3.9 HYDROLOGY AND WATER QUALITY

This section identifies the regulatory context and policies related to hydrology and water quality, describes the existing hydrologic conditions at the Project site, and evaluates potential hydrology and receiving water-quality impacts of the proposed New Zoo Project. Potential effects on the capacity of City of Sacramento water-supply, sewer/wastewater, and drainage/stormwater facilities are addressed in Section 3.15, "Utilities and Service Systems."

Scoping comments received regarding regulatory setting and permitting requirements in response to the notice of preparation (NOP) stated that the EIR should address potential Project impacts on Hydrology and Water Quality. These issues are addressed in the impacts analysis below. See Appendix A for all NOP comments received.

3.9.1 Regulatory Setting

FEDERAL

Clean Water Act

The US Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) is the primary federal law that governs and authorizes water quality control activities by EPA as well as the states. Various elements of the CWA address water quality. These are discussed below.

CWA Water Quality Criteria/Standards

Pursuant to federal law, EPA has published water quality regulations under Title 40 of the Code of Federal Regulations (CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the act, water quality standards consist of designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. As described in the discussion of State regulations below, the State Water Resources Control Board (State Water Board) and its nine regional water quality control boards (RWQCBs) have designated authority in California to identify beneficial uses and adopt applicable water quality objectives.

CWA Section 303(d) Impaired Waters List

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that do not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries). Section 303(d) requires that the State develop a total maximum daily load (TMDL) for each of the listed pollutants. The TMDL is the amount of the pollutant that the water body can receive and still comply with water quality objectives. The TMDL is also a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. In California, implementation of TMDLs is achieved through water quality control plans, known as Basin Plans, of the State RWQCBs. See "State" section, below.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate municipal and industrial discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source waste discharges and nonpoint source stormwater runoff. Each NPDES permit identifies limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits.

"Nonpoint source" pollution originates over a wide area rather than from a definable point. Nonpoint source pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. Two types of nonpoint source discharges are controlled by the NPDES program: discharges

caused by general construction activities and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the maximum extent practicable. The RWQCBs in California are responsible for implementing the NPDES permit system (see the "State" section, below).

National Flood Insurance Act

The Federal Emergency Management Agency (FEMA) is tasked with responding to, planning for, recovering from and mitigating against disasters. The Federal Insurance and Mitigation Administration within FEMA is responsible for administering the National Flood Insurance Program (NFIP) and administering programs that aid with mitigating future damages from natural hazards.

FEMA prepares Flood Insurance Rate Maps (FIRMs) that delineate the regulatory floodplain to assist local governments with the land use planning and floodplain management decisions needed to meet the requirements of NFIP. Floodplains are divided into flood hazard areas, which are areas designated per their potential for flooding, as delineated on FIRMs. Special Flood Hazard Areas are the areas identified as having a 1-percent chance of flooding in each year (otherwise known as the 100-year flood). In general, the NFIP mandates that development is not to proceed within the regulatory 100-year floodplain if the development is expected to increase flood elevation by 1 foot or more.

STATE

California Porter-Cologne Water Quality Control Act

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Board and each of the nine RWQCBs power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Clean Water Act. The applicable RWQCB for the Project is the Central Valley RWQCB. The State Water Board and the Central Valley RWQCB have the authority and responsibility to adopt plans and policies, regulate discharges to surface and groundwater, regulate waste disposal sites, and require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substances, sewage, or oil or petroleum products.

Under the Porter-Cologne Act, each RWQCB must formulate and adopt a water quality control plan (known as a "Basin Plan") for its region. The Basin Plan for the Central Valley Region includes a comprehensive list of waterbodies within the region and detailed language about the components of applicable Water Quality Objectives (WQOs). The Basin Plan recognizes natural water quality, existing and potential beneficial uses, and water quality problems associated with human activities throughout the Sacramento and San Joaquin River Basins. Through the Basin Plan, the Central Valley RWQCB executes its regulatory authority to enforce the implementation of TMDLs, and to ensure compliance with surface WQOs. The Basin Plan includes both narrative, and numerical WQOs designed to provide protection for all designated and potential beneficial uses in all its principal streams and tributaries. Applicable beneficial uses include municipal and domestic water supply, irrigation, non-contact and contact water recreation, groundwater recharge, fresh water replenishment, hydroelectric power generation, and preservation and enhancement of wildlife, fish, and other aquatic resources.

The Central Valley RWQCB also administers the adoption of waste discharge requirements (WDRs), manages groundwater quality, and adopts projects within its boundaries under the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit).

NPDES Construction General Permit for Stormwater Discharges Associated with Construction Activity

The State Water Board adopted the statewide NPDES General Permit in August 1999. The State requires that projects disturbing more than 1 acre of land during construction file a Notice of Intent with the RWQCB to be covered under

this permit. Construction activities subject to the General Permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non stormwater discharges to storm sewer systems and other waters. A stormwater pollution prevention plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include best management plans (BMPs) designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving off-site into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

NPDES Stormwater Permit for Discharges from Small Municipal Separate Storm Sewer Systems

The Municipal Stormwater Permitting Program regulates stormwater discharges from municipal separate storm sewer systems (MS4s). Stormwater is runoff from rain or snow melt that runs off surfaces such as rooftops, paved streets, highways or parking lots and can carry with it pollutants such as oil, pesticides, herbicides, sediment, trash, bacteria and metals. The runoff can then drain directly into a local stream, lake or bay. Often, the runoff drains into storm drains which eventually drain untreated into a local waterbody.

