5.9 HYDROLOGY, DRAINAGE, AND WATER QUALITY

This section analyzes potential project impacts on existing drainage patterns, surface hydrology, and flood control facilities and water quality conditions in the project area. This analysis is based in upon the *Preliminary LID Report* prepared specifically for The Residences at Duarte Station by KHR Associates (2019), included as Appendix H.

Impacts on groundwater supply and other water-supply related issues are discussed in EIR Chapter 5.14 (Water).

5.9.1 REGULATORY SETTING

FEDERAL

Federal Clean Water Act

The Clean Water Act (CWA) Section 404 requires that the discharge of pollutants to "Waters of the U.S." from any point source be effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. Under the NPDES permit program, the EPA established regulations for discharging storm water by municipal and industrial facilities and construction activities.

The NPDES permit is broken up into two Phases: I and II. Phase I requires medium and large cities, or certain counties with populations of 100,000 or more, to obtain NPDES permit coverage for their storm water discharges. Phase II requires regulated small Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their storm water discharges. Polluted storm water run-off is commonly transported through MS4s. This run-off is often untreated and discharged into local water bodies.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) was created by Congress in 1968. It provides a means for property owners to financially protect themselves from flood damage. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the program. Participating communities agree to adopt and enforce ordinances that meet or exceed Federal Emergency Management Agency (FEMA) requirements to reduce the risk of flooding. The City of Duarte is a participating community and must adhere to the NFIP.

STATE

California Porter-Cologne Act

The CWA places the primary responsibility for the control of surface water pollution and for planning the development and use of water resources with the states, although it does establish certain guidelines for the states to follow in developing their programs and allows the EPA to withdraw control from states with inadequate implementation mechanisms.

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 Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its state water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

State Water Resources Control Board

The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while the RWQCBs conduct planning, permitting, and enforcement activities. For development projects, the NPDES permit is divided into two parts: construction and post-construction. The construction permitting is administered by the SWRCB, while the post-construction permitting is administered by the RWQCB.

Development projects typically result in the disturbance of soil that requires compliance with the NPDES General Permit, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activities (Order No. 2009-0009-DWQ, NPDES Number CAS000002). This Statewide General Construction permit regulates discharges from construction sites that disturb one or more acres of soil. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre of total land area must comply with the provisions of this NPDES Permit and develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). The SWPPP is required to contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP is required to list Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Section A of the Construction General Permit describes the elements that must be contained in a SWPPP. A project applicant must submit a Notice of Intent (NOI) to the SWRCB, to be covered by the NPDES General Permit, and prepare the SWPPP before beginning construction. Implementation of the plan starts with the commencement of construction and continues through the completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination (NOT) to the SWRCB to indicate that construction is completed.

REGIONAL/LOCAL

Los Angeles Regional Water Quality Control Board

The SWRCB oversees the nine RWQCBs in California. The City of Duarte is within the jurisdiction of the Los Angeles RWQCB (LARWQCB).

The Municipal Storm Water Permitting Program regulates storm water discharges from municipal separate storm sewer (drain) systems (MS4s). Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in *Clean Water Act* Section 402(p). The management programs specify what BMPs will be used to address certain program areas. The program areas include public education and outreach, illicit discharge detection and elimination, construction and post-construction, and good housekeeping for municipal operations.

To address the requirements of the *Clean Water Act*, the LARWQCB issued a NPDES Permit (*Order No. R4-2012-0175, NPDES Permit No. CAS004001*[1] within the coastal watersheds of Los Angeles County. The new requirements of the Municipal NPDES permit require that proposed projects include a plan (i.e., Standard Urban Storm Water Mitigation Plan [SUSMP], or functional equivalent document) to address potential water quality impacts on-site using Low Impact Development (LID), and that its potential impact on downstream waterbodies (i.e., hydromodification) is evaluated. Since the NPDES permit was adopted November 8, 2012, the County of Los Angeles has not yet updated guidance to address the new permit requirements. The plan (SUSMP or functional equivalent document) created for the proposed project would be required to comply with the future guidance that is currently in development.

