Natomas Basin HCP	City Trees
2		YES	YES	YES		YES			YES
3				YES					YES
4				YES					YES
5				YES					YES
6				YES					
7	YES			YES					YES
8				YES					YES
9				YES					YES
10				YES					
11	YES			YES					
12	YES	YES		YES		YES			
13	YES	YES		YES		YES			
14				YES					
15	YES			YES				YES	
16				YES					YES
17				YES					
18				YES					
19				YES	YES*			YES	
20	YES			YES				YES	
21	YES			YES					YES
22				YES					
23				YES				YES	YES
24	YES		YES	YES			YES		
25				YES					
26				YES					YES
27				YES					YES
28	YES	YES		YES		YES			
29		YES		YES		YES			
30		YES	YES	YES		YES			YES
31	YES			YES					
32	YES			YES					YES
33				YES					
34				YES					
35				YES					YES
36				YES					YES
37	YES	YES		YES		YES			
38				YES			YES		

39			YES	YES	YES*			YES	
Section with discussion of mitigation		7.2, 7.3, 7.5	7.2, 7.3, 7.5	7.1	*Unlikely to occur but surveys required due to NBHCP (7.6)	7.1	7.1	7.6	7.5

7.1 Special-status Species and Nesting Birds

This section analyzes the Project's potential impacts and mitigation for special-status species in reference to the significance threshold outlined in CEQA Appendix G, Part IV (a):

> *Does the project have the potential to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Potential impacts and mitigation for potentially significant impacts are discussed below.

Special-Status Plant Species

Five special-status plant species have the potential to occur within non-native grassland habitat within the Study Area. As these species have peak blooming periods in April and May, presence or absence could not be determined during the June site visit and therefore the plants may potentially be present. As these species are considered special-status due to limited distribution within California and/or elsewhere, impacts to populations are considered a **potentially significant impact** under CEQA. None of the four species is "covered" under the Natomas Basin HCP.

> **Potential Impact Bio-1**: The Proposed Project may directly or indirectly impact special-status plant populations.

To reduce impacts to special-status plant populations to less than significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-1:** Conduct protocol-level special-status plant surveys in April and May within areas of non-native grassland and suitable wetlands with potential to support special-status plants, specifically at Well Sites 7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32, and 37. The surveys shall be performed in accordance with those described by resource experts and agencies (CNPS 2001, CDFW 2018a, USFWS 1996). If individuals or populations are observed, they shall be mapped and notes regarding size of population, quality of habitat and potential threats taken. Populations shall be avoided to the greatest extent practical, with a recommended minimum 25-foot buffer from the edge of the population. Prior to Project activities within the vicinity of the populations, the population and associated 25-foot buffer shall be flagged or otherwise made visible. No work shall occur within that flagged area and personnel shall avoid entering the area to the greatest extent practical.

If avoidance of a population or individual is not practical, a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted for the species being impacted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the species being impacted, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for either percent cover or number of individuals. The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

Implementation of this mitigation measure will reduce potential impacts to special-status plants to a level that is less than significant.

Swainson's Hawk

Swainson's hawk is a CESA-listed raptor that regularly nests in the vicinity of the Study Area. No permanent loss of SWHA habitat is anticipated due to the Proposed Project. It is anticipated that in Well Sites where potential foraging habitat is present, this habitat will remain at approximately the same extent and quality after the Project. During construction of the Project, some areas may be temporarily disturbed and SWHA may avoid the active construction areas at that time. No nesting trees for SWHA would be removed for the Project. If SWHA nests near a Well Site and construction activities are sufficient to disturb the active nest to the extent that the active nest was abandoned, this abandonment would be considered "take" under CESA. If no impact avoidance or minimization measures are implemented, direct mortality to dependent young could occur to individual SWHA present in these areas during construction. Because SWHA are listed as threatened under CESA, take of individuals is considered a **significant impact** under CEQA.

Potential Impact BIO-2: The Proposed Project's construction activities in the Well Sites could result in take of State-threatened SWHA, which would be considered a significant impact.

To reduce potential impacts to SWHA to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-2a: Initial ground disturbing activities will commence outside of the SWHA nesting season (March 1- September 15).

or

Mitigation Measure BIO-2b: If initial ground disturbing activities will commence during the SWHA nesting season (March 1- September 15), surveys based on CDFW's survey protocol shall be conducted. These surveys will include a pre-arrival assessment conducted between January 1 and March 1, to identify areas with suitable nesting sites within 0.25 miles of the Well Sites that will have activity in that year. The survey extent will include areas up to 0.5 miles for Well Sites located in the Natomas Basin Habitat Conservation Plan (NBHCP) area (Well Sites 15, 19, 20, 23 and 39). For Well Sites determined to have suitable nesting habitat within 0.25 miles or within 0.5 miles in the NBHCP area surveys will be conducted for SWHA nesting during the nest-building period (April 1-April 30) if work will begin between April 1 and May 30). For activities that will commence after June 1, surveys for active nests will be conducted between June 1 and August 1. Any active nests shall be avoided at a distance sufficient to ensure that nest abandonment will not occur and this distance shall be determined

through observation of the nest by a qualified biologist. Avoidance shall be maintained until dependent young are no longer present. Survey radius for these surveys shall be 0.25 miles except for sites within the NBHCP area, where survey radius shall extend 0.5 miles from the site.

Burrowing Owl

The Project may affect burrowing owl if present during Project development. Potential impacts to burrowing owl could occur during the removal of burrow-like structures. These activities could result in the direct removal or destruction of active nests or occupied refugia or may create audible, vibratory, and/or visual disturbances that cause birds to abandon active nests. Because burrowing owl are a CDFW SSC, harming a burrowing owl is a **potentially significant impact** under CEQA.

Potential Impact BIO-3: The Proposed Project's construction activities in the Well Sites could result in harm to burrowing owl, which would be considered a potentially significant impact.

To reduce potential impacts to burrowing owl to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-3: An assessment survey for burrowing owls shall be conducted at all well sites by a qualified biologist in the year of construction, prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) regardless of time of year. The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or ground disturbing activities if these activities commence between February 1 and August 31, the timeframe that corresponds to the burrowing owl nesting season. If the results of the surveys indicate that burrowing owl may be impacted by project activities or if the Well Site is in the NBHCP area, the following measure shall apply:

- Preconstruction surveys in accordance with CDFW (CDFG) burrowing owl guidelines shall be conducted, summarized as: The Project Area and surrounding area (up to 500 feet if habitat has potential to support burrowing owl and no barriers preclude burrowing owls) shall be traversed on foot to detect burrowing owls. The survey will be conducted using transects spaced no more than 50 feet apart. For sites determined to have potential to support nesting burrowing owls, at least 3 site visits for burrowing owl shall occur between April 15 and July 15, with at least one site visit after June 15. Visits are to be at least 15 days apart.
- If any burrowing owl nest is identified during preconstruction surveys, the applicant shall comply with all CDFW guidelines regarding the minimization of impacts to the burrowing owl, including not disturbing an occupied nest during nesting season (February 1 through August 31) unless a qualified biologist approved by the Department verifies through noninvasive methods that either:
  (1) the owls have not begun egg-laying and incubation; or
  (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
- Any owls identified in the preconstruction surveys shall be relocated to appropriate locations using passive relocation techniques approved by the CDFW and mitigation for impacts to

burrowing owl nests shall be provided and funded by the applicant in accordance with CDFW guidelines and requirements.

Valley elderberry longhorn beetle

The Project may affect VELB if present during Project development. Potential impacts to VELB could occur during the removal of its host plant, *Sambucus,* if occupied by VELB eggs, larvae or adult life stages. Because VELB are a Federal-threatened species, take of a VELB is a **significant impact** under CEQA.

> **Potential Impact BIO-4:** The Proposed Project's construction activities in the Well Sites could result in take of Federal-threatened VELB, which would be considered a significant impact.

To reduce potential impacts to VELB to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure BIO-4:** Prior to initial ground disturbance, a survey for the valley elderberry longhorn beetle (VELB) host plant, *Sambucus*, will be conducted at all sites where *Sambucus* has been detected (Well Sites 38 and 24) and all sites within the NBHCP. *Sambucus* plants, if detected, shall be avoided by at least 20 feet from the dripline of the plant and this avoidance buffer shall be clearly demarcated using lathe and flagging. If *Sambucus* plants with a stem diameter of greater than 1 inch cannot be avoided, they shall be inspected for evidence of VELB presence and if any evidence of VELB is detected, the plants shall be avoided and consultation with the USFWS shall occur to determine next steps, which may include relocation of the plant. If the Well Site where the *Sambucus* is located in the NBHCP, new consultation would not be required, but removal of *Sambucus* shall be conducted and mitigated for in accordance to the NBHCP.

Vernal Pool Fairy Shrimp (VPFS)

VPFS is a broad-ranging federal-listed vernal pool crustacean that occurs in wetlands, vernal pools and man-made features such as ditches. VPFS can occupy pools that contain water for around 3-4 weeks. If Project Activities were to impact habitats that are occupied by VPFS, this would be a **significant impact**.

> **Potential Impact BIO-5:** The Proposed Project's construction activities in the Well Sites could result in take of Federal-threatened VPFS, which would be considered a significant impact.

To reduce potential impacts to VPFS to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-5a: Ground disturbance activities at Well Sites 2, 24, 28, and 30 shall be conducted in the dry season (May through October) and work at other sites shall be in the dry season to

the greatest extent practical. Work within 200 feet of wetlands and ephemeral ditches will occur only in the dry season (June 1-October 31) and only in dry soils. Wetlands will be avoided by at least 100 feet and best management practices shall be implemented to prevent any potential increased erosion of sediment or turbid water from project activities into these features. If work is to be conducted from November through April, silt fencing shall be installed prior to ground disturbance around the perimeter and associated 25-foot buffer of avoided wetlands and the top of bank of drainage canals. Silt fencing adjacent to drainage canals shall be installed the greatest distance possible from the top of bank, while still maintaining prevention of runoff into the feature.

Or

Mitigation Measure BIO-5b: Prior to initial ground disturbance, protocol-level surveys for vernal pool fairy shrimp (VPFS) will be conducted at all sites where with potential to support VPFS (Well Sites 2, 24, 28, and 30). If VPFS are detected, and cannot be avoided, a permit for take coverage of the species, pursuant to the Federal Endangered Species Act will be acquired prior to commencement of Project Activities.

White-tailed Kite, Loggerhead Shrike and Common Nesting Birds

The Project may affect special-status birds including loggerhead shrike and white-tailed kite. In addition to special-status species, non-special-status native birds that are protected by the CFGC may also be impacted. Potential impacts to these species and their habitats could occur during the removal of vegetation or during ground-disturbing activities. These activities could result in the direct removal or destruction of active nests or may create audible, vibratory, and/or visual disturbances that cause birds to abandon active nests. Because nesting birds are protected by CFGC, destruction of an active nest or mortality of dependent young would be considered a **significant impact** under CEQA.

> **Potential Impact Bio-6**: The Proposed Project may directly or indirectly impact nesting birds, including special-status species.

To reduce impacts to nesting birds to less than significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-6:** A survey for active bird nests at all sites shall be conducted by a qualified biologist no more than 14 days prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) if ground disturbing activities commence during the nesting season (February 1 through August 31). The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or grading activities. For white-tailed kite, the survey area shall extend at least 0.25 miles from the area of potential disturbance. Based on the results of the pre-construction breeding bird survey, the following measure shall apply:
>
> - If active nests of protected species are found within the Well Site, or close enough to the area to affect nesting success, a work exclusion zone shall be established around each nest. Established exclusion zones shall remain in place until all young in the nest have fledged or the nest otherwise becomes inactive (e.g. due to predation). Appropriate exclusion zone sizes shall be established by a qualified biologist. Sizes of exclusion zones vary dependent upon bird species, nest location, existing visual buffers, ambient sound levels, and other factors; an exclusion zone radius may be as small as 25 feet (for common, disturbance-adapted species) or more than 250 feet for raptors.

Listed species are typically provided more extensive exclusion zones, which may be specific to the species and/or follow CDFW guidance. Exclusion zone size may also be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

7.2 Sensitive Land Cover Types

This section addresses the question:

> *b) Does the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;*

The Study Area contains two sensitive natural communities: seasonal wetlands and creeping ryegrass flat. The seasonal wetlands within the Study Area are under the jurisdiction of the RWQCB under Section 401 of the CWA and the Porter-Cologne Act. All but one feature, seasonal wetland at Well Site 2 are not under jurisdiction of the Corps under Section 404 of the CWA as they do not have direct connectivity to intermittent or perennial streams. The seasonal wetland at Well Site 2 is considered both RWQCB and Corps jurisdiction, and is thus described as a potential impact to Waters of the State and Waters of the U.S. Because seasonal wetlands are regulated by the RWQCB, impact to the community is considered a **potentially significant impact** under CEQA. Potential seasonal wetlands are present at Wells 2, 12, 13, 28, 29, 30, and 37. Project activities may directly or indirectly impact seasonal wetlands.