The City is an MS4 co-permittee with the cities of Citrus Heights, Folsom, Galt, Rancho Cordova, and Sacramento and the County of Sacramento. NPDES permit terms are 5 years. The current regionwide permit (Order No. R5-2016-0040), adopted by the Central Valley RWQCB in June 2016, allows each permittee to discharge urban runoff from MS4s in its respective municipal jurisdiction, and it requires Phase I MS4 permittees to enroll under the regionwide permit as their current individual permits expire. Regional MS4 permit activities are managed jointly by the Sacramento Stormwater Quality Partnership, which consists of the seven jurisdictions covered by the permit.

Under the permit, each permittee is also responsible for ensuring that stormwater quality management plans are developed and implemented that meet the discharge requirements of the permit. Under the 2016 permit, measures should be included in the stormwater quality management plan that demonstrate how new development would incorporate low-impact development (LID) design in projects. The new permit also includes requirements for addressing TMDLs. The City Department of Public Works is responsible for ensuring that its specific MS4 permit (Order No. R5-2016-0040-005) requirements are implemented. Compliance with the MS4 permit is regulated through Chapter 15.12 of the City of Elk Grove Municipal Code (EGMC).

California Water Code

The California Water Code is enforced by the California Department of Water Resources (DWR). The mission of DWR is "to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments." DWR is responsible for promoting California's general welfare by ensuring beneficial water use and development Statewide.

Groundwater Management

Groundwater Management is outlined in the California Water Code, Division 6, Part 2.75, Chapters 1-5, Sections 10750 through 10755.4. The Groundwater Management Act was first introduced in 1992 as AB 3030, and has since been modified by SB 1938 in 2002, AB 359 in 2011, and the Sustainable Groundwater Management Act (SB 1168, SB 1319, and AB 1739) in 2014. The intent of the Acts is to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions and to provide a methodology for developing a Groundwater Management Plan.

The Sustainable Groundwater Management Act of 2014 (SGMA) became law on January 1, 2015, and applies to all groundwater basins in the State (Water Code Section 10720.3). By enacting the SGMA, the legislature intended to provide local agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater within their jurisdiction (Water Code Section 10720.1).

Pursuant to the SGMA, any local agency that has water supply, water management or land use responsibilities within a groundwater basin may elect to be a "groundwater sustainability agency" for that basin (Water Code Section 10723). The Groundwater Sustainability Agencies that consists of the Sacramento Central Groundwater Authority (SCGA), Omochumne-Hartnell Water District (OHWD), Sloughhouse Resource Conservation District, North Delta GSAs, Reclamation District 551 (RD 551), and Sacramento County adopted the 2021 South American Subbasin

Groundwater Sustainability Plan (SASb GSP) in compliance with SGMA. The SASb GSP identifies that the long-term average annual sustainable groundwater yield of the South American Subbasin is 235,000 acre-feet per year (afy). Project and management actions that would contribute to the achievement of the sustainability goal of the SASb GSP include the following:

- existing projects that include diversification of water supplies (Freeport Regional Water Project, Vineyard Surface Water Treatment Plant, and conjunctive use improvements) and
- near-term planned projects that include the Sacramento Regional County Sanitation District Harvest Water project, OHWD Groundwater Recharge Project, Regional Conjunctive Use Program, and Sacramento Area Flood Control Agency Flood-MAR. (Northern Delta Groundwater Sustainability Agency et al. 2021: 4-1 to 4-22).

Central Valley Flood Protection Act

The Central Valley Flood Protection Act of 2008 establishes the 200-year flood event as the minimum level of protection for urban and urbanizing areas. As part of the State's FloodSAFE program, those urban and urbanizing areas protected by flood control project levees must receive protection from the 200-year flood event level by 2025. The DWR and Central Valley Flood Protection Board (CVFPB) collaborated with local governments and planning agencies to prepare the 2012 Central Valley Flood Protection Plan (CVFPP) (DWR 2012), which the CVFPB adopted on June 29, 2012. The objective of the 2012 CVFPP is to create a system-wide approach to flood management and protection improvements for the Central Valley and San Joaquin Valley. The Central Valley Flood Protection Act calls for updates to the CVFPP every 5-years. At the time of preparation of this Draft EIR, the Project site falls under the jurisdiction of the 2022 CVFPP Update.

State Plan of Flood Control

Section 9110(f) of the California Water Code defines the SPFC as follows, "'State Plan of Flood Control' means the State and federal flood control works, lands, programs, plans, policies, conditions, and mode of maintenance and operations of the Sacramento River Flood Control Project described in Section 8350, and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section 12648) of Chapter 2 of Part 6 of Division 6 for which the board or the department has provided the assurances of nonfederal cooperation to the United States, and those facilities identified in Section 8361."

The SPFC encompasses a wide network of facilities, which range from major structures such as levees, drainage pumping plants, drop structures, dams and reservoirs, and major channel improvements, to minor components such as stream gauges, pipes, and bridges.

LOCAL

Sacramento Central Groundwater Authority

SCGA manages groundwater in the Central Basin portion of the South American Subbasin. SCGA was formed in 2006 through a joint powers agreement signed by the Cities of Elk Grove, Folsom, Rancho Cordova, and Sacramento and Sacramento County. Among its many purposes, SCGA is responsible for managing the use of groundwater in the Central Basin to ensure long-term sustainable yield and for facilitating a conjunctive use program. The framework for maintaining groundwater resources in the Central Basin is the Sacramento County Water Agency (SCWA) Groundwater Management Plan, which includes specific goals, objectives, and an action plan to manage the basin. The plan also prescribes a well protection program to protect existing private domestic well and agricultural well owners from declining groundwater levels resulting from increased groundwater pumping attributable to new development in the basin (SCWA 2016).