The MS4 Permit Order requires development and implementation of a Planning and Land Development Program for all “New Development” and “Redevelopment” projects subject to the Order. The program is intended to accomplish the following objectives:

- Lessen the water quality impacts of development by using smart growth practices such as compact development, directing development towards existing communities via infill or redevelopment, and safeguarding of environmentally sensitive areas

- Minimize the adverse impacts from storm water runoff on the biological integrity of natural drainage systems and the beneficial uses of water bodies in accordance with requirements under CEQA

- Minimize the percentage of impervious surfaces on land developments by minimizing soil compaction during construction, designing projects to minimize the impervious area footprint, and employing Low Impact Development (LID) design principles to mimic predevelopment water balance hydrology through infiltration, evapotranspiration and rainfall harvest and use

[1] Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges Within the Coastal Watersheds of Los Angeles County, Except Discharges Originating from the City of Long Beach (MS4) to the Los Angeles County Flood Control District, the County of Los Angeles, and the 84 incorporated cities (including the City of Duarte)

- Maintain existing riparian buffers and enhance riparian buffers when possible

- Minimize pollutant loadings from impervious surfaces such as roof tops, parking lots, and roadways through the use of properly designed, technically appropriate BMPs (including Source Control BMPs such as good housekeeping practices), LID Strategies, and Treatment Control BMPs

- Properly select, design and maintain LID and Hydromodification Control BMPs to address pollutants that are likely to be generated, reduce changes to pre-development hydrology, assure long-term function, and avoid the breeding of vectors

- Prioritize the selection of BMPs to remove storm water pollutants, reduce storm water runoff volume, and beneficially use storm water to support an integrated approach to protecting water quality and managing water resources

The MS4 Permit Order specifies the criteria or thresholds for determining "New Development" and "Redevelopment Projects." The Redevelopment Projects that are subject to permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution, before completion of a project, include the following, among others:

- Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site

- Where redevelopment results in an alteration to more than 50 percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction storm water quality control requirements, the entire project must be mitigated.

- Where redevelopment results in an alteration of less than 50 percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction storm water quality control requirements, only the alteration must be mitigated, and not the entire development.

The New Development/Redevelopment Project Performance Criteria for commercial and residential activities include:

- Control pollutants, pollutant loads, and runoff volume from the project by minimizing the impervious surface area and controlling runoff from impervious surfaces through infiltration, bioretention, and/or rainfall harvest and use

- Retain on-site the Stormwater Quality Design Volume (SWQDv) from the 0.75-inch, 24-hour rain event or the 85th percentile, 24-hour rain event, as determined from the Los Angeles County 85th percentile precipitation isohyetal map, whichever is greater

- Design bioretention and biofiltration systems to meet the design specifications provided in NPDES Permit Attachment H, unless approved otherwise by the Regional Water Board Executive Officer

- When evaluating the potential for on-site retention, the maximum potential for evapotranspiration from green roofs and rainfall harvest and use shall be considered.

- If on-site retention, bioretention, and biofiltration systems are infeasible, opportunities for regional ground water replenishment offsite may be permissible.

- Implement hydrologic control measures to prevent accelerated downstream erosion and to protect stream habitat in natural drainage systems (Hydromodification), including one, or a combination of on-site, regional or sub-regional hydromodification control BMPs, LID strategies, or stream and riparian buffer restoration measures.

- Meet the Hydromodification Control Criteria by:

    - Retaining on-site the runoff volume from the 95th percentile, 24-hour storm, or
    - Post-development conditions should not exceed the pre-development conditions for the 2-year, 24-hour rainfall event, or
    - The Erosion Potential (Ep) in the receiving water channel will be approximately one, as determined by a Hydromodification Analysis Study and the equation presented in NPDES Permit Attachment J.

- If the proposed project cannot meet the previously mentioned Hydromodification Control Criteria, then it may satisfy this requirement by implementing the hydromodification requirements in the County of Los Angeles Low Impact Development Manual (2009) for all projects disturbing an area greater than one acre within natural drainage systems, or meet the watershed specific Hydromodification Control Plan, if one is developed for the Los Angeles River.

Low Impact Development

LID is a stormwater management strategy that seeks to mitigate the impacts of runoff and stormwater pollution as close to its source as possible. LID comprises a set of site design approaches and BMPs to address runoff and pollution at the source. The LID practices can effectively remove nutrients, bacteria, and metals while reducing the volume and intensity of stormwater flows.