> **Potential Impact Bio-7**: Project activity may result in direct or indirect fill or discharge into seasonal wetlands.

To reduce potential impacts to potential seasonal wetlands to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-7a**: A wetland delineation shall be conducted at Well Sites 2, 12, 13, 28, 29 30 and 37 to collect information on the three wetland parameters at each of the potential wetlands, according to the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Arid West data forms shall be filled out and a report on the results will be provided. The report will provide the information and results of the delineation. A final jurisdictional determination shall be obtained from the Corps if deemed necessary.

> **Mitigation Measure Bio-7b**: Any wetlands within the Study Area shall be avoided to the greatest extent practical. A 25-foot buffer around the perimeter of each wetland shall be included and avoided. Prior to ground disturbance, the 25-foot buffer shall be clearly flagged by a qualified biologist. If wetlands cannot be avoided, appropriate permits shall be obtained from the appropriate regulatory agencies (e.g., RWQCB and Corps). Mitigation measures outlined in the permits shall be followed; however, mitigation ratios shall be no less than 1:1 for impacted

wetland acreage, which follows the City of Sacramento General Plan ER. 2.1.6, which requires on- or off-site preservation of equal amounts impacted. If impacts to seasonal wetlands shall occur, mitigation may include, but are not limited to on-site restoration/enhancement/creation, or purchase of credits at an approved mitigation bank. **Mitigation Measure Bio-5a** as described above shall also be implemented for the protection of wetlands.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

Creeping ryegrass flats, which is ranked as S3 by CDFW, is only located at Well Site 28 within the proposed activity area and associated 100-foot buffer. The S3 ranking by CDFW indicates this natural community is at a moderate risk of extirpation due to limited range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors (NatureServe 2020). Because this natural community is considered sensitive by CDFW due to reasons listed above, impact to the community is considered a **potentially significant impact** under CEQA.

Potential Impact Bio-8: The Proposed Project may directly or indirectly impact creeping ryegrass flats. This natural community is also a potential wetland as creeping ryegrass is a wetland indicator species. If a wetland delineation determines this area to be a wetland, Mitigation Measures Bio-7 above, shall be implemented.

If a wetland delineation determines this area to not be a wetland, to reduce potential impacts to creeping ryegrass flats to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure Bio-8: Prior to ground disturbance or staging of materials at Well 28, the edge of the creeping ryegrass flats and associated 10-foot buffer shall be flagged by a qualified biologist and shall be avoided. If Project activities cannot avoid the buffered area, then a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the creeping ryegrass flat, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for percent cover.
The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

Implementation of this mitigation measure will reduce this potential impact to a level that is ***less than significant***.

7.3 Aquatic Resources

This section analyzes the Project's potential impacts and mitigation for wetlands and other areas presumed or determined to be within the jurisdiction of the Corps or Regional Water Quality Control Board in reference to the significance threshold outlined in CEQA Appendix G, Part IV (c):

c) Does the Project have the potential to have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

Direct impacts to potential Section 404 wetlands located within the Study Area are avoided due to the preferential siting of project activities in areas that do not contain these features. Potential for indirect impacts exist at Wells 2, 24, 28, and 30, as areas of proposed activities and staging are located within 100-feet of a drainage canal or ditch and no levee is present between the feature and the activity areas. Furthermore, one seasonal wetland located at Well Site 2 is potentially impacted by well site activities, and due to its location adjacent to, and directly connected to a potential jurisdictional drainage canal this feature would be a jurisdictional Waters of the U.S. regulated by the Corps. Potential direct and indirect impacts to jurisdictional wetlands and non-wetland Waters of the U.S. are considered a **potentially significant impact** under CEQA.

> **Potential Impact Bio-9**: Project activity may result in unintentional fill or discharge into seasonal wetland, drainage canals or ditch.

To reduce potential impacts to streams to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measures Bio-5a, 7a-b**, as described above.

Implementation of these mitigation measure will reduce this potential impact to a level that is ***less than significant***.

7.4 Wildlife Corridors and Native Wildlife Nursery Sites

This section analyzes the Project's potential impacts and mitigation for habitat corridors and linkages in reference to the significance threshold outlined in CEQA Appendix G, Part IV (d):

> *d) Does the Project have the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*

No portions of the Study Area provide connectivity between areas of suitable habitat. For terrestrial species, all portions of the Study Area are within a greater context of urban development, and for aquatic species, there is no connectivity between the Study Area and upstream freshwater habitats. No impact will occur to migratory corridors for terrestrial and aquatic species.

Migratory birds may use portions of the Study Area opportunistically, however, the overwhelming majority of higher quality habitat along the Pacific Flyway exists outside the Study Area. Most of the Study Area is developed or supports disturbed habitats embedded in a highly urbanized setting. Based on these factors, proposed project will result in a **less than significant impact** to migratory corridors and habitat linkages.

7.5 Local Policies and Ordinances

This section analyzes the Project's potential impacts and mitigation based on conflicts with local policies and ordinances in reference to the significance threshold outlined in CEQA Appendix G, Part IV (e):

> *e) Does the Project have the potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;*

Local plans and policies related to biological resources examined in this analysis are:

- City of Sacramento Tree Ordinance
- City of Sacramento General Plan Wetland Protection

Potential Impact Bio-10a: Several potential wetlands are present within the Study Area and potential direct and indirect impacts may occur and are subject to the City of Sacramento General Plan ER. 2.1.6, which requires on- or off-site preservation of equal amounts of wetlands impacted.

To reduce potential impacts to wetlands to a less-than-significant level, the following measures shall be implemented: **Mitigation Measures Bio-5a, 7a-b**, as described above.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

The Project may require removal of trees covered by City of Sacramento Tree Ordinance for construction and/or access. All trees on City property qualify as City Trees, as described in Section 12.56.20. Removal of City Trees for public projects requires approval by the director, as outlined in Section 12.56.40. Based on site assessments, 16 of the sites (2, 3, 4, 5, 7, 8, 9, 16, 21, 23, 26, 27, 30, 32, 35, and 36) contain trees within the well activity area. Some or all of these tree may have regulated work conducted, as described in Section 12.56.20, as part of this public project. As City Trees are defined by a local ordinance, potential direct and indirect impacts are considered a **potentially significant impact** under CEQA.

> **Potential Impact Bio-10b**: Project activities may directly or indirectly impact City Trees as defined in the City Tree Ordinance.

To reduce potential impacts to City Trees to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-9:** For trees that cannot be avoided, any removal of City Trees shall follow the guidelines outlined in the Ordinance Section 12.56.40 and permits shall be acquired as outlined in Section 12.56.050.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

7.6 Habitat Conservation Plans

This section analyzes the Project's potential impacts and mitigation based on conflicts with any adopted local, regional, and state habitat conservation plans in reference to the significance threshold outlined in CEQA Appendix G, Part IV (f):

> *f) Does the Project have the potential to conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

Projects located within the NBHCP Area may obtain permits and mitigation coverage through payment of in-lieu fees to the NBHCP and the City of Sacramento is a participant in the HCP. Projects receiving permits through the NBHCP must also implement avoidance and minimization measures included in the NBHCP to reduce the potential for take of covered species. These measures are outlined in Chapter 5 of the NBHCP. The NBHCP requires that the area surrounding the Study Area be assessed to determine whether certain species and/or habitats that could potentially support special-status species are present. The area to be assessed ranges from a 200-foot radius surrounding the Study Area (for giant garter snake [*Thamnophis gigas*]) to a 0.5-mile radius surrounding the Study Area (for Swainson's hawk [*Buteo swainsoni*]).

The Study Area includes five Well Sites (15, 19, 20, 23, and 39) which are located within the NBHCP area. While the City may decide to implement provisions of the NBHCP for impacts that may occur to covered biological resources, no conflict with the NBHCP could be identified. Therefore, the Project would result in **no significant impact**.

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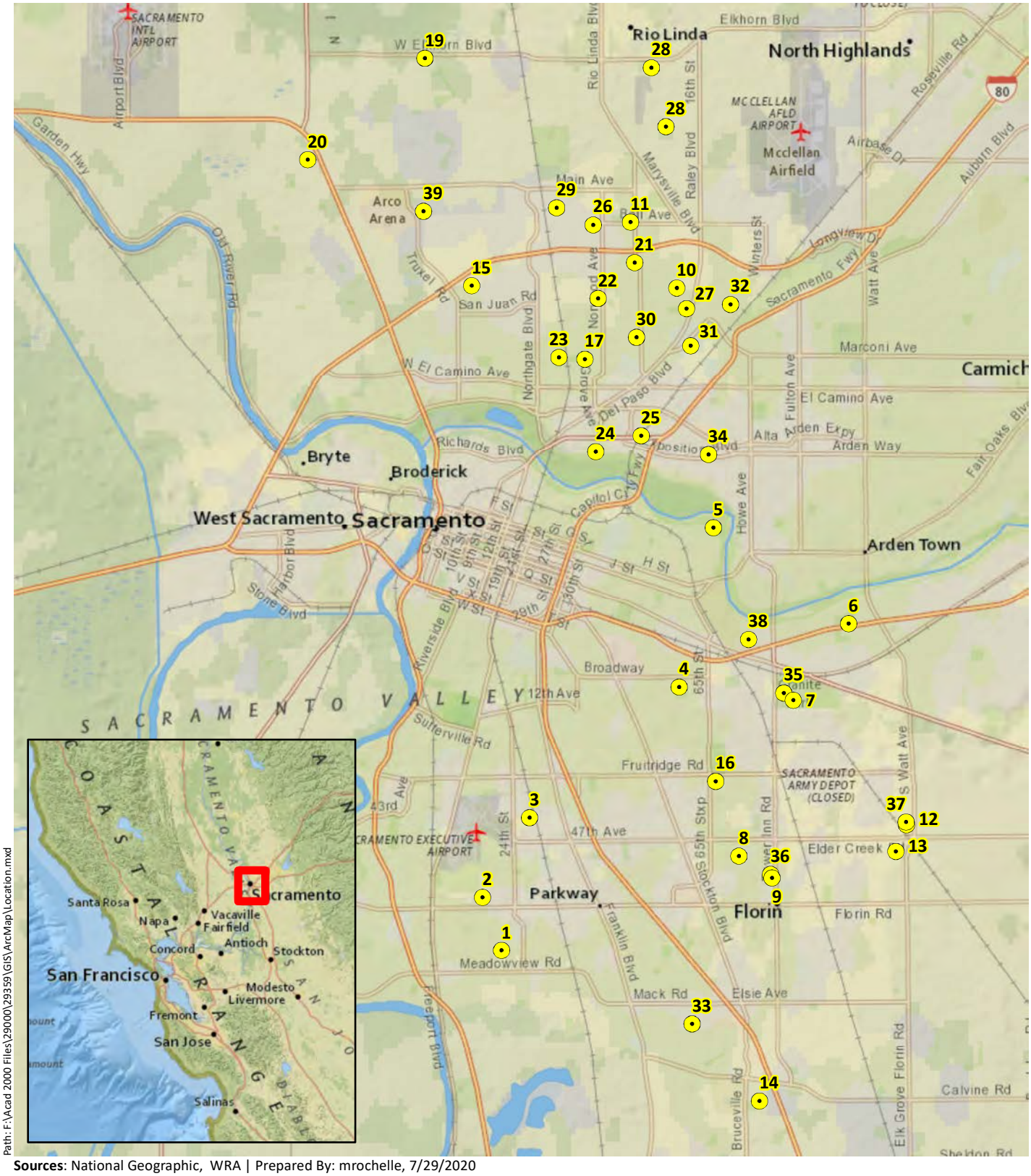
Appendix A -- Figures

Appendix A Figure 1 -- Location



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Sources: National Geographic, WRA | Prepared By: mrochelle, 7/29/2020