The SGMA also authorizes a groundwater management agency in a basin compliant with the California Statewide Groundwater Elevation Monitoring program to prepare an "Alternative" to a groundwater sustainability plan. SCGA submitted an Alternative Submittal document to DWR, but the document was not approved because, among other deficiencies, DWR was unable to verify that groundwater yield thresholds established by SCWA would prevent

adverse effects on groundwater (DWR 2019). SCGA adopted the SASb Groundwater Sustainability Plan (GSP) to the DWR on December 8, 2021.

Water Forum Agreement

The Water Forum is made up of a diverse group of businesses, agricultural leaders, environmentalists, citizen groups, water managers, and local governments from Sacramento, Placer, and El Dorado Counties. These stakeholders came together in 2000 to form an agreement for water management with the goals of providing a reliable and safe water supply for the region's economic health through 2030 and preserving the fishery, wildlife, recreation, and aesthetic values of the lower American River (Sacramento Suburban Water District 2003). The Water Forum Agreement was formalized through a Memorandum of Understanding whereby all signatories agreed to carry out the actions specified for them. SCGA relied on the negotiated volume of groundwater production referred to in the Water Forum Agreement as the basis for the groundwater yield thresholds described in the Alternative Submittal discussed above.

City of Elk Grove General Plan

The *City of Elk Grove General Plan* (City of Elk Grove 2019a) contains the following policies related to hydrology and water quality:

- **Policy NR-3-1:** Ensure that the quality of water resources (e.g., groundwater, surface water) is protected to the extent possible.
- **Policy NR-3-2:** Integrate sustainable stormwater management techniques in site design to reduce stormwater and control erosion.
- **Policy NR-3-3:** Implement the City's NPDES permit through the review and approval of development project and other activities regulated by the permit.
- **Policy NR-3-5:** Continue to coordinate with public and private water users, including users of private wells, to maintain and implement a comprehensive groundwater management plan.
- **Policy NR-3-6:** Support and coordinate with the efforts of the Sacramento Central Groundwater Authority in the development, adoption and ongoing implementation of the Groundwater Sustainability Plan for the South American Subbasin.
- **Policy ER-2-2:** Require that all new projects not result in new or increased flooding impacts on adjoining parcels or on upstream and downstream areas.
- **Policy ER-2-10:** Work with regional, county, and State agencies to develop mechanisms to finance the design and construction of flood management and drainage facilities to achieve an urban level of flood protection in affected areas.
- **Policy ER-2-17:** Require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing comprehensive drainage plans.
- **Policy ER-2-18:** Drainage facilities should be properly maintained to ensure their proper operation during storms.
- **Policy ER-6-8:** Continue to participate in the Sacramento Stormwater Quality Partnership to educate and inform the public about urban runoff pollution, work with industries and businesses to encourage pollution prevention, require construction activities to reduce erosion and pollution, and require developing projects to include pollution controls that will continue to operate after construction is complete.
- **Policy LU-5-12:** Integrate sustainable stormwater management techniques in site design to reduce stormwater runoff and control erosion.

City of Elk Grove Storm Drainage Master Plan

The City's comprehensive Storm Drain Master Plan identifies drainage concepts for upgrading the existing storm drainage and flood control collection system. It identifies and analyzes existing drainage deficiencies throughout the City, provides a range of drainage concepts for the construction of future facilities required to serve the City at

buildout of the existing General Plan, and establishes criteria for selecting and prioritizing projects. The Storm Drain Master Plan may also be used for the development of a capital drainage financing program (City of Elk Grove 2011).

City of Elk Grove Municipal Code

Municipal Code Chapter 15.12: Stormwater Management and Discharge Control

EGMC Chapter 15.12 provides authority to the City for inspection and enforcement related to control of illegal and industrial discharges to the City storm drainage system and local receiving waters. It also addresses the requirement for BMPs and regulations to reduce pollutants in the City's stormwater.

Municipal Code Chapter 16.44: Land Grading and Erosion Control

EGMC Chapter 16.44 establishes administrative procedures, standards for review and implementation, and enforcement procedures for controlling erosion, sedimentation, other pollutant runoff, and the disruption of existing drainage and related environmental damage to ensure compliance with the City's NPDES permit. The chapter requires, before grading activities begin, that a detailed set of plans be developed that include measures to minimize erosion, sediment, and dust created by development activities.

3.9.2 Environmental Setting

HYDROLOGY AND DRAINAGE

Regional Hydrology

The Project site is located in the southern end of the Sacramento Valley, approximately 30 miles northeast of the confluence of the San Joaquin and Sacramento Rivers. The Sacramento and San Joaquin Valleys make up the Great Valley geomorphic province of California, bounded by the Sierra Nevada to the east and the Coast Ranges to the west. The two rivers join in the Sacramento–San Joaquin Delta (the Delta), a massive complex of wetlands, marshes, and channels, and enter the Pacific Ocean at the San Francisco Bay.

The Sacramento River is the largest river and watershed system in California. Its watershed covers about 27,000 square miles and carries about 31 percent of the State's total surface water runoff. Its watershed covers 27,000 square miles and carries 31 percent of the State's total surface water runoff. Primary tributaries include the Pit, Feather, and American Rivers (SRWP 2010). The mouth of the Sacramento River is at Suisun Bay near Antioch, where it combines with the San Joaquin River. Following winter rains and Sierra snowmelt, the Sacramento River and its tributaries would historically rise and inundate their broad floodplains. This dynamic system deposited rich alluvial soil, changing the river's course, and creating oxbow lakes and backwater, clearing debris and streambeds, and supporting miles of wetlands and riparian forest (USFWS 2007).