Permittees that elect to prepare a Watershed Management Program or an Enhanced Watershed Management Program under the MS4 Permit are required to establish an LID ordinance to lessen the impacts of development by using smart growth principles and to integrate LID practices and standards for stormwater pollution mitigation through means of infiltration, evapotranspiration, biofiltration, and rainfall harvest and use for new development and redevelopment projects. Duarte utilizes the County of Los Angeles Department of Public Works Low Impact Development Standards Manual.

City of Duarte Municipal Code

Duarte Municipal Code Chapter 6.15, Stormwater and Urban Runoff Pollution Control, was adopted for the purpose of protecting the health and safety of the residents of the City and County by protecting the beneficial uses, marine and river habitats, and ecosystems of receiving waters within the County from pollutants carried by storm water and non-storm water discharges. The provisions of Chapter 6.15 apply to the discharge, deposit, or disposal of any

stormwater and/or urban runoff to the storm drain system and/or receiving waters within any incorporated areas of the City of Duarte covered by an NPDES municipal storm water permit.

Activities requiring a NPDES construction permit are subject to *Duarte Municipal Code* Section 6.15.021, Control of Pollutants from Construction Activities Requiring General Construction Activity Storm Water Permit. In accordance with Section 6.15.021, the following are required to be retained at the construction site: 1) a copy of the Notice of Intent to Comply with Terms of the General Permit to Discharge Water Associated with Construction Activity; 2) a waste discharge identification number issued by the SWRCB; 3) a Storm Water Pollution Prevention Plan and Monitoring Program Plan for the construction activity requiring the construction permit; and 4) records of all inspections, compliance and noncompliance reports, evidence of self-inspection and good housekeeping practices.

Duarte Municipal Code Section 6.15.023, Control of Pollutants from New Developments, requires new develop projects to be evaluated by the City for its potential to discharge pollutants based on its intended land use. BMPs would be required to be implemented during construction and following project completion.

5.9.2 ENVIRONMENTAL SETTING

EXISTING HYDROLOGY AND DRAINAGE CONDITIONS

Currently, one storm drain—in Highland Avenue—exists adjacent to the project site (KHR 2019). Drainage for the project site consists of surface runoff flowing in a southwesterly direction (KHR 2019). The surface runoff enters an aboveground swale located in the parking area of the most southern building. The runoff is collected through drainage grates in the swale and then outlets into a 30-inch storm drainpipe, which traverses the project site from the east (Highland Avenue) towards Three Ranch Road west of the project site. Los Angeles County Flood Control District has an easement over the existing storm drain. The existing storm drain eventually discharges into Rio Hondo/Sawpit Wash, which is located west of the project site and is ultimately tributary to the Los Angeles River.

FLOODPLAIN MAPPING AND OTHER HYDROLOGIC HAZARDS

The City of Duarte is a participant in the National Flood Insurance Program (NFIP). Communities participating in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flooding risks. Participation in the NFIP allows communities to purchase low cost insurance protection against losses from flooding. According to the Flood Insurance Rate Map, the project site is located within "Zone X," as shown on FIRM No. 06037C1415F, effective September 26, 2008. Zone X is defined as areas determined to be outside the 0.2 percent change floodplain.

According to the *General Plan* Safety Element (City of Duarte 2007), three major dams in the upper watershed of the San Gabriel River provide flood protection for the City of Duarte. Two of these dams, Cogswell Dam and San Gabriel Dam, were built in San Gabriel Canyon between 1934 and 1937, respectively. A third dam, known as Morris Dam, was constructed in 1934 by the City of Pasadena. According to the Safety Element, there is a fairly low possibly for a severe earthquake to cause flooding due to the failure of Morris, San Gabriel and/or Cogswell dams.

EXISTING STORMWATER QUALITY

The following describes the pollutants typically found in storm water runoff and the contaminants that may be found in existing storm water runoff from the project site.

Nonpoint Source Pollutants

The net effect of urbanization could be an increase in pollutant discharge over naturally occurring conditions. The higher discharge could impact adjacent streams and downstream receiving waters. However, an important consideration in evaluating storm water quality from the proposed project is to assess if it impairs the beneficial uses of the receiving waters. Nonpoint source pollutants have been characterized by the following major categories to assist with determining the pertinent data and its use. Receiving waters can assimilate a limited quantity of various constituents, but there are thresholds beyond which the measured amount becomes a pollutant and results in an undesirable impact. The descriptions of these standard water quality categories provide insight into their impacts on downstream receiving waters.