Figure 1. Regional Location Map

City of Sacramento Groundwater Master Plan
Sacramento County, California

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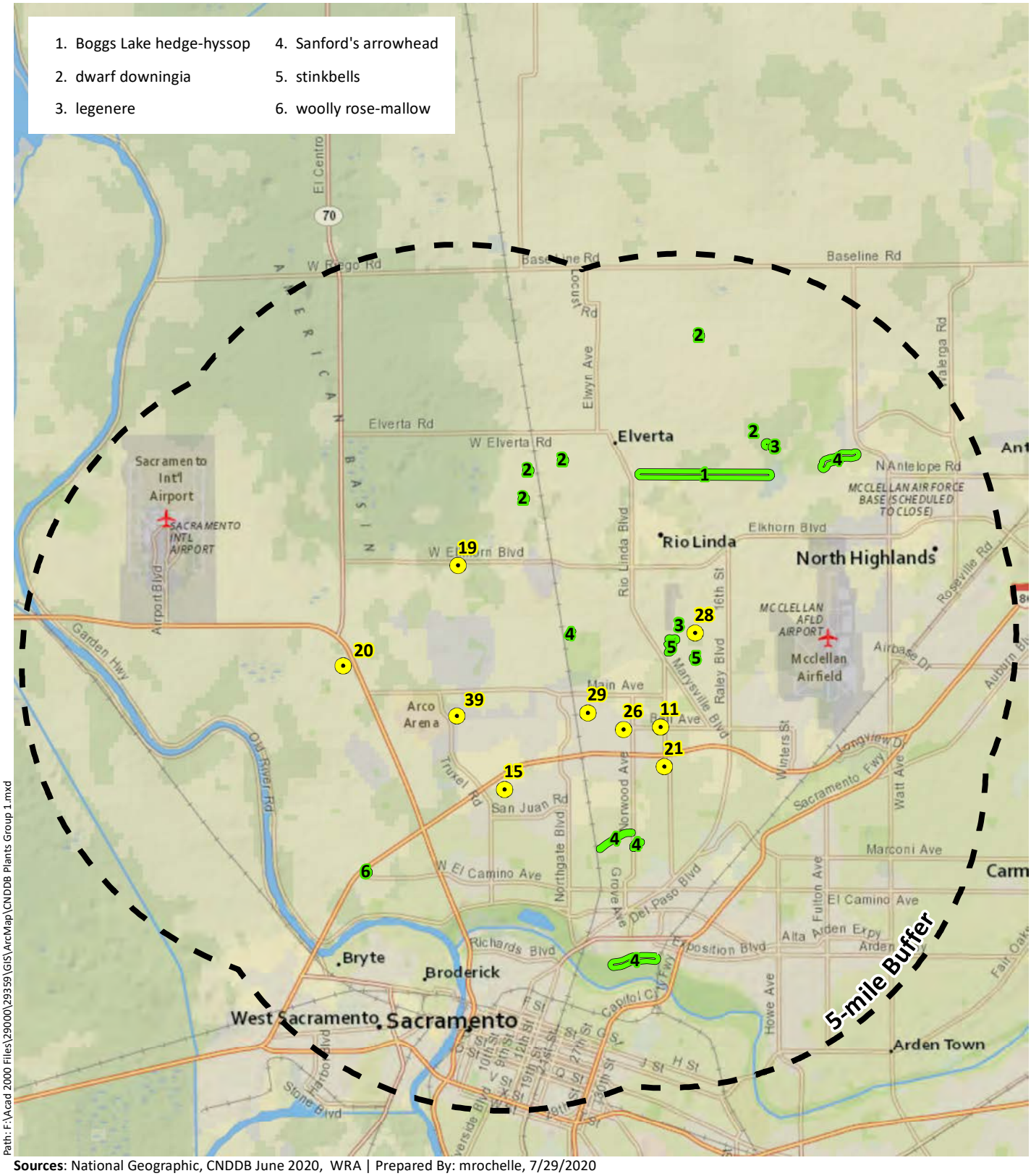
Appendix A -- Figure 2 Special-status Plants



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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2a. Special-Status Plant Species Documented within 5-miles (Well Sites 11,15,19,20,21,26,28,29,39)

City of Sacramento Groundwater Master Plan
Sacramento County, California

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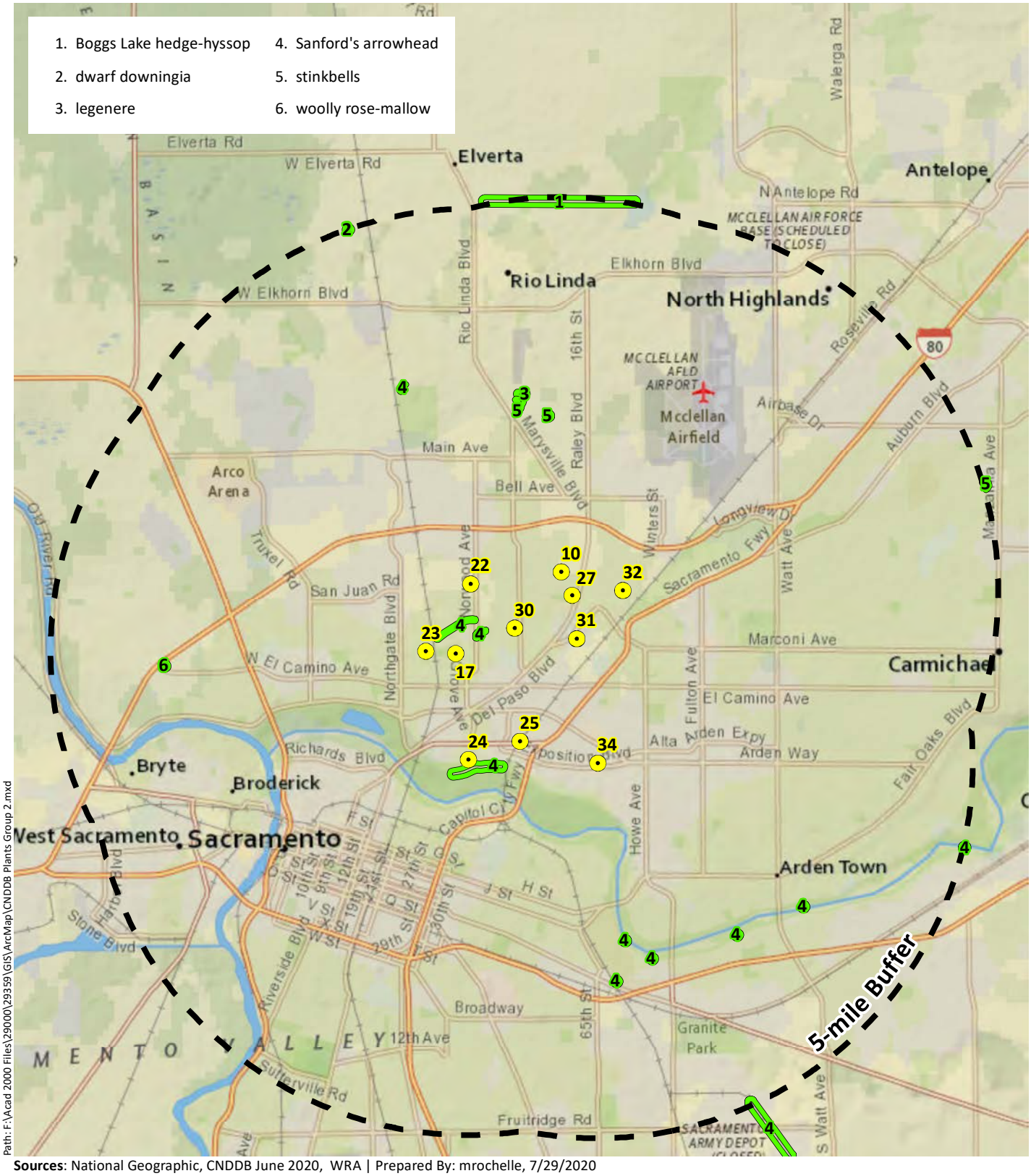

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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2b. Special-Status Plant Species Documented within 5-miles (Well Sites 10,17,22,23,24,25,27,30,31,32,34)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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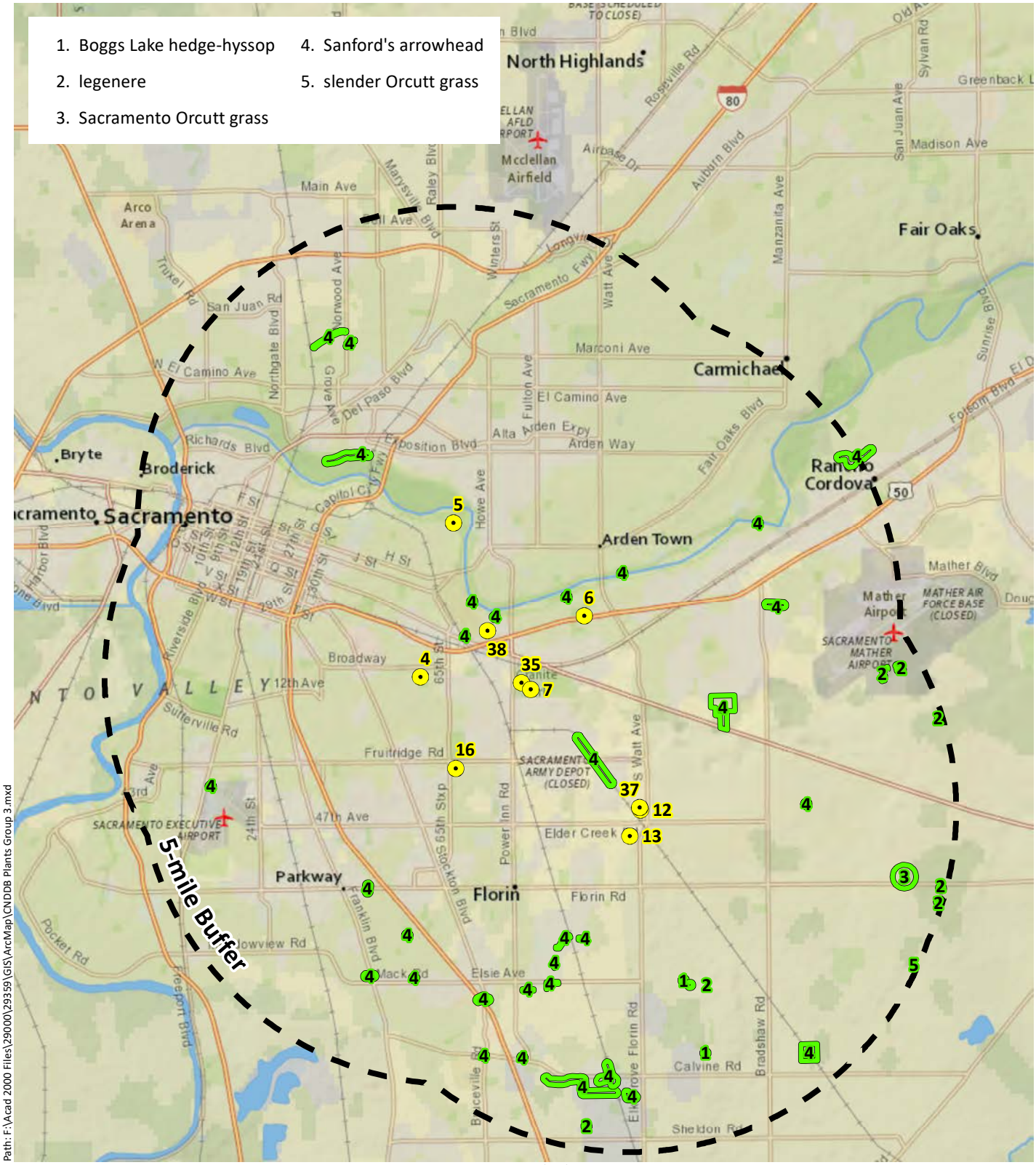