Development began in the lower portions of the Sacramento River watershed in the mid-1800s to take advantage of the proximity of two large rivers and fertile soils. Reclamation districts began to form in the early 1900s to construct canal and levee systems as a means for controlling or preventing natural flood events in the low-lying areas adjacent to the river (City of Elk Grove 2018). However, the river channel and levees could not contain the floodwaters from larger storm events. In 1917, after the massive floods of 1907 and 1909, the State of California developed the Sacramento River Flood Control Project. This project is a system of weirs (lowered and armored sections of levees design to be overtopped by high flows) that release floodwaters into a bypass system when flows exceed the downstream capacity of the river channel.

Local Hydrology

Aquatic resources on the Project site consist of an agricultural irrigation canal and smaller irrigation ditches used to water the onsite pastures. The Shed C channel runs adjacent to the northern border of the Project site. The closest local significant waterway is the Cosumnes River and adjacent flood plain over 2 miles east of the Project site, on the

eastern border of the Elk Grove City limits. The river is part of the larger San Joaquin River watershed. The Cosumnes River is one of the last free-flowing, undammed rivers on the western slope of the Sierra Nevada.

Stormwater Drainage

Urban runoff is created by stormwater draining from impervious surfaces in developed areas. As stormwater flows from individual sites, it is traditionally collected in curb and gutter drainage systems and directed to larger storm drains that eventually drain to surface waters. Urban runoff within the City is conveyed through a storm drainage and flood control collection system that includes nearly 400 miles of underground piping and 60 miles of natural and constructed channels (City of Elk Grove 2018). The City owns and operates these facilities and channels, including pump stations, levees, detention basins, and other flood control features.

The Project site is located within the Shed C drainage area (Kimley Horn 2023). Storm water from the Project site flows into the Shed C channel, which extends from near the Project site approximately 6 miles west to the Beach Stone Lakes National Wildlife Refuge and, eventually, to the Sacramento River delta. In 2014, a Storm Water Drainage Master Plan was prepared and approved for the Project site and surrounding development area (the Southeast Policy Area Drainage Master Plan) (City of Elk Grove 2011).

Flood Conditions

Flooding affects portions of Elk Grove. The 100-year floodplain zone estimates inundation areas based on a flood that has a 1 percent chance of occurring in any given year. 100-year flood zones within the City limits of Elk Grove include areas along Laguna Creek in the northwest and north-central portion of the City, and along the Cosumnes River to the southeast, primarily outside of City limits, but still within the City's General Plan Area. Flood risk is intensified in the lower stream reaches by high tides occurring in the Delta at the same time as strong offshore winds during heavy rainfall. The Project site is classified as Flood Zone X and is considered an area of minimal flood hazard (City of Elk Grove 2018). The closest flood zone to the Project site is located southeast and surrounds the Consume River in unincorporated Sacramento County. The Project site lies outside of any dam or levee inundation zones (City of Elk Grove 2018).

Groundwater Hydrology

The Central Valley of California contains the largest basin-fill aquifer system in the State. From north to south, the aquifer system is divided into the Sacramento Valley, Sacramento–San Joaquin Delta, and San Joaquin Valley subregions. The City of Elk Grove is situated within the Sacramento Valley Groundwater Basin, South American Subbasin. Within the larger South American Subbasin, there are three groundwater basins—North, Central, and South—in Sacramento County. The Project site is located within the Central Basin, which includes the City of Elk Grove and areas of Sacramento County and the City of Sacramento (City of Elk Grove 2018). Groundwater in the Central Basin generally occurs in a shallow aquifer zone (Modesto Formation) or in an underlying deeper aquifer zone (Mehrten Formation). Groundwater in the shallow aquifer is generally located between 20 and 100 feet below the ground surface (bgs) depending on where and when the measurement is taken and extends to approximately 200–300 feet bgs (SCWA 2006). Water quality in this zone is considered to be good with the exception of high arsenic detections in a few locations. The deep aquifer is separated from the shallow aquifer by a discontinuous clay layer that partially isolates the two water sources. There is some potential for movement of groundwater between the two aquifers, usually the result of heavy groundwater pumping. The base of the potable water portion of the deep aquifer averages approximately 1,400 feet bgs. Water in this aquifer typically has higher concentrations of total dissolved solids, iron, and manganese (SCWA 2006).

Older municipal wells and all domestic wells have been constructed in the shallow aquifer zone to avoid treatment. However, the policies and practices of SCWA in the Central Basin have led to the construction of larger municipal wells that target the Mehrten Formation where higher production rates can be achieved and less impact on private domestic wells would occur. This policy has in turn led to California Department of Health Services (now the California Department of Health Care Services) requiring treatment of all municipal wells to meet primary and secondary drinking water quality standards (SCWA 2006).

Intensive use of groundwater over the past 60 years has resulted in a general lowering of groundwater elevations centered near Elk Grove. This localized lowering of the groundwater table is called a cone of depression. The Elk Grove cone of depression was first identified in the *Central Sacramento County Groundwater Management Plan* (SCWA 2006). The 2018 SGMA annual report found a substantial reduction in the size and extent of the cone of depression, which is attributed to active management of the basin and reductions in groundwater extraction (SGMA 2019).

Groundwater Management

The SCWA manages water supplies in Sacramento County, and boundaries of the SCWA are identical to the county boundaries. Water supplies consist of surface water, groundwater, recycled water, and purchased water. As authorized by the Sacramento County Water Agency Act in 1952, the agency may contract with the federal government and the State of California with respect to the purchase, sale, and acquisition of water. The service area is divided into eight systems, the largest of which are the Mather Sunrise and Laguna Vineyard systems. The City, within City limits, is in the Laguna Vineyard system (SCWA 2006).

SCWA has a remediated groundwater supply of 8,900 afy in accordance with the terms and conditions in the agreement entitled "Agreement between Sacramento County, SCWA, and Aerojet-General Corporation with Respect to Transfer of GET Water" dated May 18, 2010. This remediated groundwater supply is diverted by SCWA from the Sacramento River at Freeport along with SCWA's surface water supplies (SCWA 2010).