- *Sediment*. Sediment is made up of tiny soil particles that are washed or blown into surface waters. It is the major pollutant by volume in surface water. Suspended soil particles can cause the water to look cloudy or turbid. The fine sediment particles also act as a vehicle to transport other pollutants including nutrients, trace metals, and hydrocarbons. Construction sites are the largest source of sediment for urban areas under development. Another major source of sediment is streambank erosion, which may be accelerated by increases in peak rates and volumes of runoff due to urbanization.

- *Nutrients*. Nutrients are a major concern for surface water quality, especially phosphorous and nitrogen, which can cause algal blooms and excessive vegetative growth. Of the two, phosphorus is usually the limiting nutrient that controls the growth of algae in lakes. When phosphorus is in its orthophosphorus form, it is readily available for plant growth. The ammonium form of nitrogen can also have severe effects on surface water quality, when it is converted to the nitrate and nitrite forms of nitrogen in a process called nitrification. This process consumes large amounts of oxygen, which can impair the dissolved oxygen levels in water. The nitrate form of nitrogen is very soluble and is found naturally at low levels in water. When nitrogen fertilizer is applied to lawns or other vegetation in excess of plant needs, nitrates can leach below the root zone, eventually reaching ground water. Orthophosphate from auto emissions also contributes phosphorus in areas with heavy automobile traffic. As a general rule of thumb, nutrient discharge is greatest from development sites with the most impervious areas. Other problems resulting from excess nutrients are 1) surface algal scums, 2) water discoloration, 3) odors, 4) toxic releases, and 5) overgrowth of plants. The common chemical measures for nutrients are total nitrogen, organic nitrogen, total Kjeldahl nitrogen (TKN), nitrate, ammonia, total phosphate, and total organic carbon (TOC).

- *Trace Metals*. Trace metals are primarily a concern because of their toxic effects on aquatic life, and their potential to contaminate drinking water supplies. The most common trace metals found in urban runoff are led, zinc, and copper. Fallout from automobile emissions is also a major source of lead in urban areas. A large fraction of the trace metals in urban runoff are attached to sediment and this effectively reduces the level that is immediately available for biological uptake and subsequent bioaccumulation.

Metals associated with the sediment settle out rapidly and accumulate in the soils. Also, urban runoff events typically occur over a shorter duration, which reduces the amount of exposure, but could be toxic to the aquatic environment. The toxicity of trace metals in runoff varies with the hardness of the receiving water. As total hardness of the water increases, the threshold concentration levels for adverse effects increases.

- *Oxygen-Demanding Substances*. Aquatic life is dependent on the dissolved oxygen in the water, and when organic matter is consumed by microorganisms then dissolved oxygen is consumed in the process. A rainfall event can deposit large quantities of oxygen demanding substances in lakes and streams. The biochemical oxygen demand of typical urban runoff is on the same order of magnitude as the effluent from an effective secondary wastewater treatment plant. A problem from low dissolved oxygen results when the rate of oxygen-demanding material exceeds the rate of replenishment. Oxygen demand is estimated by direct measure of dissolved oxygen and indirect measures such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), oil and grease, and total organic carbon (TOC).

- *Bacteria*. Bacteria levels in undiluted urban runoff exceed public health standards for water contact recreation almost without exception. Studies have found that total coliform counts exceeded EPA water quality criteria at almost every site and almost every time it rained. The coliform bacteria that are detected may not be a health risk but are often associated with human pathogens.

- *Oil and Grease*. Oil and grease contain a wide variety of hydrocarbons, some of which could be toxic to aquatic life in low concentrations. These constituents initially float on water and create the familiar rainbow-colored film. Hydrocarbons have a strong affinity for sediment and quickly become absorbed in it. The major source of hydrocarbons, primarily crankcase oil and other lubricating agents, in urban runoff is from leaking automobile engines. Hydrocarbon levels are highest in the runoff from parking lots, roads, and service stations. Residential land uses typically have a lower discharge of hydrocarbons; however, the illegal disposal of waste oil into storm drains and urban runoff can be a local problem.