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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2c. Special-Status Plant Species Documented within 5-miles (Well Sites 4,5,6,7,12,13,16,35,37,38)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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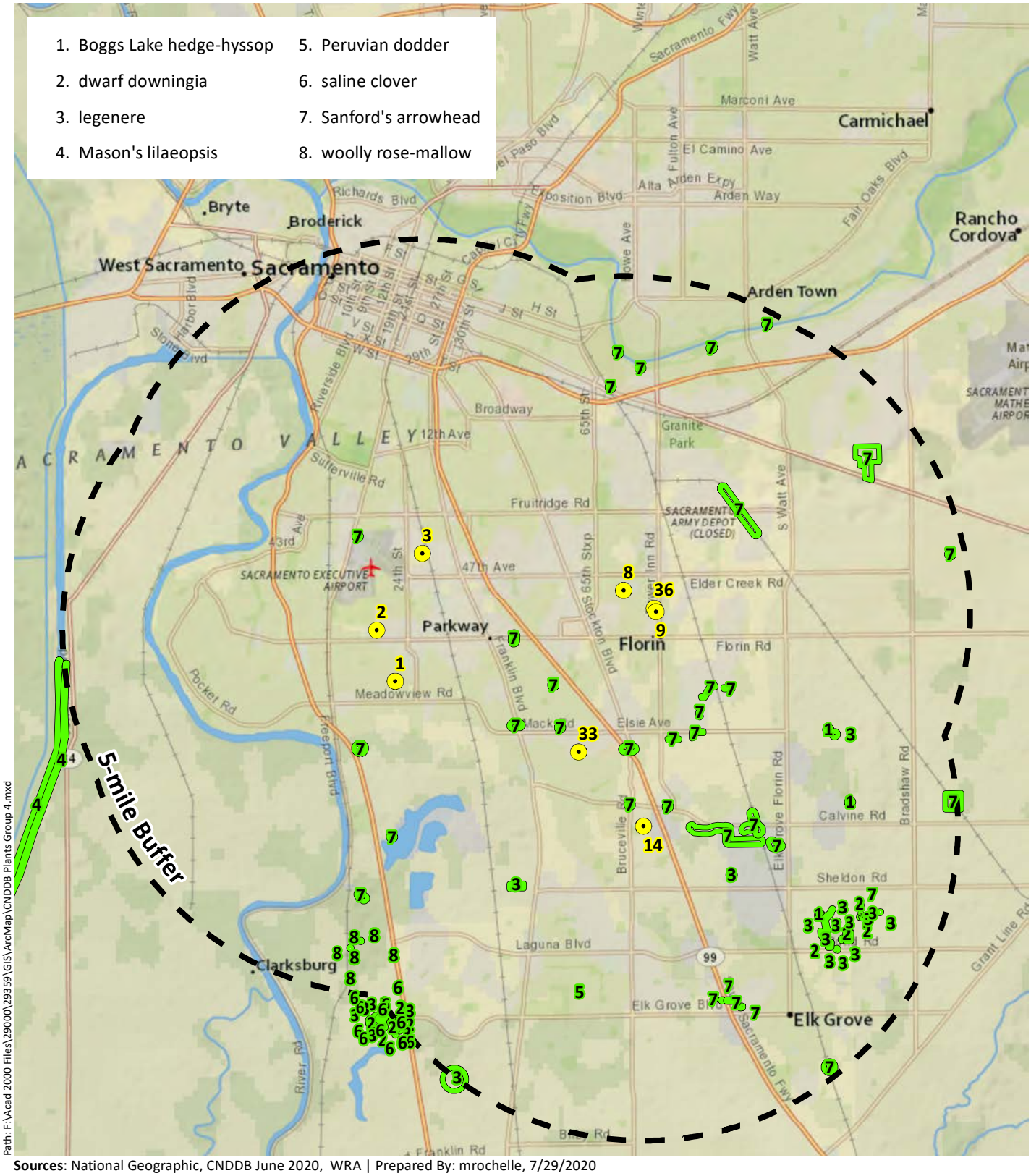

Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2d. Special-Status Plant Species Documented within 5-miles (Well Sites 1,2,3,8,9,14,33,36)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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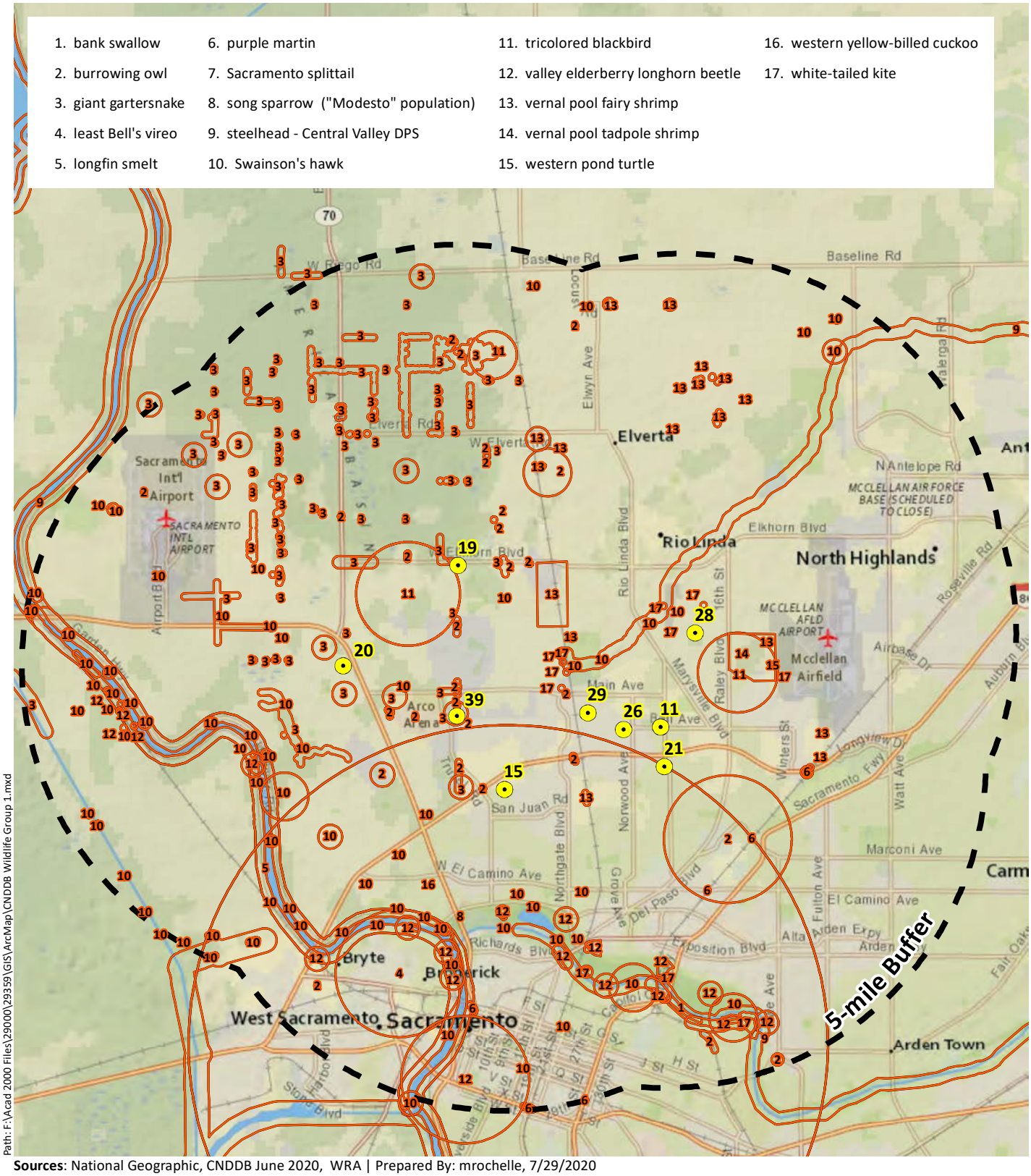
Appendix A -- Figure 3 Special -status Wildlife



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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 3a. Special-Status Wildlife Species Documented within 5-miles (Well Sites 11,15,19,20,21,26,28,29,39)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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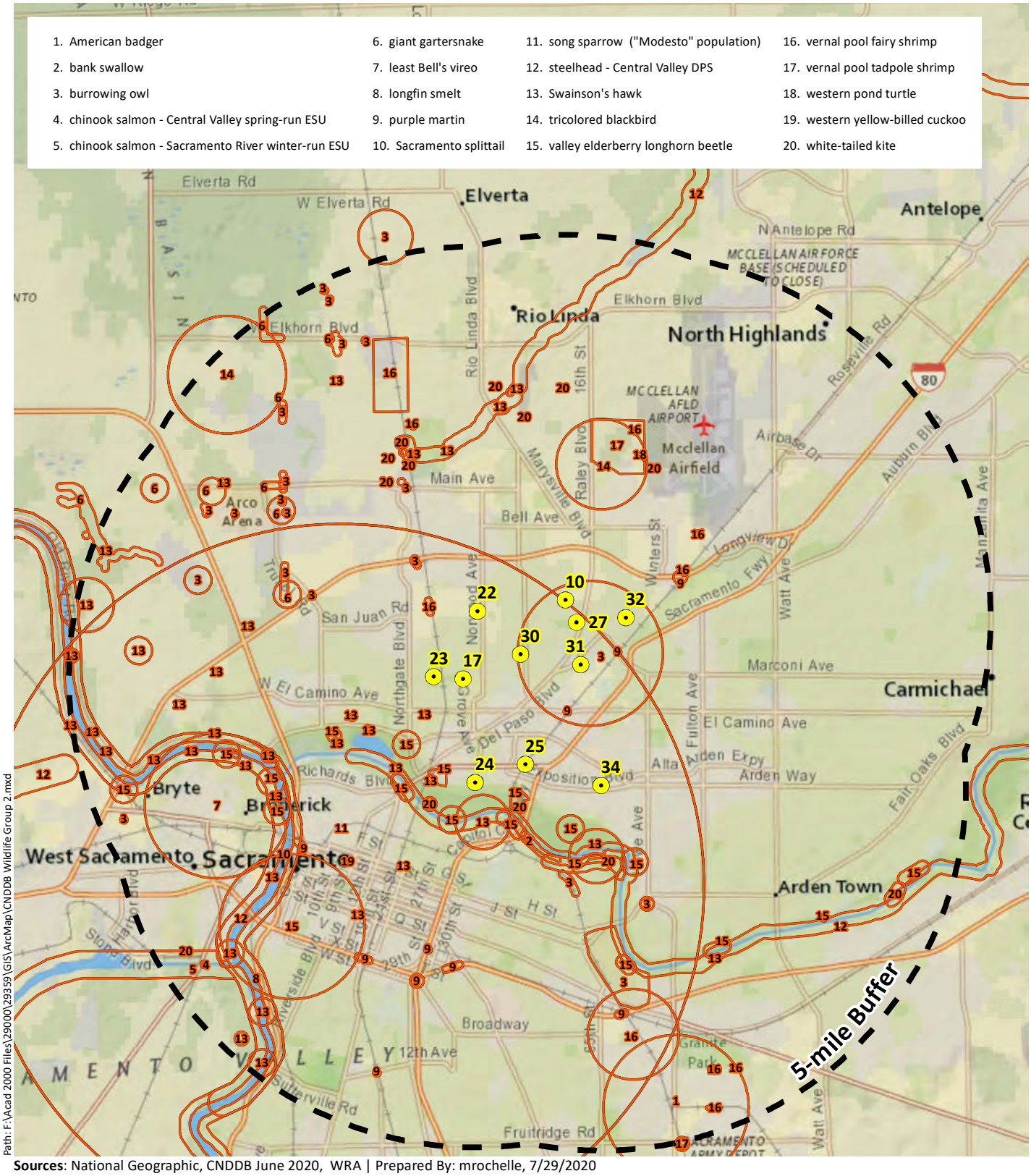