WATER QUALITY

Surface Water Quality

Section 303(d) of the federal Clean Water Act establishes the total maximum daily load (TMDL) process, which requires states to identify waters whose water quality is "impaired" (affected by the presence of pollutants or contaminants), and to establish a TMDL or the maximum quantity of a particular contaminant that a water body can assimilate without experiencing adverse effects on the waterbody's identified beneficial uses. The 303(d) list, approved by the EPA, identifies these impaired water bodies. According to the most recent 303(d) list, Elder, Elk Grove, and Morrison creeks are designated as impaired water bodies for various pesticides and sediment toxicity, resulting from urban runoff, agriculture, and unknown sources. The segment of the Sacramento River west of the City is listed for diazinon and mercury. The Delta waterways (northern portions), which are the downstream receiving waters for the Sacramento River, are designated as impaired water bodies. The upper Cosumnes River (above Michigan Bar) is listed for invasive species from an unknown source, and Deer Creek in Sacramento County is listed for iron from an unknown source (State Water Board 2010).

The Project site is in an urban watershed isolated by levees that drain to South Stone Lake, the Sacramento River, and the Delta. Water quality in the portions of the Sacramento River and the northern Delta waterways has been affected by historical gold mining activities along tributaries, agricultural runoff, and discharges of industrial and urban waste. In recent decades, treatment of wastewater and management of urban stormwater have improved greatly (SRWP 2010). Industrial dischargers and municipalities now provide at least secondary treatment of wastewater, and many cities have implemented urban stormwater programs to reduce the effects of urban runoff on adjacent waterways (SRWP 2010).

In 1990, the Central Valley RWQCB identified the Delta as impaired by mercury because levels of mercury in fish posed a risk of human and wildlife consumers. Mercury in the Delta comes from historic mining activities; naturally occurring mercury in soils; and atmospheric deposition from the burning of coal, natural gas, and petroleum (EPA 2015). Methylmercury is the most hazardous form of mercury in the environment and can cause neurological symptoms and developmental concerns for children exposed in utero. It also can cause reduced reproductive success in wildlife. Because mercury is absorbed from food sources and accumulates in the tissues of organisms as they age (referred to as bioaccumulation), mercury concentrations increase in higher levels of the food chain.

Around the time when it identified the issue with mercury, the Central Valley RWQCB also found that north Delta waterways were contaminated with high levels of organophosphate agricultural pesticides (particularly diazinon and chlorpyrifos). To address this issue, limitations were placed on the concentration of these pesticides allowed in

discharges. Over the past 25 years, this has resulted in changes in agricultural practices so that levels of organophosphate pesticides meet WQOs in most samples (Central Valley RWQCB 2014).

Delta waters contain high levels of organic carbon and nutrients. The nutrients stimulate algal growth, which causes taste and odor concerns for use of the water in domestic supply. The nutrients also cause excessive growth of water weeds (such as water hyacinth) that interfere with recreational use of Delta waters for boating and swimming. The growth of these weeds can also plug screens on irrigation canals and drip irrigation systems when Delta waters are used for agricultural purposes (Lee and Jones-Lee 2004).

Water quality in North and South Stone Lakes is affected by drainage that originates in urban and agricultural areas and empties into the lakes and surrounding wetlands (USFWS 2007). Baseline water quality data collected between 1997 and 2000 found high levels of selenium in both North and South Stone Lakes. Temperature, pH, dissolved oxygen, and conductivity were within normal levels; however, approximately half of the samples had elevated levels of copper and one-quarter of the samples had high levels of lead. Nearly all sites had concentrations of pesticide diazinon above recommended chronic criteria (USFWS 2007).

Groundwater Quality

Groundwater quality can be affected by many things, but the chief controls on the characteristics of groundwater quality are the source and chemical composition of recharge water, properties of the host sediment, and history of discharge or leakage of pollutants. The groundwater quality in the South American Subbasin is generally good, although iron and manganese are common and there are some occurrences of arsenic and nitrate. Groundwater in the upper aquifer system is of higher quality than that found in the lower aquifer system, although there are some occurrences of arsenic (which is known to occur naturally in aquifer sediments) and nitrate. Water from the upper aquifer generally does not require treatment other than disinfection for public drinking water systems unless high arsenic or nitrate values are encountered (SCWA 2016). The lower aquifer system contains higher concentrations of iron, manganese, and total dissolved solids (TDS), and wells that pump from the lower aquifer often require treatment for iron and manganese. Most of the SCWA's Zone 40 wells have iron and manganese treatment facilities. Principal groundwater contaminant plumes within the South American Subbasin emanate from source areas including Mather Field, Aerojet, Boeing, the former Army Depot, and various landfills. The presence of these contaminant plumes has impacted some existing municipal wells. Significant remediation efforts/programs by federal, State, and local government agencies are in progress to clean up the contaminated groundwater and confine the contaminant plumes from further spreading. There are ongoing discussions and negotiations between purveyors and parties responsible for the cleanup to keep the remediated groundwater in the South American Subbasin and put it to beneficial use (SCWA 2016).

3.9.3 Impacts and Mitigation Measures

METHODOLOGY

Evaluation of potential hydrologic and water quality impacts is based on a review of documents and studies that address water resources in the vicinity of the Project site. Information obtained from these sources was reviewed and summarized to describe existing conditions and to identify potential environmental effects, based on the thresholds of significance presented below. The conclusions presented in this analysis assume that the Project would comply with relevant federal, State, and local laws, ordinances, and regulations.