- *Other Toxic Chemicals*. Priority pollutants are generally related to hazardous wastes or toxic chemicals and can sometimes be detected in storm water. Priority pollutant test have been conducted in previous studies of urban runoff, which evaluated the presence of over 120 toxic chemicals and compounds. The scans rarely revealed toxins that exceeded the current safety criteria and were primarily conducted in suburban areas not expected to have many sources of toxic pollutants (with the possible exception of illegally disposed or applied household hazardous wastes). Measures of priority pollutants in storm water include: 1) phthalate (plasticizer compound), 2) phenols and creosols (wood preservatives), 3) pesticides and herbicides, 4) oils and greases, and 5) metals.

Physical Characteristics of Surface Water Quality

The quantity of a material in the environment and its characteristics determine the degree of availability as a pollutant in surface runoff. Standard parameters have been developed to assess the quality of storm water. In an urban environment, the quantity of certain pollutants in the environment is a result of the land use intensity. For instance, a high density of automobile

traffic makes a number of potential pollutants, such as lead and hydrocarbons, more available. The availability of a material, such as fertilizer, is a function of the quantity and the manner in which it is applied. Applying fertilizer in quantities that exceed plant needs leaves the excess nutrients available for loss to surface or ground water.

The physical properties and chemical constituents of water have traditionally served as the primary means for monitoring and evaluating water quality. Evaluating the condition of water through a water quality standard refers to its physical, chemical, or biological characteristics. The lengthy list of storm water quality parameters is classified in multiple ways. Typically, the concentration of an urban pollutant, rather than the annual load of that pollutant, is needed to assess a water quality problem. Some of the physical, chemical, or biological characteristics typically used to evaluate the quality of surface runoff are listed below.

- *Dissolved Oxygen*. Dissolved oxygen in the water has a pronounced effect on the aquatic organisms and the chemical reactions that occur. It is one of the most important biological water quality characteristics in the aquatic environment. The dissolved oxygen concentration of a water body is determined by the solubility of oxygen, which is inversely related to water temperature, pressure, and biological activity. Dissolved oxygen is a transient property that can fluctuate rapidly in time and space and represents the status of the water system at a particular point and time of sampling. The decomposition of organic debris in water is a slow process and the resulting changes in oxygen concentrations also respond slowly. The oxygen demand is an indication of the pollutant load and includes measurements of biochemical oxygen demand or chemical oxygen demand.

- *Biochemical Oxygen Demand (BOD)*. The biochemical oxygen demand (BOD) is a measurement of the oxygen-demanding properties of the biodegradable material in the water. Samples are taken from the field and incubated in the laboratory at 20°C, after which the residual dissolved oxygen is measured. The BOD value commonly referenced is the standard five-day values. These values are useful in assessing stream pollution loads and for comparison purposes.

- *Chemical Oxygen Demand*. The chemical oxygen demand (COD) is a measure of the pollutant loading in terms of complete chemical oxidation using strong oxidizing agents. It can be determined quickly because it does not rely on bacteriological actions as with BOD. COD does not necessarily provide a good index of oxygen demanding properties in natural waters.

- *Total Dissolved Solids (TDS)*. TDS concentration is determined by evaporation of a filtered sample to obtain residue whose weight is divided by the sample volume. The TDS of natural waters varies widely. It is an important indicator of water quality because it affects the ionic bonding strength related to other pollutants such as metals in the water. TDS is also a major determinant of aquatic habitat, affects the saturation concentration of dissolved oxygen, and influences the ability of a water body to assimilate wastes. Eutrophication rates depend on total dissolved solids.

- *pH*. The pH of water is the negative log, base 10, of the hydrogen ion (H+) activity. A pH of 7 is neutral, a pH greater than 7 indicates alkaline water, and a pH less than 7 represents acidic water. In natural water, carbon dioxide reactions are some of the most important in establishing pH. The pH at any one time is an indication of the balance of

chemical equilibrium in water and affects the availability of certain chemicals or nutrients in water for uptake by plants. The pH of water directly affects fish and other aquatic life and generally toxic limits are pH values less than 4.8 and greater than 9.2.