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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 3b. Special-Status Wildlife Species Documented within 5-miles (Well Sites 10,17,22,23,24,25,27,30,31,32,34)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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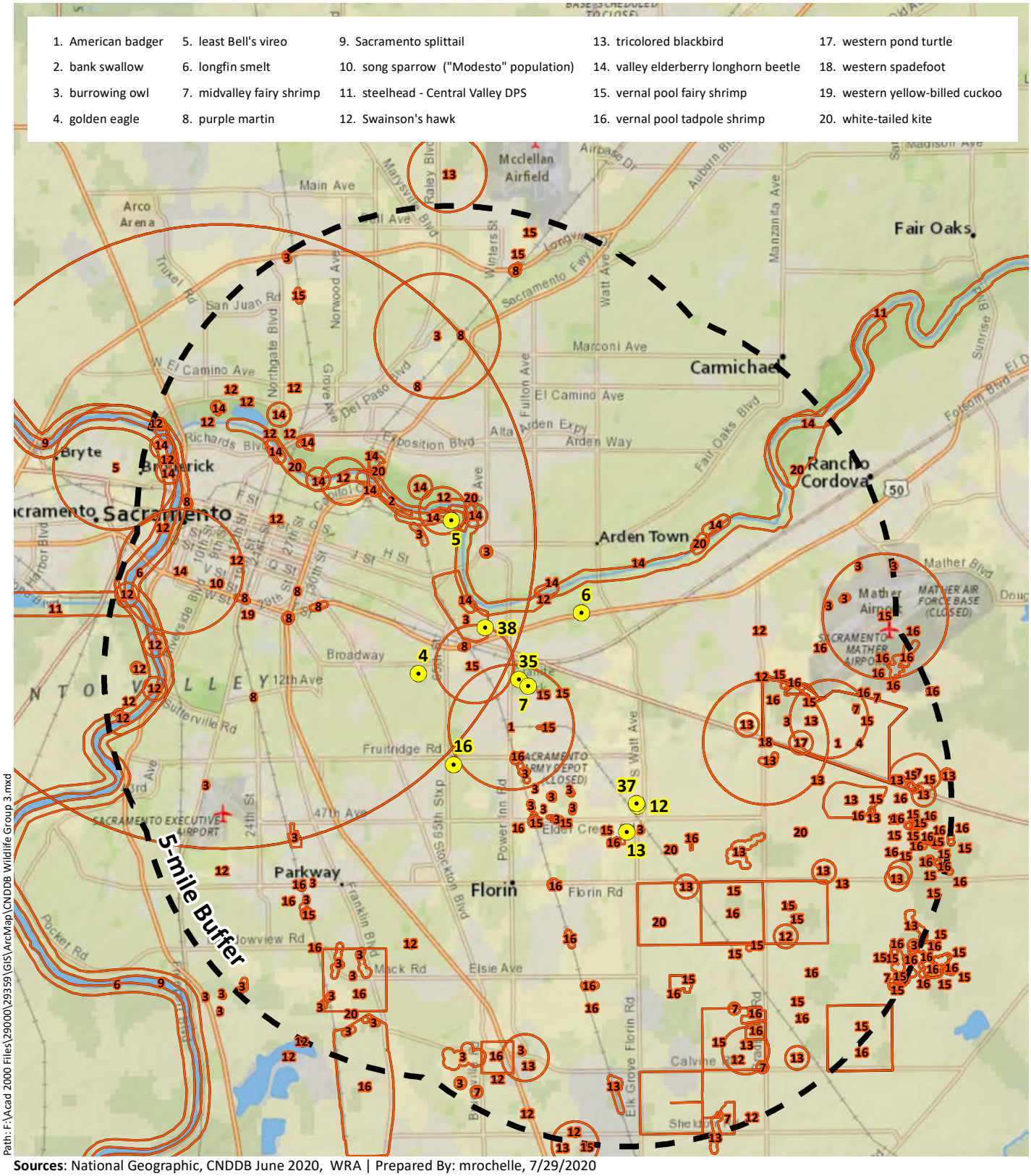

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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 3c. Special-Status Wildlife Species Documented within 5-miles (Well Sites 4,5,6,7,12,13,16,35,37,38)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

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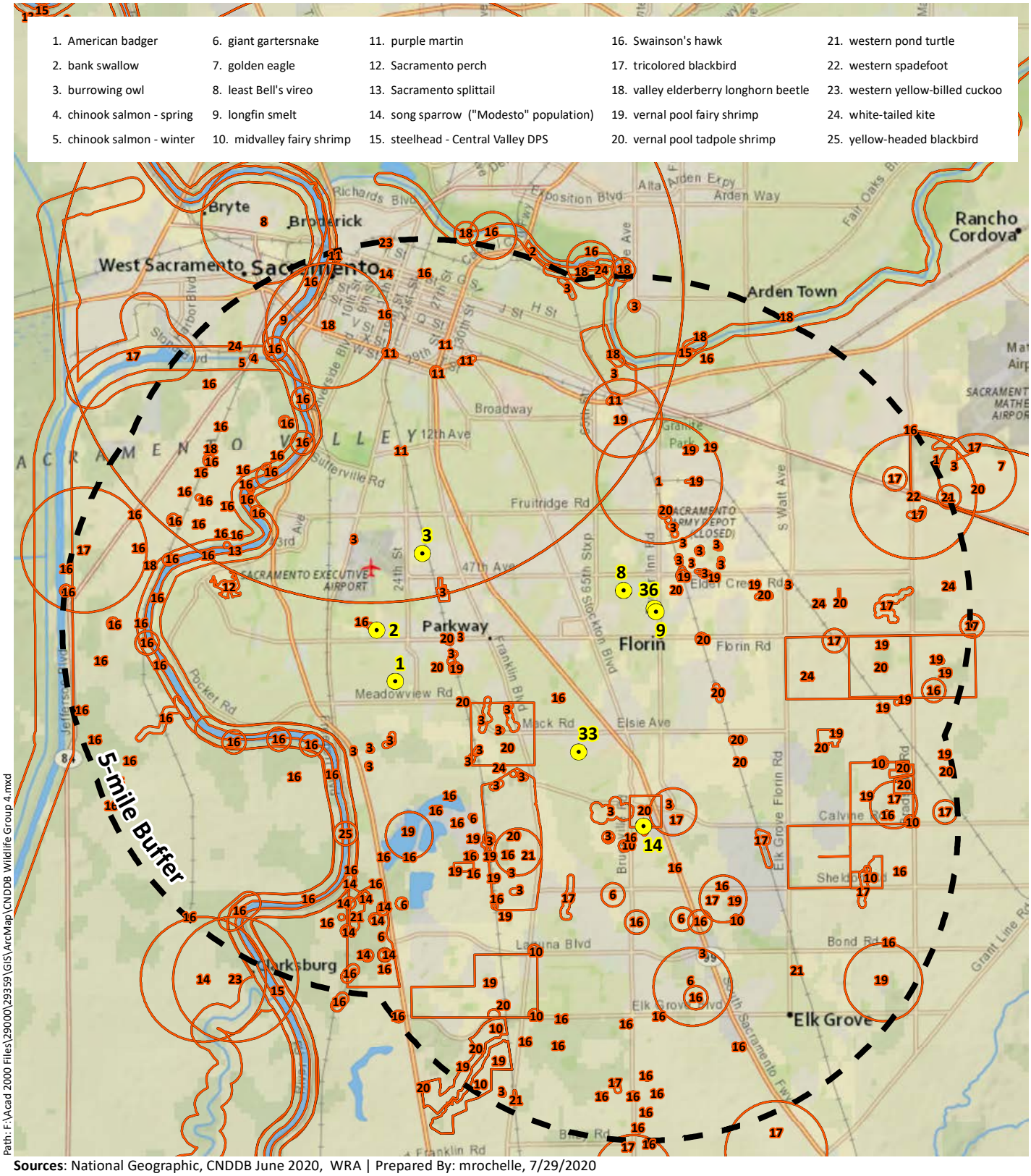


Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 3d. Special-Status Wildlife Species Documented within 5-miles (Well Sites 1,2,3,8,9,14,33,36)

City of Sacramento Groundwater Master Plan
Sacramento County, California

Appendix A -- Figure 4 Sensitive Land Cover

Figure 4a. Sensitive Land Cover Types in the Study Area (Well Site 2)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Ditch
Seasonal Wetland

N

0 50 100
Feet

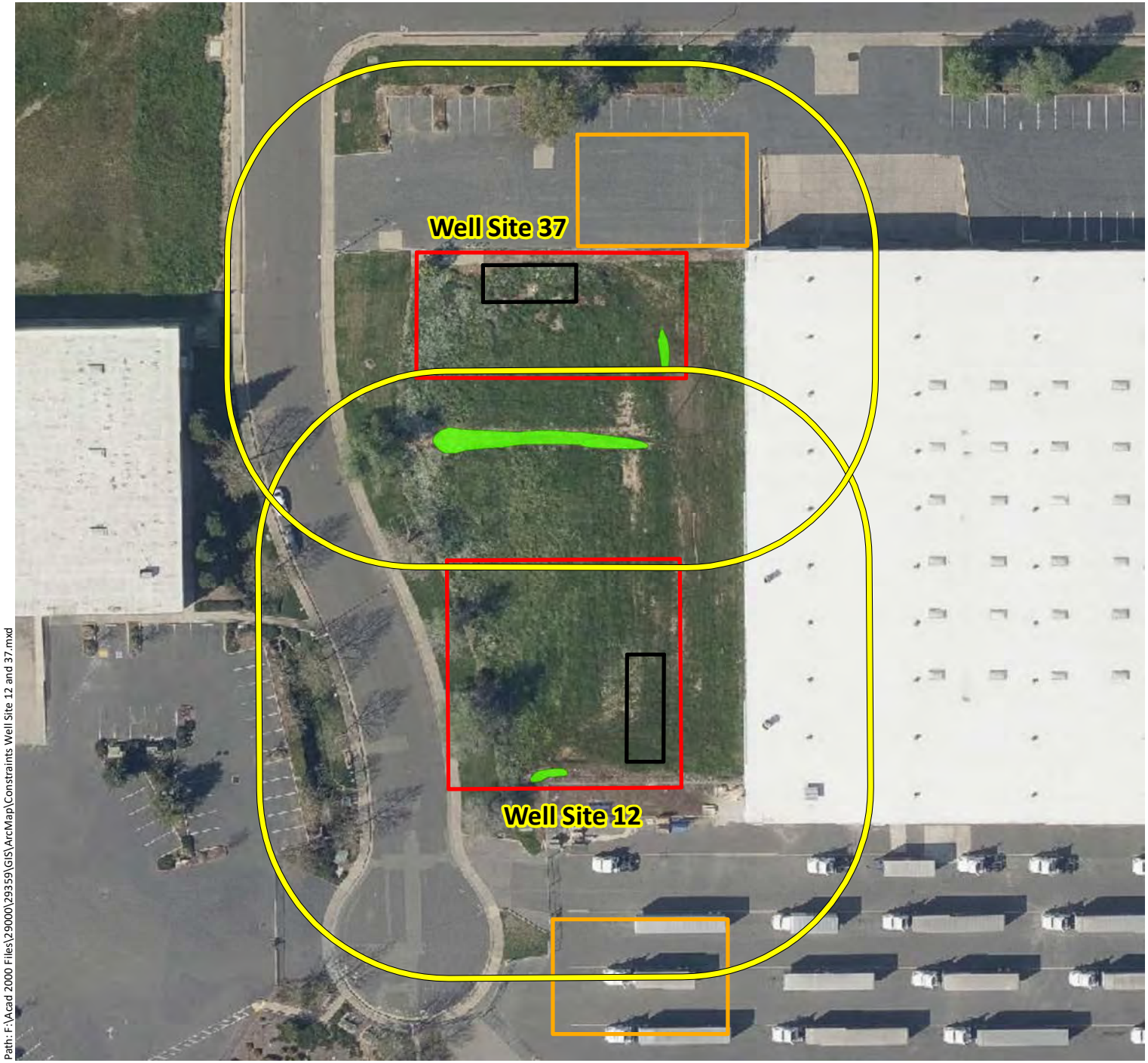
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 2.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4b. Sensitive Land Cover Types in the Study Area (Well Site 12 & 37)

City of Sacramento
Groundwater Master Plan
Sacramento County, California



Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sesnsitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

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ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 12 and 37.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4c. Sensitive Land Cover Types in the Study Area (Well Site 13)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 13.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4d. Sensitive Land Cover Types in the Study Area (Well Site 24)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Drainage Canal

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 24.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