THRESHOLDS OF SIGNIFICANCE

An impact on hydrology or water quality would be significant if implementation of the Project would:

- violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;

- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin;
- 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 that would:
  - result in substantial erosion or siltation on- or off-site;
  - result in flooding on-site or off-site as a result of substantially increasing the rate or amount of surface runoff;
  - create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
  - impede or redirect flood flows;
- in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation; or
- conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

ISSUES NOT DISCUSSED FURTHER

Inundation

In the event of dam failure, Folsom Dam and Sly Park Dam have the potential to cause flooding in parts of the City and unincorporated Sacramento County. The Project site and off-site improvements lie outside, and are not adjacent to, the 100-, 200-, and 500-year floodplain. The US Army Corps of Engineers is completing improvements to the Folsom Dam spillway on the American River to help reduce downstream flood risk. Flooding from Sly Park Dam would generally follow the Cosumnes River and would affect only a small area located southeast of the Project site in unincorporated Sacramento County. The potential for flooding from failure of either Folsom Dam or Sly Park Dam would not be exacerbated by the Project (City of Elk Grove 2018: 5.9-27). Therefore, this issue as it relates to flooding related to dam failure is not discussed further.

Seiche, Tsunami, and Mudflow

The Project site is not located in a seiche, tsunami, or mudflow zone. Therefore, this issue is not discussed further.

Localized Flooding Risk Related to Changes in Site Drainage

The Project site is not located in or near an area of flood risk. Therefore, this issue is not discussed further.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 3.9-1: Violate Any Water Quality Standards or Waste Discharge Requirements or Substantially Degrade Surface Water or Groundwater Quality during Construction Activities

Project site construction activities and off-site improvements would involve ground-disturbing and excavation activities that would expose soils to wind and water erosion and potentially transport pollutants to surface water bodies, particularly during storm events. In addition, accidental spills of construction-related fuels, oils, hydraulic fluid, and other hazardous substances could contaminate stormwater flows, resulting in the potential degradation of surface water quality downstream of the disturbance area. The potential for erosion and transport of sediment and pollutants would be addressed through compliance with EGMC Chapter 16.44, which requires all projects to implement erosion control measures to minimize erosion, sediment, dust, and other pollutant runoff created by improvement activities. In addition, any project that disturbs more than 1 acre of soil would be required to obtain coverage under the Construction General NPDES permit, including completion of a SWPPP. With compliance with these existing regulations, impacts to surface and groundwater quality would be **less than significant**.

Development of the Project site would require multiple phases of construction activities that involve vegetation removal, grading, excavation, temporary stockpiling of soils, infrastructure installation, and building construction. Off-site improvements for the Project that include improvements to roadways, sewer infrastructure, electrical and telecommunication infrastructure, and storm drainage would involve similar construction activities. Construction could expose soils to wind and water erosion and potentially allow transport of pollutants to surface water bodies, particularly during storm events. Furthermore, accidental spills of construction-related fuels, oils, hydraulic fluid, and other hazardous substances could contaminate stormwater flows, resulting in the potential degradation of surface water quality downstream of the disturbance area. Construction activities have the potential to adversely affect the nearby surface water quality of the Shed C Channel. As discussed below, the groundwater level on the Project site is below the proposed depth of excavation, and construction activities would not affect groundwater.

Ground Disturbance

During construction, water quality would be protected through compliance with the discrete permits and stormwater management requirements consistent with all federal, State, and local laws applicable at the time. Improvement plans provided to the City before authorization of each construction phase would be required to conform to provisions of EGMC Chapter 16.44 (Land Grading and Erosion Control) and Chapter 15.12 (Drainage Control). In addition, because development phases of the Project would disturb more than 1 acre of soil, each construction phase would be subject to the Statewide Construction General NPDES Permit from the Central Valley RWQCB.

Compliance with these requirements would require preparation of a SWPPP prior to the start of Project construction. The Project SWPPP is not feasible to prepare at this time because more detailed plans for the Project would be needed to inform the SWPPP. A SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater discharges. The SWPPP would be prepared by a qualified SWPPP practitioner and/or a qualified SWPPP developer and would identify water quality controls consistent with the Central Valley RWQCB requirements and would ensure that runoff quality meets WQOs. The SWPPP would describe the site controls, erosion and sediment controls, means of waste disposal, implementation of approved local plans, control of postconstruction sediment and erosion control measures, and management controls unrelated to stormwater. The BMPs identified in the SWPPP would be implemented during all site development activities. The SWPPP would have the following required elements:

- Temporary BMPs would be identified to prevent the transport of earthen materials and other construction waste materials from disturbed land areas, stockpiles, and staging areas during periods of precipitation or runoff. BMPs could include, but not limited to, using filter fences, fiber rolls, erosion control blankets, mulch (such as wood chips), temporary drainage swales, settling basins, and other erosion-control methods.
- Temporary BMPs would be identified to prevent the tracking of earthen materials and other waste materials from the Project site to off-site locations. BMPs could include, but not limited to, using stabilized points of entry/exit for construction vehicles/equipment and designated vehicle/equipment rinse stations, and sweeping.
- Temporary BMPs would be identified to prevent wind erosion of earthen materials and other waste materials from the Project site. BMPs could include, but not limited to, routine application of water to disturbed land areas and covering of stockpiles with plastic or fabric sheeting.
- A spill prevention and containment plan would be prepared and implemented. Project contractors would be responsible for storing on-site materials and implementing temporary BMPs capable of capturing and containing pollutants from fueling operations, fuel storage areas, and other areas used for the storage of hydrocarbon-based materials. This would include, but not limited to, maintaining materials on-site (such as oil-absorbent booms and sheets) for the cleanup of accidental spills, using drip pans beneath construction equipment, training site workers in spill response measures, immediately cleaning up spilled materials in accordance with directives from the Central Valley RWQCB, and properly disposing of waste materials at an approved off-site location that is licensed to receive such wastes.