- *Alkalinity*. Alkalinity is the opposite of acidity, representing the capacity of water to neutralize acid. Alkalinity is also linked to pH and is caused by the presence of carbonate, bicarbonate, and hydroxide, which are formed when carbon dioxide is dissolved. A high alkalinity is associated with a high pH and excessive solids. Most streams have an alkalinity concentration of less than 200 mg/l and ranges of 100-200 mg/l seem to support well-diversified aquatic life.

- *Specific Conductance*. The measurement of water's specific conductivity, or its ability to conduct an electric current, is related to the total dissolved ionic solids concentration. Long term monitoring of a water body may show a relationship between specific conductivity and TDS. Its measurement is quick and inexpensive and can be used to approximate TDS. A specific conductivity measurement in excess of 2,000 µohms/cm indicates a TDS level too high for most freshwater fish.

- *Turbidity*. The clarity of water is an important indicator of water quality that relates to the alkalinity of photosynthetic light to penetrate the fluid. Turbidity is also a measure of light that is scattered or absorbed and is caused by suspended clays and other organic particles. It can be used as an indicator of certain water quality constituents such as predicting the sediment concentrations.

- *Nitrogen (N)*. Sources of nitrogen in storm water include organic matter in water bodies or chemical discharges and occur in many forms. Ammonia and nitrate are important nutrients for the growth of algae and other plants. Excessive nitrogen can lead to eutrophication since nitrification consumes dissolved oxygen in the water. Organic Nitrogen breaks down into ammonia, which eventually becomes oxidized to nitrate-nitrogen, a form available for plants. High concentrations of nitrate-nitrogen (N/N) in water can stimulate the growth of algae and other aquatic plants, but if phosphorus (P) is present, only about 0.30 mg/l of nitrate-nitrogen is needed for algal blooms. Some fish life can be affected when nitrate-nitrogen exceeds 4.2 mg/l. There are a number of ways to measure the various forms of aquatic nitrogen. Typical measurements of nitrogen include Kjeldahl nitrogen (organic nitrogen plus ammonia), ammonia, nitrite plus nitrate, nitrite, and nitrogen in plants. The principal water quality criteria for nitrogen focus on nitrate and ammonia.

- *Phosphorus (P)*. Phosphorus is an important component of organic matter. In many water bodies, phosphorus is the limiting nutrient that prevents additional biological activity from occurring. The origin of this constituent in urban storm water discharge is generally from fertilizers and other industrial products. Orthophosphate is soluble and is considered to be the only biologically available form of phosphorus. Since phosphorus is typically found in solid particles and is a significant part of organic material, the concentration of sediment in water is an important component of the phosphorus cycle in streams. The key measurements of phosphorus include detecting orthophosphate and total phosphorus.

EXISTING STORM WATER QUALITY CONDITIONS

No data is known to be available regarding storm water runoff quality from the project site. Thus, in the absence of site-specific data, expected storm water quality can be qualitatively discussed by relating typical pollutants to specific land uses. The project site includes buildings, asphalt parking lots, and partially vegetated soil areas. Existing on-site uses are assumed to generate pollutants, such as suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/virus), pesticides, oil and grease, toxic organic compounds, and trash and debris.

The project site does not contain any structural BMPs which would potentially decrease the pollutant concentrations in storm water runoff (due to the age of the on-site improvements). Conveying flows over land through vegetation affords some infiltration and biofiltration of runoff and thus, potential pollutant removal. However, a disadvantage to conveying flows over land is that it causes erosion of the soil and thus increases suspended solids in the runoff.

Beneficial Uses, Impairments, and TMDLs

The LARWQCB defined the beneficial uses of its waterbodies in the amended *Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (2018)[2]. Beneficial uses are the uses of water necessary for the survival or well-being of humans, plants, and wildlife. If pollutant concentrations in waterbodies cause impairments to their beneficial uses, then the waterbody is placed on the State of California's list of impaired waterbodies (303(d) List) until a TMDL is established for the waterbody (maximum discharge of pollutants). The following beneficial uses have been identified for the Sawpit Wash/Rio Hondo:

- Municipal and Domestic Supply
- Ground Water Recharge
- Water Contact Recreation
- Warm Freshwater Habitat (WARM)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- High Flow Suspension

The Sawpit Wash/Rio Hondo are impaired for bis(2-ethylhexyl) phthalate (DEHP), coliform bacteria, aluminum, fecal coliform, iron, copper, lead, toxicity, trash, zinc, pH, cyanide, and dissolved oxygen. The Rio Hondo confluences with the Los Angeles River approximately 18 miles southwest of the project site, which is on the 2014/2016 303(d) List for ammonia, copper, indicator bacteria, lead, nutrients (algae), oil, and trash.