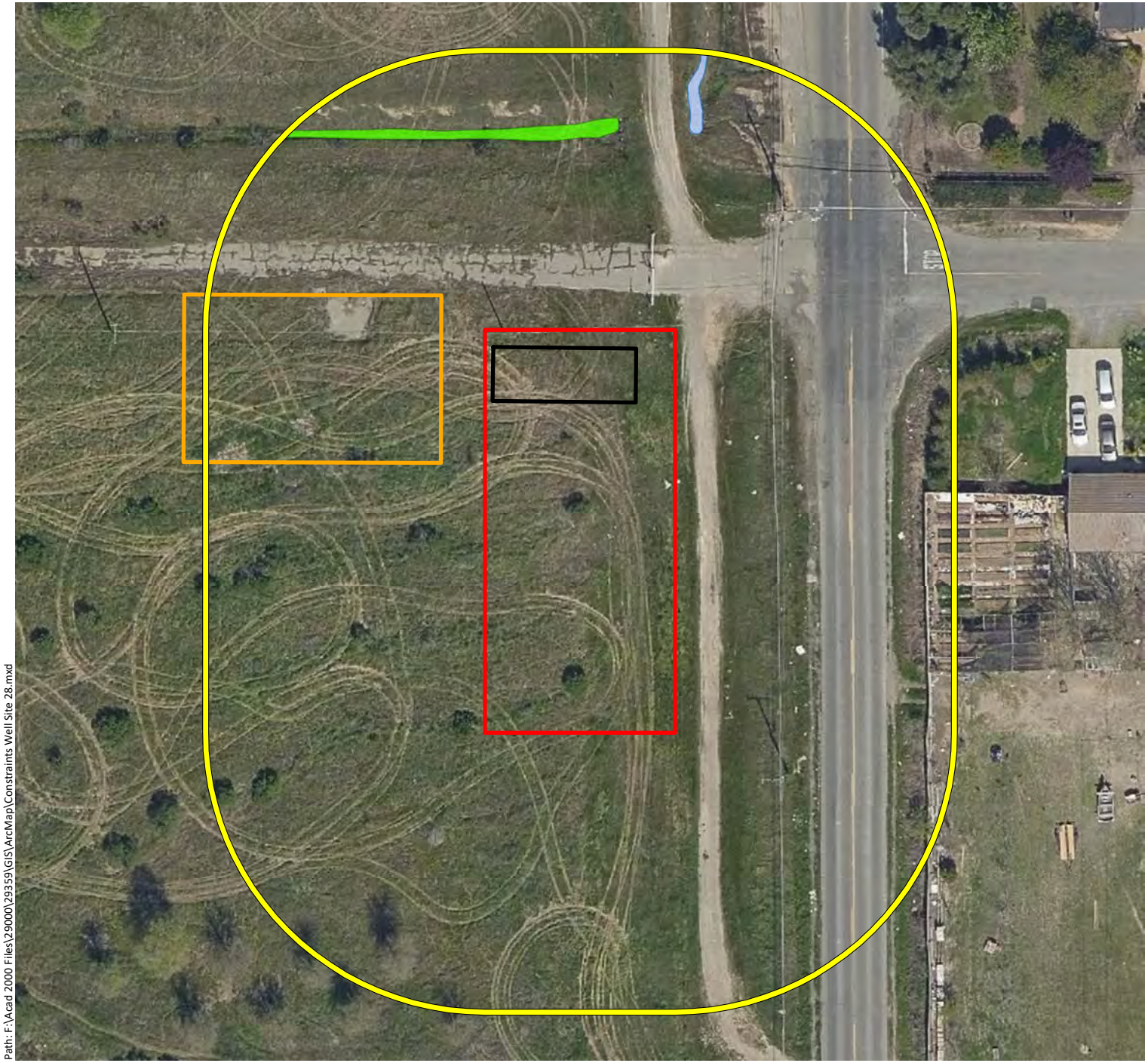


Figure 4e. Sensitive Land Cover Types in the Study Area (Well Site 28)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Ditch
Seasonal Wetland

N

0 50 100
Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 28.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4f. Sensitive Land Cover Types in the Study Area (Well Site 29)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 29.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

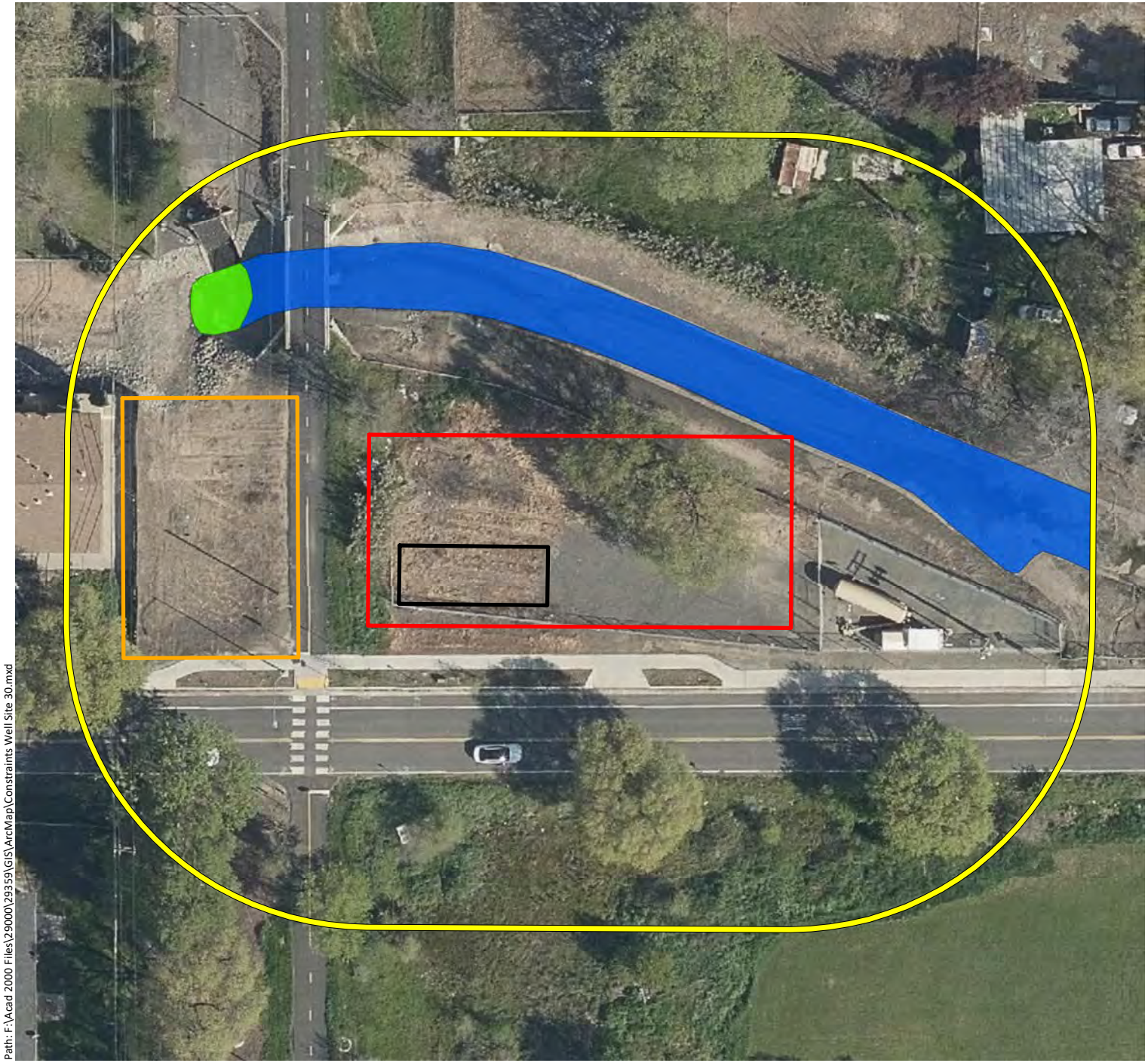


Figure 4g. Sensitive Land Cover Types in the Study Area (Well Site 30)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover

Seasonal Wetland
Drainage Canal

N

0 50 100

Feet

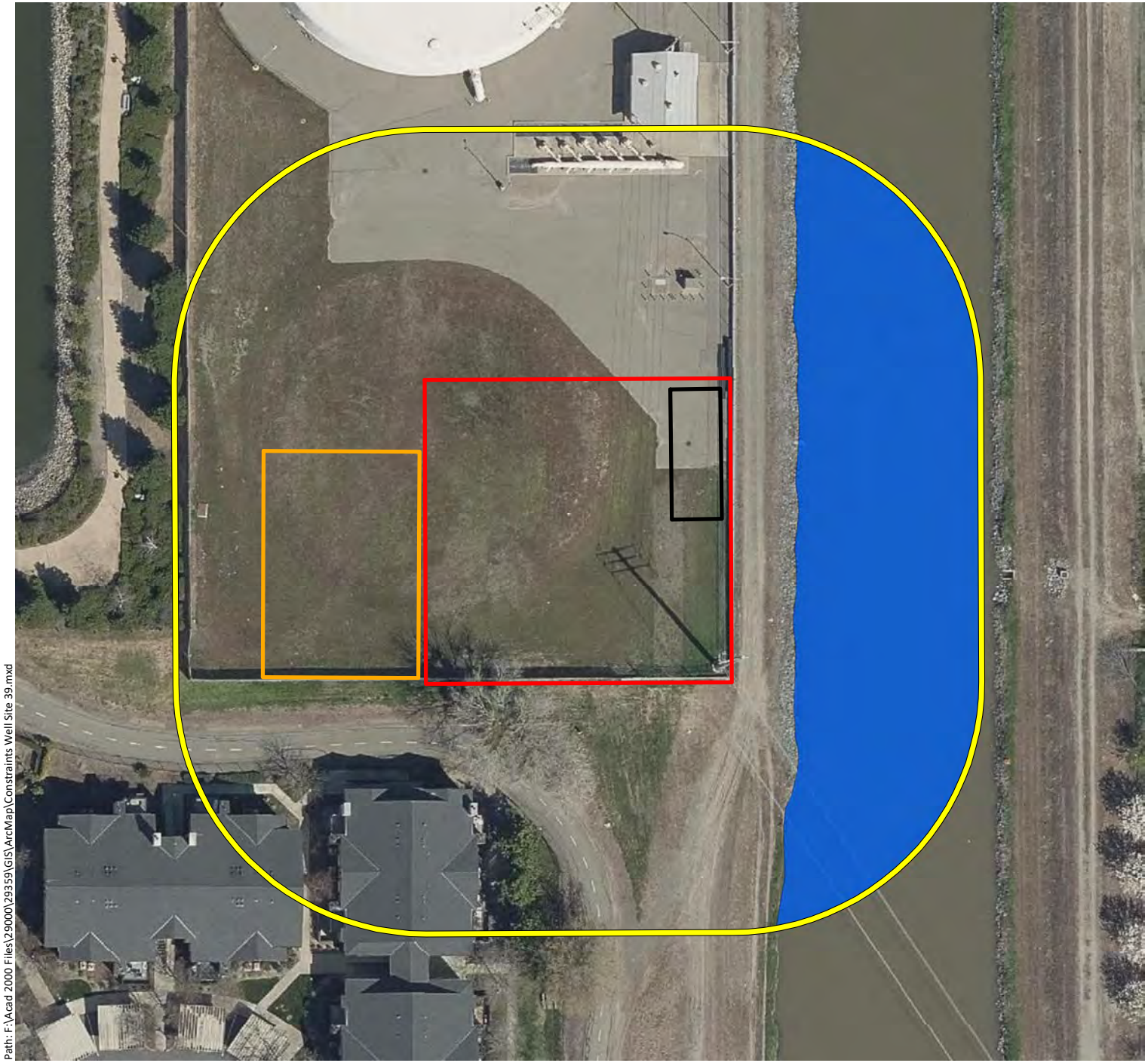
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 30.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4h. Sensitive Land Cover Types in the Study Area (Well Site 39)

City of Sacramento
Groundwater Master Plan
Sacramento County, California



Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover

Drainage Canal

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 39.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Appendix B -- Observed Species

Appendix B. Plant species observed in the Study Area

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Azolla sp.	-	-	-	-	-	-
Baccharis pilularis	Coyote brush	native	shrub	-	-	-
Bromus catharticus	Rescue grass	non-native	annual, perennial grass	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Bromus tectorum	Cheat grass	non-native (invasive)	annual grass	-	High	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU
Cerastium glomeratum	Large mouse ears	non-native	annual herb	-	-	UPL
Chenopodium sp.	-	-	-	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-
Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW
Deschampsia danthonioides	Annual hairgrass	native	annual grass	-	-	FACW
Digitaria sp.	-	-	-	-	-	-
Dittrichia graveolens	Stinkwort	non-native (invasive)	annual herb	-	Moderate	-
Echinochloa crus-galli	Barnyard grass	non-native	annual grass	-	-	FACW
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	-
Erigeron bonariensis	Flax-leaved horseweed	non-native	annual herb	-	-	FACU
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Erodium brachycarpum	White stemmed filaree	non-native	annual herb	-	-	-
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-
Euphorbia maculata	Spotted spurge	non-native	annual herb	-	-	UPL
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW
Festuca bromoides	Brome fescue	non-native	annual grass	-	-	FACU
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC
Hedera helix	English ivy	non-native (invasive)	vine, shrub	-	High	FACU
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Holocarpha virgata	Narrow tarplant	native	annual herb	-	-	-
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
Juncus bufonius	Common toad rush	native	annual grasslike herb	-	-	FACW
Juncus mexicanus	Mexican rush	native	perennial grasslike herb	-	-	FACW
Kickxia elatine	Sharp point fluellin	non-native	perennial herb	-	-	UPL
Lactuca saligna	Willow lettuce	non-native	annual herb	-	-	UPL
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU
Lagerstroemia indica	crepe myrtle	non-native	tree	-	-	-
Leptochloa fusca	Sprangletop	native	annual grass	-	-	FACW
Lonicera japonica	Japanese honeysuckle	non-native	vine, shrub	-	-	FACU
Lotus corniculatus	Bird's foot trefoil	non-native	perennial herb	-	-	FAC
Ludwigia peploides	Marsh purslane	non-native (invasive)	perennial herb	-	High	OBL