- Temporary BMPs would be identified to capture and contain pollutants generated by concrete construction, including, but not limited to, using lined containment for rinse water to collect runoff from the washing of concrete delivery trucks and equipment.
- Protective fencing would be used to prevent damage to trees and other vegetation that would remain after construction, including, but not limited to, tree protection fencing and individual tree protection, such as wood slats strapped along the circumference of tree trunks.
- Temporary BMPs would be identified to contain and remove drilling spoils generated by construction of bridge foundations and abutments.
- Daily inspection and maintenance of temporary BMPs would be required. The prime contractor would be required to maintain a daily log of temporary construction BMP inspections and keep the log on-site during Project construction for review by the Central Valley RWQCB.
- Tree removal activities, including the dropping of trees, would be confined to the construction limit boundaries.
- Construction boundary fencing would be required to limit disturbance and prevent access to areas not under active construction.
- Postconstruction BMPs and the BMP maintenance schedule would be identified. Postconstruction BMPs must address water quality, channel protection, overbank flood protection, and extreme flood protection.
- Disturbed areas would be revegetated with approved native seed mixes.

The SWPPP described above would be submitted to the City and the Central Valley RWQCB in conjunction with submission of the improvement and grading plans and NPDES permit coverage. City staff would review the SWPPP against the requirements of the EGMC. During construction, City staff would conduct regular inspections of the site to verify that effective stormwater BMPs are implemented and maintained.

Dewatering

Groundwater levels on the Project site range from approximately 50 to 60 feet (Geocon Consultants 2023) The Project would require excavation approximately 18 feet below surface elevation for proposed utility improvements. Dewatering (removal of groundwater from an excavation) would not be required for construction, because the depth of excavation would not reach the depth of groundwater on the Project site. Construction activities would not adversely affect groundwater below proposed construction.

Summary

Construction activities for Project implementation would result in ground disturbance but would not require dewatering for proposed excavation. With proper implementation, the water quality protections built into NPDES and City permitting would reduce the potential for construction activities to adversely affect water quality. Therefore, impacts to surface and groundwater quality would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 3.9-2: Violate Any Water Quality Standards or Waste Discharge Requirements or Substantially Degrade Surface Water or Groundwater Quality from Polluted Stormwater Runoff

Development can increase the rate of runoff and eliminate storage and infiltration that would naturally occur along drainage paths. Runoff from developed areas can carry pollutants and sediment, which can be potentially harmful to downstream receiving waters. Implementation of the Project would increase the total amount of impervious surfaces in the Project site through the construction of walkways, buildings, roadways, and parking lots. However, the Project would implement LID measures, including directing stormwater into a bioretention basin west of the Project site, to prevent the contamination of stormwater and allow the infiltration of most of the stormwater on-site. All pollution control measures would be designed in accordance with the Sacramento Region Stormwater Quality Design Manual and enforced through the City permitting process. Therefore, impacts from polluted stormwater runoff would be **less than significant**.

The amount of stormwater runoff generated from an area is affected by development through conversion of vegetated or other pervious surfaces to impervious surfaces and by the development of drainage systems that connect these impervious surfaces to streams or other water bodies. In this way, development can increase the rate of runoff and eliminate storage and infiltration that would naturally occur along drainage paths. As water runs off the land surface, it collects and carries materials and sediment, which can be potentially harmful to downstream receiving waters. The Project would include water features for animal exhibits. These exhibits would be designed to ensure that animal waste from these features would not affect groundwater quality. Although the runoff from rooftops and similar imperious surfaces would be relatively free of contaminants, the runoff generated by the new roads, walkways, and parking lots on the Project site would contain sediment, crushed road abrasives, nutrients, organic compounds, trash and debris, oil and grease, fluids from accidents and spills, landscape care products, and metals. Runoff from animal waste as part of adding exhibits to the site would also contain contaminants. These contaminants could affect the quality of surface waters if stormwater runoff is not captured and allowed to infiltrate the soil. In addition, runoff from impervious surfaces can become concentrated, causing erosion and increased sediment transport.

In compliance with the City's MS4 permit and EGMC Chapter 15.12, the City requires projects within the permit boundary to implement LID practices and BMPs to control stormwater runoff and protect water quality. LID uses site design and stormwater management to maintain the site's predevelopment runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that filter, store, detain, and allow the infiltration and evaporation of runoff close to the source of rainfall. LID practices and standards are described in the 2018 Sacramento Region Stormwater Quality Design Manual.

Project features would be designed to capture stormwater runoff and allow the infiltration of water through the site. Stormwater design features and stormwater flow for the Project were analyzed as part of the Hydrology Study and Stormwater Quality Management Plan prepared for the Project (Kimley Horn 2023). The Stormwater Quality Management Plan identifies several potential methods for processing stormwater runoff for the New Zoo. Proposed methods would include bioretention basins, compost-amended soil, landscaping, storm drain markings and signs, a vegetated swale, and proprietary devices. Project loading areas would be designed to minimize the chance of surface spills and leaks and keep any spilled or leaked materials out of the storm drain system. Project waste management areas would be designed to prevent pollutants from waste and recycling from entering the storm drain system. Proposed stormwater control methods included in the Stormwater Quality Management Plan are designed to positively affect local and regional water quality while also allowing water to percolate and recharge local aquifers.