5.9.3 SIGNIFICANCE THRESHOLD CRITERIA

The issues presented in the Initial Study Environmental Checklist (*CEQA Guidelines* Appendix G) have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

[2] After approval of the 303(d) List portion of the California Integrated Report by the State Water Board, the complete 2014 and 2016 California Integrated Report was submitted to U.S. EPA for final approval of the California 303(d) List. The California 303(d) List was approved by USEPA on April 6th, 2018.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water 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 which would:

    - result in a substantial erosion or siltation on- or off-site
    - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite
    - 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
    - impede or redirect flood flows?

- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; and/or

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impacts on groundwater supply and management are discussed in Chapter 5.14 (Water).

Based on these standards, the proposed project's effects have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact.

5.9.4 PROJECT IMPACTS AND MITIGATION MEASURES

WATER QUALITY – SHORT-TERM IMPACTS

GRADING, EXCAVATION, AND CONSTRUCTION ACTIVITIES ASSOCIATED WITH IMPLEMENTATION OF THE PROPOSED PROJECT COULD SIGNIFICANTLY IMPACT WATER QUALITY.

Impact Analysis: There are three sources of short-term construction-related storm water pollution associated with development of the proposed project that could impact the beneficial uses of downstream water bodies:

- Handling, storage, and disposal of construction materials containing pollutants
- Maintenance and operation of construction equipment
- Earthmoving activities

These sources, if not controlled, can generate soil erosion and on- and off-site transport via storm run-off or mechanical equipment. Poorly maintained vehicles and heavy equipment leaking fuel, oil, antifreeze, or other vehicle-related fluids on the project site are also common sources of storm water pollution and soil contamination. Implementation of the proposed project has the potential to produce typical pollutants such as nutrients, heavy metals, pesticides and herbicides, toxic chemicals related to construction and cleaning, waste materials including wash water, paints, wood, paper, concrete, food containers, and sanitary wastes, fuel, and lubricants. Generally, standard safety precautions for handling and storing construction materials can adequately reduce the potential pollution of storm water by these materials. These types of standard procedures can be extended to non-hazardous storm water pollutants such as sawdust, concrete washout, and other wastes.

In addition, grading activities can greatly increase erosion processes, leading to impacts on storm drains and sediment loading to storm runoff flows. Two general strategies are recommended to prevent soil materials from entering local storm drains. First, erosion control procedures should be implemented for those areas that must be exposed, and second, the project site should be secured to control off-site transport of pollutants.

To reduce the amount of on-site exposed soil, grading would be limited to the extent feasible, and any graded areas would be protected against erosion once they are brought to final grade. Furthermore, development associated with implementation of the proposed project would be required to comply with the Construction General NPDES Permit. Prior to construction, the General Permit requires the following:

- Electronic submittal of the Permit Registration Documents (PRD) to the SWRCB at least 30 days before the start of construction, which includes submittal of a Notice of Intent (NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement
- Preparation and implementation of a SWPPP
- Electronic submittal of a Notice of Termination (NOT) to the SWRCB upon completion of construction and stabilization of the site

Construction activities for development associated with implementation of the proposed project would be subject to inspection by the City Public Works/Engineering Department. The General Permit requires that non-storm water discharges from construction sites be eliminated or reduced to the maximum extent practicable, that a SWPPP be developed governing construction activities for the proposed project, and that routine inspections be performed of all storm water pollution prevention measures and control practices being used at the site, including inspections before and after storm events. These are standard regulations that would be applied to all development projects. Thus, potential water quality impacts associated with construction activities would be reduced to a less than significant level.

Mitigation Measures: No mitigation is required with application of standard regulatory requirements.

Level of Significance: Less Than Significant Impact.