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Ludwigia sp.	-	-	-	-	-	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL
Malva parviflora	Cheeseweed	non-native	annual herb	-	-	-
Malva sp.	-	-	-	-	-	-
Malvella leprosa	Alkali mallow	native	perennial herb	-	-	FACU
Oxalis corniculata	Creeping wood sorrel	non-native	perennial herb	-	-	FACU
Paspalum dilatatum	Dallis grass	non-native	perennial grass	-	-	FAC
Persicaria sp.	-	-	-	-	-	-
Phalaris paradoxa	Hood canarygrass	non-native	annual grass	-	-	FAC
Phyla nodiflora	Common lippia	native	perennial herb	-	-	FACW
Pinus ponderosa	Ponderosa pine	native	tree	-	-	FACU
Pistacia chinensis	Chinese pistache	non-native	tree	-	-	-
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC
Plantago major	Common plantain	non-native	perennial herb	-	-	FAC
Platanus racemosa	California sycamore	native	tree	-	-	FAC
Platanus x *racemosa*	London plane	non-native	tree	-	-	-
Poa annua	Annual blue grass	non-native	annual grass	-	-	FAC
Polygonum aviculare	Prostrate knotweed	non-native	annual, perennial herb	-	-	FAC
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC
Portulaca oleracea	Common purslane	non-native	annual herb	-	-	FAC
Prunella vulgaris	Self heal	native	perennial herb	-	-	FACU
Pyracantha sp.	-	-	-	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU
Quercus suber	Cork oak	non-native	tree	-	-	-
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Robinia pseudoacacia	Black locust	non-native (invasive)	tree	-	Limited	FACU
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Salsola tragus	Russian thistle	non-native (invasive)	annual herb	-	Limited	FACU
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC
Scleranthus annuus ssp. *annuus*	German knotgrass	non-native	annual herb	-	-	FACU
Sequoia sempervirens	Coast redwood	native	tree	-	-	-
Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-
Sorghum halepense	Johnsongrass	non-native	perennial grass	-	-	FACU
Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC
Taraxacum officinale	Red seeded dandelion	non-native	perennial herb	-	-	FACU
Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	Limited	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL
Trifolium fragiferum	Strawberry clover	non-native	perennial herb	-	-	FAC
Trifolium repens	White clover	non-native	perennial herb	-	-	FACU
Triticum aestivum	Common wheat	non-native	annual grass	-	-	-
Veronica peregrina ssp. *xalapensis*	Speedwell	native	annual herb	-	-	FAC
Vicia sativa	Spring vetch	non-native	annual herb, vine	-	-	FACU
Vicia villosa	Hairy vetch	non-native	annual herb, vine	-	-	-

All species identified using the *Jepson Manual, 2nd Edition* (Baldwin et al. 2012) and *A Flora of Sonoma County* (Best et al. 1996); nomenclature follows *The Jepson Flora Project* (eFlora 2018) unless otherwise noted

Sp.: “species”, intended to indicate that the observer was confident in the identity of the genus but uncertain which species
Cf.: intended to indicate a species appeared to the observer to be specific, but was not identified based on diagnostic characters

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2018)

FE:	Federal Endangered
FT:	Federal Threatened
SE:	State Endangered
ST:	State Threatened
SR:	State Rare
Rank 1A:	Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere
Rank 2A:	Plants presumed extirpated in California, but more common elsewhere
Rank 2B:	Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3:	Plants about which we need more information – a review list
Rank 4:	Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)

High:	Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate:	Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited- moderate distribution ecologically
Limited:	Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed:	Assessed by Cal-IPC and determined to not be an existing current threat

[3]Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

OBL:	Almost always a hydrophyte, rarely in uplands
FACW:	Usually a hydrophyte, but occasionally found in uplands
FAC:	Commonly either a hydrophyte or non-hydrophyte
FACU:	Occasionally a hydrophyte, but usually found in uplands
UPL:	Rarely a hydrophyte, almost always in uplands
NL:	Rarely a hydrophyte, almost always in uplands
NI:	No information; not factored during wetland delineation

Appendix C -- Species Potential Table

Appendix C. Potential for special-status plant and wildlife species to occur in the Study Area. List compiled from the U.S. Fish and Wildlife Service (USFWS) IPaC Trust Report, Natomas Basin Habitat Conservation Plan, and a search of the California Department of Fish and Wildlife Natural Diversity Database (CDFW 2020) and the California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2020a) for the Taylor Monument, Citrus Heights, Rio Linda, Florin, Carmichael, Sacramento West, Elk Grove, Clarksburg, and Sacramento East U.S. Geological Survey 7.5' quadrangles (USGS 2018a-i). A review of historical and current satellite imagery (Google Earth 2020, Historical Aerials 2020), and a review of other CDFW and USFWS lists and publications (Shuford and Gardali 2008, Tomson et al. 2016, USFWS 2008).