In 2014, a Storm Water Drainage Master Plan was prepared and approved for the Project site and surrounding development area (the Southeast Policy Area Drainage Master Plan). This plan calls for improvements to the Shed C channel and the construction of a detention basin to serve the Project site and surrounding development. As of 2023, the channel improvements were being completed by development north of the Project site. The City is preparing updates to the Southeast Policy Area Storm Water Drainage Master Plan. to reflect the detention basin site proposed by the Project. The updated Master Plan is required prior to approval of the Project grading permit. Refinements to the Master Plan would relocate the detention basin planned west of the site approximately 400 feet west of the original planned location to the west side of B Drive. The relocated stormwater detention basin being completed as

part of updates to the Storm Water Drainage Master Plan and would ultimately serve the Project and be operational prior to completion of the Project. Stormwater from the Project site would be directed to the detention basins through drainage pipes within the Project site and adjacent roadways. The basin would serve as both a detention basin and hydromodification facility and flows would exit the basin into the Shed C Channel. As discussed in Section 3.3, "Biological Resources," the Shed C permit would be updated as an amendment to the Southeast Policy Area for a revised basin location to serve the Project.

The LID measures and water flow to a detention basin west of the site would prevent the contamination of stormwater and allow the infiltration of most of the stormwater from the site. All pollution control measures would be designed in accordance with the Sacramento Region Stormwater Quality Design Manual and enforced through the City permitting process. Therefore, impacts to surface and groundwater quality would be **less than significant.**

Mitigation Measures

No mitigation is required.

Impact 3.9-3: Substantially Decrease Groundwater Supplies or Interfere Substantially with Groundwater Recharge Such That the Project May Impede Sustainable Groundwater Management or Conflict with Implementation of a Groundwater Management Plan

Implementation of the Project would slightly increase the total extent of impervious area at the site and could reduce recharge of shallow groundwater systems, but this reduction would be mitigated by following landscaping and drainage requirements. Although implementing the Project would increase water demand relative to existing conditions, this change represents a small percentage of the service volume for the Laguna Vineyard service area and would not substantially decrease groundwater supplies or impede sustainable groundwater management. The Project would not conflict with or obstruct implementation of a groundwater management plan and this impact would be **less than significant**.

Impervious surfaces can intercept rainwater and inhibit infiltration that would recharge local groundwater systems. Over time, this can lead to declines in aquifer levels. This effect is especially pronounced in urban areas, where stormwater runoff from large and continuous impervious areas is collected and routed away from the site through the storm drain system. The total amount of impervious surfaces would increase as a result of Project implementation through the construction of buildings, walkways, parking, and roadway modifications, and this increase could lead to a reduced amount of water infiltrating the soil and recharging the local groundwater basin. Although implementing the Project would result in an increased area of impervious surfaces on the site, landscaping and drainage requirements included as part of the Project would ensure that stormwater runoff is allowed to infiltrate the soil and recharge the aquifer. As addressed in the discussion of Impact 3.9-2, above, the Project includes implementation of LID measures, and water would flow to the detention basin west of the site. These features would prevent the contamination of stormwater and allow infiltration of most of the stormwater from the site.

Groundwater supply can also be affected by water demand if the water supplier relies on groundwater sources. As described in Section 3.9.2, "Environmental Setting," the Project site is served by SCGA through the Laguna Vineyard water system. SCWA, as a member of the SCGA, participates in the implementation of a Groundwater Management Plan that was developed to maintain a safe and sustainable groundwater resource in the Central Basin. Subbasin operations from 2005 through 2018 have not exceeded yield limits established in the Water Forum Agreement (SCWA 2019). Although SCGA must conduct further study to confirm whether the Water Forum Agreement yield limit is sufficient to protect groundwater resources from overdraft (DWR 2019), the limit and the work of Water Forum members over the past two decades have prevented significant overdraft of the groundwater basin. SCWA has adopted policies consistent with the terms of the Water Forum Agreement to maintain long-term water supply (SCWA 2023). The policies include specific action items to develop additional surface water quality supply and treatment facilities to provide water during wet years, development of groundwater facilities to provide groundwater during dry years, banking of groundwater during wet years, development of water reclamation facilities to meet non-potable demands, and development of a financial plan to implement these action items.

Water for the Project would be provided by SCWA's conjunctive use program, which is a coordinated approach to manage surface water and groundwater supplies (SCWA 2023). The conjunctive use program for SCWA includes the use of groundwater, surface water, remediated water, and recycled water supplies.

The SASb GSP identifies the long-term average annual sustainable yield of groundwater to be 235,000 AFY, currently, the Project site is undeveloped; therefore, the Project would increase the total water demand by 240 AFY, including system losses (SCWA 2023) While the Project may increase groundwater use beyond what was evaluated in the General Plan EIR, However, as analyzed in the WSA, it is unlikely that the water demand would exceed the long-term average annual sustainable yield when factoring total water demand (3,505 AFY) and SCWA's anticipated groundwater use of 56,000 AFY in 2035, 2040, and 2045 under dry year conditions (SWCA 2023). In addition, water service providers for the Project, Laguna Vinyard, would participate and/or implement projects and management actions that have been identified in the GSP to the achievement of groundwater sustainability.

The South American Subbasin is considered a high-priority basin, however, it is not critically over drafted or adjudicated (SCWA 2019). In addition, according to the Water Supply Assessment prepared for the Project, SCWA has a water supply sufficient to serve the Project without pumping additional groundwater (SCWA 2023). See Section 3.14, "Utilities and Service Systems," for additional discussion of Project water supply and demand.

As described above, implementation of the Project would result in an increase in impervious surface area at the site. However, Project design features would allow water to infiltrate the soil and recharge the groundwater basin. Although implementing the Project would increase water demand at the site relative to existing conditions, there is sufficient water available for the Project without relying on groundwater. Implementing the Project would not substantially decrease groundwater supplies or result in conflicts with the SASb GSP or groundwater management plan. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

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