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Plants				
Ferris' milk-vetch *Astragalus tener var. ferrisiae*	Rank 1B.1	Meadows and seeps (vernally mesic), valley and foothill grassland (subalkaline flats). Elevation ranges from 5 to 245 feet (2 to 75 meters). Blooms Apr-May.	**Unlikely**. The Study Area does not contain subalkaline flats or vernally mesic meadows or seeps.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
valley brodiaea *Brodiaea rosea ssp. vallicola*	Rank 4.2	Valley and foothill grassland (swales), vernal pools. Elevation ranges from 30 to 1100 feet (10 to 335 meters). Blooms Apr-May(Jun).	**Moderate Potential.** The Study Area contains grassland habitat; however vernal pools are absent.	Protocol-level survey should be conducted in May to determine presence. See Section 7.1 for further recommendations.
bristly sedge *Carex comosa*	Rank 2B.1	Coastal prairie, marshes and swamps (lake margins), valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	**Unlikely**. While the Study Area contains stream margins, these areas provide limited potential habitat due to disturbance. Additionally, no individuals were observed during the site visit conducted in June.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**Moderate Potential**. The Study Area contains vernally mesic grasslands. Additionally, this species is known to occur in disturbed areas.	**Not Observed**. The species was not observed during the June survey and is determined absent from the Study Area.
Parry's rough tarplant *Centromadia parryi ssp. rudis*	Rank 4.2	Valley and foothill grassland, vernal pools. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms May-Oct.	**Moderate Potential**. The Study Area contains vernally mesic grasslands. Additionally, this species is known to occur in disturbed areas.	**Not Observed**. The species was not observed during the June survey and is determined absent from the Study Area.
Peruvian dodder *Cuscuta obtusiflora var. glandulosa*	Rank 2B.2	Marshes and swamps (freshwater). Elevation ranges from 45 to 920 feet (15 to 280 meters). Blooms Jul-Oct.	**Unlikely**. The Study Area does not contain freshwater marsh habitat. Additionally, no *Cuscuta* spp. was observed during the June site visit.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
dwarf downingia *Downingia pusilla*	Rank 2B.2	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 0 to 1460 feet (1 to 445 meters). Blooms Mar-May.	**Moderate Potential**. The Study Area contains mesic grasslands in isolated depressions with known associated species.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
stinkbells *Fritillaria agrestis*	Rank 4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland. Elevation ranges from 30 to 5100 feet (10 to 1555 meters). Blooms Mar-Jun.	**Moderate Potential**. The Study Area contains grassland habitat; additionally, this species is known to occur in non-native grassland habitat.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE, Rank 1B.2, Natomas Basin HCP	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	**No Potential**. The Study Area does not contain vernal pool habitat and mesic grasslands are dominated by aggressive non-native species which likely preculdes this diminutive annual species.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
hogwallow starfish *Hesperevax caulescens*	Rank 4.2	Valley and foothill grassland (mesic, clay), vernal pools (shallow). Elevation ranges from 0 to 1655 feet (0 to 505 meters). Blooms Mar-Jun.	**No Potential**. The Study Area does not contain vernal pool habitat and mesic grasslands are dominated by aggressive non-native species which likely preculdes this diminutive annual species.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
woolly rose-mallow *Hibiscus lasiocarpos var. occidentalis*	Rank 1B.2	Marshes and swamps (freshwater). Elevation ranges from 0 to 395 feet (0 to 120 meters). Blooms Jun-Sep.	**No Potential**. The Study Area does not contain freshwater marsh habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Ahart's dwarf rush *Juncus leiospermus var. ahartii*	Rank 1B.2	Valley and foothill grassland (mesic). Elevation ranges from 95 to 750 feet (30 to 229 meters). Blooms Mar-May.	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	Rank 1B.2, Natomas Basin HCP	Marshes and swamps (freshwater and brackish). Elevation ranges from 0 to 15 feet (0 to 5 meters). Blooms May-Jul (Aug-Sep).	**No Potential.** The Study Area does not contain marsh habitat.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
legenere *Legenere limosa*	Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Heckard's pepper-grass *Lepidium latipes var. heckardii*	Rank 1B.2	Valley and foothill grassland (alkaline flats). Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Mar-May.	**Unlikely**. The Study Area does not contain alkaline flats.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
Mason's lilaeopsis *Lilaeopsis masonii*	SR, Rank 1B.1	Marshes and swamps (brackish or freshwater), riparian scrub. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Nov.	**No Potential**. The Study Area does not contain tidal zones along streams.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
hoary navarretia *Navarretia eriocephala*	Rank 4.3	Cismontane woodland, valley and foothill grassland. Elevation ranges from 340 to 1310 feet (105 to 400 meters). Blooms May-Jun.	**Moderate Potential**. The Study Area contains mesic grassland habitat.	Protocol-level survey should be conducted in May to determine presence. See Section 7.1 for further recommendations.
Colusa grass *Neostapfia colusana*	FT, CE, Rank 1B.1, Natomas Basin HCP	Vernal pools (large on adobe soil). Elevation ranges from 15 to 600 feet (5 to 200 meters) Blooms May-Aug.	**No Potential.** The Study Area does not contain vernal pool habitat. Additionally, the species was not observed during the June survey.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
slender Orcutt grass *Orcuttia tenuis*	FT, SE, Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May-Sep(Oct).	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Sacramento Orcutt grass *Orcuttia viscida*	FE, SE, Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 95 to 330 feet (30 to 100 meters). Blooms Apr-Jul(Sep).	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Sanford's arrowhead *Sagittaria sanfordii*	Rank 1B.2, Natomas Basin HCP	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 0 to 2135 feet (0 to 650 meters). Blooms May-Oct(Nov).	**No Potential**. The Study Area does not contain ponds or marsh habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Suisun Marsh aster *Symphyotrichum lentum*	Rank 1B.2	Marshes and swamps (brackish and freshwater). Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms (Apr)May-Nov.	**No Potential**. The Study Area does not contain slough habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**Moderate Potential**. The Study Area contains vernally mesic grasslands with known associated species. However, no individuals were observed during the June site visit.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mammals				
ringtail (ring-tailed cat) *Bassariscus astutus*	CFP	Is widely distributed throughout most of California, but absent from some portions of the Central Valley and northeastern California. The species is nocturnal, primarily carnivorous and is associated with a mixture of dry forest and shrubland in close association with rocky areas and riparian habitat, using hollow trees and cavities for shelter.	**No Potential.** The Study Area and adjacent areas do not contain forest, shrubland, or riparian habitats to support this species.	No further actions are recommended for this species.
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Unlikely.** Ruderal herbaceous areas within the Study Area has been regularly disked and/or lacks connectivity to expansive habitats.	No further actions are recommended for this species.
pallid bat *Antrozous pallidus*	SSC, WBWG High	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, barns, and human-occupied as well as vacant buildings. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Moderate Potential.** This species may occasionally fly over the Study Area and may occasionally roost in the Study Area, but there are no trees that would support maternity roosts.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
western red bat *Lasiurus blossevillii*	SSC, WBWG High	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores).	**Moderate Potential.** This species may occasionally fly over the Study Area and may occasionally roost in the Study Area, but there are no trees that would support maternity roosts.	No further actions are recommended for this species.
Birds				
golden eagle *Aquila chrysaetos*	CFP, BGEPA	Resident in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees in open areas.	**Unlikely.** Individuals may occasionally fly over the Study Area, but the Study Area does not contain any trees to support nesting and is surrounded by development, reducing the likelihood this species may even forage there.	No further actions are recommended for this species.
bald eagle *Haliaeetus leucocephalus*	SE, CFP, BGEPA	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Unlikely.** The Study Area and surrounding areas do not contain large bodies of water to support foraging or trees near water to support nesting. This species may occasionally fly over the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Swainson's hawk *Buteo swainsonii*	ST	Summer resident in the region. Forages in grasslands and nests in the immediate vicinity, often in relatively isolated, trees or tree groves. Most of the California population breeds in the Central Valley. Forages on insects and rodents, also other vertebrates.	**Moderate Potential.** Swainson's hawk have been documented to nest in proximity to the Study Area and several of the Project Areas contain trees that could be suitable for nesting Swainson's hawk.	Protocol level surveys are recommended if activities would occur in the breeding season. See Section 7 of the text for further details.
northern harrier *Circus cyaneus*	SSC	Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. May also occur in alkali desert sinks.	**Unlikely.** The Study Area does not contain freshwater marshes with shrubby vegetation.	No further actions are recommended for this species.
white-tailed kite *Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**Moderate Potential.** The Study Area does contain trees or shrubs suitable for nesting.	Surveys for nesting white-tailed kite are recommended for sites with trees and shrubs if activities would occur in the breeding season. See Section 7 of the text for further details.
burrowing owl *Athene cunicularia*	SSC	Inhabits, dry annual or perennial grassland, desert and scrubland characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably California ground squirrel.	**Moderate Potential.** Some of the Well Sites contain burrows or burrow analogues that could support burrowing owl.	Preconstruction surveys are recommended or required. See Section 7 of the text for further details.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
short-eared owl *Asio flammeus*	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**Unlikely.** The Study Area and adjacent areas do not contain marshes to support nesting for this species, and because the Study Area is surrounded by development the quality of the foraging habitat is diminished.	No further actions are recommended for this species.
long-eared owl *Asio otus*	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	**Unlikely.** The Study Area and adjacent areas do not contain woodland or mature riparian habitats to support nesting for this species, and because the Study Area is surrounded by development, the quality of the foraging habitat is diminished.	No further actions are recommended for this species.
purple martin *Progne subis*	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	**Unlikely.** The Study Area and adjacent areas do not contain woodland, forest, or human-made structures to support nesting for this species. This species may occasionally fly over or forage in the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
bank swallow *Riparia riparia*	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean. Historical range in southern and central areas of California has been eliminated by loss of nesting habitat due to flood and erosion-control projects, but currently is known to breed in Siskiyou, Shasta, and Lassen Cos., and along Sacramento River from Shasta Co. south to Yolo Co.	**Unlikely.** The Study Area and adjacent areas do not contain cliffs or riparian habitats necessary to support nesting for this species. This species may occasionally forage or fly over the Study Area.	No further actions are recommended for this species.
loggerhead shrike *Lanius ludovicianus*	SSC	Found in broken woodlands, savannah, pinyon-juniper, Joshua tree and riparian woodlands, and desert oases, scrub, and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**Unlikely.** Although the Study Area contains limited potential foraging habitat for this species, it the Well Sites are limited in size and are mostly embedded in an urban setting.	No further actions are recommended for this species.
California black rail *Laterallus jamaicensis coturniculus*	ST, CFP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	**Unlikely.** The Study Area does not contain marsh habitat to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
least bell's vireo *Vireo bellii pusillus*	FE, SE	Summer resident. Breeds in riparian habitat along perennial or intermittent rivers and creeks; prefers a multi-tiered canopy with dense early successional vegetation in the understory. Willows, mulefat and other understory species are typically used for nesting.	**No Potential.** The Study Area and adjacent areas do not contain contiguous riparian habitat to support this species, and the regional documented occurrences of this species in vicinity the past 100 years are west of the Study Area in the Yolo Bypass Wildlife Refuge (eBird 2020, CDFW 2020).	No further actions are recommended for this species.
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT, SE	Summer resident, breeding in dense riparian forests and jungles, typically with early successional vegetation present. Utilizes densely foliaged deciduous trees and shrubs. Eats mostly caterpillars. Current breeding distribution within California very restricted.	**No Potential.** The Study Area does not contain dense riparian forest to support this species.	No further actions are recommended for this species.
yellow-breasted chat *Icteria virens*	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	**Unlikely.** The Study Area does not contain riparian environments to support nesting for this species. This species may occasionally fly over the Study Area, but it will not nest there.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
tricolored blackbird *Agelaius tricolor*	ST, SSC	Usually nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs. Nesting area must be large enough to support about 50 pairs.	**Unlikely.** The Study Area does not contain and is not adjacent to wetlands with dense emergent vegetation to support nesting for this species. This species may occasionally fly over the Study Area, but it will not nest there.	No further actions are recommended for this species.
grasshopper sparrow *Ammodramus savannarum*	SSC	Summer resident in the region. Breeds in open grassland habitats, generally with low- to moderate-height grasses and scattered shrubs.	**Unlikely.** The Study Area does not contain open grasslands in their natural state that would support nesting grasshopper sparrows.	No further actions are recommended for this species.
song sparrow (Modesto Population) *Melospiza melodia*	SSC	Restricted to the Sacramento and extreme northern San Joaquin Valleys from Colusa County south to Stanislaus County. Associated with woody riparian habitat and freshwater marshes.	**Unlikely.** The Study Area does not contain riparian or wetland habitat with emergent vegetation to the extent needed to support this species.	No further actions are recommended for this species.
Reptiles and Amphibians				
western spadefoot *Spea (=Scaphiopus) hammondii*	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Shallow temporary pools formed by winter rains are essential for breeding and egg-laying.	**Unlikely.** The Well Sites are nearly all located in an urban setting surrounded by roads. Furthermore, they are managed by mowing or disking.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
California red-legged frog *Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to estivation habitat.	**No Potential.** California red-legged frog is considered extirpated in the region. There are no documented occurrences of this species within 5 miles of the Study Area (CDFW 2020).	No further actions are recommended for this species.
California tiger salamander *Ambystoma californiense*	FT, ST	Populations in Santa Barbara and Sonoma Counties are currently listed as endangered, and the Central Valley populations are listed as threatened. Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Seasonal ponds and vernal pools are crucial to breeding. Adults utilize mammal burrows as estivation habitat.	**No Potential.** This species generally does not occur north of the American River. There are no documented occurrences of this species near the Study Area (CDFW 2020).	No further actions are recommended for this species.
giant garter snake *Thamnophis gigas*	FT, ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	**Unlikely.** The Study Area does not contain suitable habitat (upland and aquatic habitat without barriers between them) to support this species.	Because one of the sites is located near an extant population in the NBHCP area, some preconstruction surveys for that Project Area may be required. See Section 7 of the text for more information.
western pond turtle *Actinemys marmorata*	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**Unlikely.** The majority of the Study Area does not contain aquatic habitat to support turtles and the Well Sites are in an urban setting and do not have connectivity to potentially occupied areas.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Fishes				
longfin smelt *Spirinchus thaleichthys*	FC, ST	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Sacramento perch *Archoplites interruptus*	SSC	Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley. Prefer warm water. Aquatic vegetation is essential for young. Tolerate wide range of physio-chemical water conditions.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Sacramento splittail *Pogonichthys macrolepidotus*	SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Sacramento Delta, Suisun Bay and associated marshes. Occurs in slow-moving river sections and dead end sloughs. Requires flooded vegetation for spawning and foraging for young. Splittail are primarily freshwater fish, but are tolerant of moderate salinity and can live in water where salinity levels reach of 10-18 parts per thousand.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Chinook salmon - central valley spring-run ESU *Oncorhynchus tshawytscha*	FT, ST	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year, or remain in freshwater and migrate as yearlings.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Chinook salmon – Sacramento winter-run ESU *Oncorhynchus tshawytscha*	FE, SE	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
steelhead - central valley DPS *Oncorhynchus mykiss irideus*	FT	The Central Valley ESU includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo bays and their tributaries. Preferred spawning habitat for steelhead is in cool to cold perennial streams with high dissolved oxygen levels and fast flowing water. Abundant riffle areas for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Invertebrates				
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Moderate Potential.** *Sambucus* plants were observed during the June 2020 site visits, but only at a few sites.	Surveys to establish absence of Valley elderberry longhorn beetle are recommended and described in section 7.
vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	**Moderate Potential.** Wetlands that may have potential to support vernal pool fairy shrimp were identified at some sites.	Avoidance of potentially occupied wetlands or protocol surveys to establish absence of the species are recommended. See section 7 for more details.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
vernal pool tadpole shrimp *Lepidurus packardi*	FE	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	**No Potential.** The Study Area does not contain vernal pools or other seasonal pools with inundation periods sufficient to support this species.	No further actions are recommended for this species.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
SE	State Endangered
ST	State Threatened
SC	State Candidate
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority
BGEPA	Bald and Golden Eagle Protection Act
Rank 1A	CRPR Rank 1A: Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	CRPR Rank 1B: Plants rare, threatened or endangered in California and elsewhere
Rank 2B	CRPR Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3	CRPR Rank 3: Plants about which CNPS needs more information (a review list)
Rank 4	CRPR Rank 4: Plants of limited distribution – a watch list

Appendix D -- Photos

Photo 1. Seasonal wetland located at Well 2.

Photo 2. Ephemeral ditch located at Well 2.

Photo 3. Artificial pond located at Well 35.

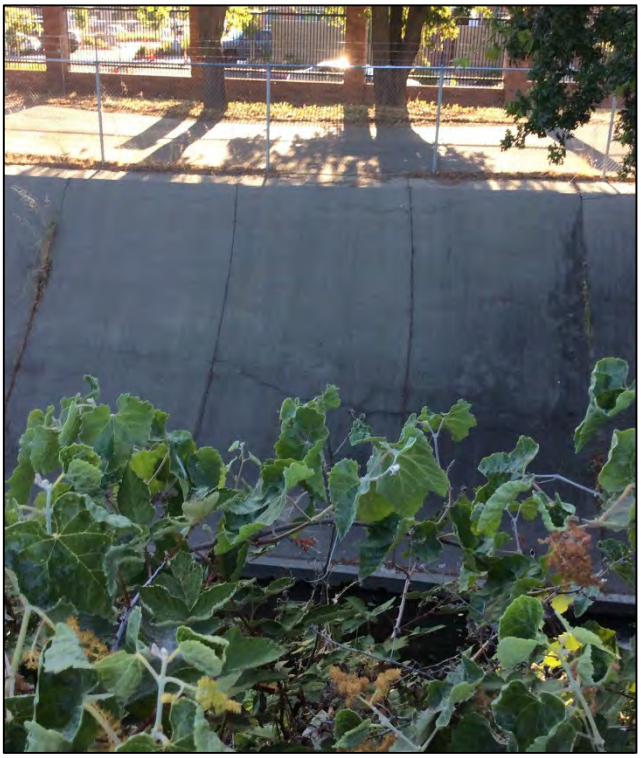


Photo 4. Drainage canal at Well 24.

Photo 5. One of the potential wetlands located at Well 37.

Photo 6. Drainage canal located at Well 39.

Photo 7. Drainage canal located at Well 15.

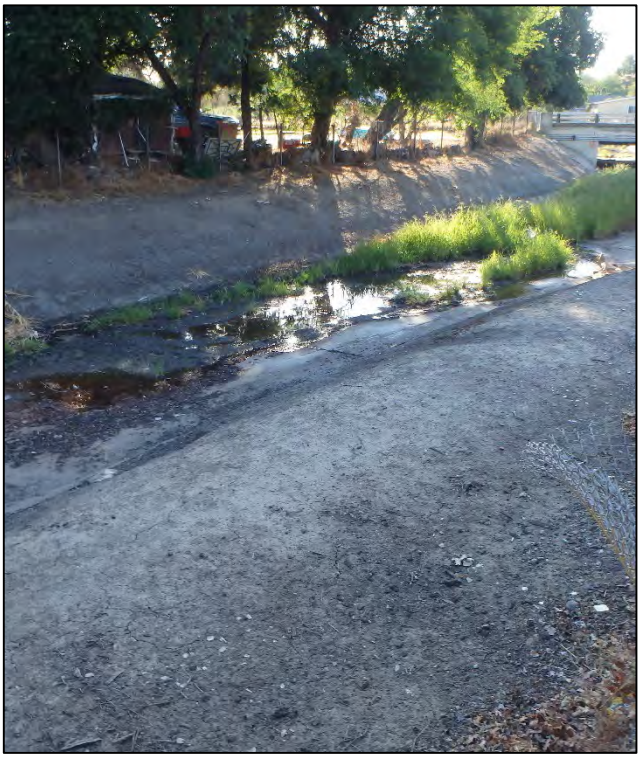


Photo 8. Drainage canal located at Well 30.

Photo 9. Wetland located in drainage canal at Well 30.

Photo 10. Potential wetland located at Well 29.

Photo 11. Example of potential bat tree. This tree is located at Well 27.

Photo 12. Example of landscape areas within the Study Area. Each of the trees are also considered a City Tree.

Photo 13. Example of non-native grassland within the Study Area.

Photo 14. Example of developed areas within the Study Area.

Photo 15. Example of non-native grassland within the Study Area.

Photo 16. Example of potential Burrowing owl habitat. This photograph is taken at Well 7.