LONG-TERM OPERATIONAL IMPACTS

IMPLEMENTATION OF THE PROPOSED PROJECT COULD RESULT IN SIGNIFICANT IMPACTS RELATED TO INCREASED RUN-OFF AMOUNTS AND DEGRADED WATER QUALITY.

Impact Analysis: This section analyzes the proposed project conditions and compares them to the existing conditions to determine resultant impacts on drainage, run-off, and water quality.

Proposed Storm Water Drainage

The majority of the project area is currently developed with hardscape and structures, with very limited pervious surface area. Buildout of project area is anticipated to increase landscape coverage throughout the Specific Plan area, and development will be required to include features to capture runoff on site and ensure any discharge meets current RWQCB standards.

For example, the developer of the proposed Residences at Duarte Station project proposes to install a private storm drain system to reduce the quantity of stormwater discharged (Figure 5.9-1, KHR 2019). Stormwater infiltration has been determined to be feasible for the project site. Stormwater infiltration practices operate by capturing and temporarily storing stormwater, before allowing it to infiltrate into the underlying soil. A perforated corrugated metal pipe (CMP) would be installed on the northwesterly and northeasterly corner of the site to store the stormwater mitigation volume captured within the project site for infiltration into the underlying soils. The stormwater would be collected by a proposed private storm drainage system. For each subarea, the stormwater quality design flow would be diverted into a clarifying unit for pretreatment prior to infiltration.

Peak discharges were computed for the estimated 85th percentile, 24-hour rain event hypothetical storm return frequency for this potential development project. The LID report concludes that this could adequately capture and treat runoff generated by buildout of The Residences at Duarte Station project.

Compared to the existing condition, the use of the on-site storage and infiltration tanks would decrease the amount of stormwater discharging into the public storm drain system, and the dry wells would adequately capture and treat runoff generated by the proposed project.

Future development in the remaining Specific Plan area would also likely decrease the amount of imperviousness. Future projects would also require to stormwater capture on site, resulting in a decrease in stormwater discharge. All development would be required to comply with the MS4 permit during operations. Thus, potential run-off impacts would be less than significant.

Water Quality

The long-term operation and maintenance of the proposed project would be a source of pollutants, including suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/virus), pesticides, oil and grease, toxic organic compounds, trash and debris, and household hazardous wastes. The vegetated areas are likely to produce suspended solids/sediment, nutrients, and pesticides. The beneficial uses of downstream water bodies could be impacted due to development within the plan area. Therefore, development associated with implementation of the proposed project would be required to prepare and implement a plan (i.e., SUSMP or functional equivalent document) in accordance with the guidance to be developed by the NPDES Permit permittees, that includes post-construction

BMPs (such as LID, if feasible) to reduce pollutant loading. This plan, included as Mitigation Measure HYD-1, would be required prior to issuance of a grading permit. The post-construction BMPs may include, but are not limited to:

- Bioretention
- Rainfall harvest and use (i.e., cisterns, rain barrels, planter areas, permeable surfaces, drywells, French drains, etc.)
- Vegetated swales
- Vegetated filter strips
- Green roofs
- Infiltration trenches
- Media filtration
- Permeable surfaces (i.e., porous concrete/asphalt, Hollywood driveways, block pavers, open cell concrete, plastic grid systems, reinforced turf, etc.)
- Other BMPs that may be approved by the City of Duarte or the county-wide program in the future to address the NPDES Permit requirements

Since the Sawpit Wash/Rio Hondo is a hardened channel, the proposed project would not have to include hydromodification controls. Based on the information currently available, the plan should include non-structural and structural BMPs to mitigate the estimated 85th percentile, 24-hour rain event (Office of Water Programs, California State University, Sacramento, 2007). Preparation and compliance with the plan reduce potential water quality impacts to a less than significant level. No mitigation is required.

Mitigation Measures:

HYD-1 Concurrent with Site Plan Review or issuance of a grading permit, whichever comes first, a hydrology review shall be conducted by a Registered Civil Engineer for each development phase to ensure that runoff values for each phase remain at or below existing runoff values in compliance with current State law or other applicable statutes.

Level of Significance: Less Than Significant Impact with Mitigation Incorporated.

LEGEND

SUBAREA BOUNDARY

X
X.XX AC
SUBAREA LABEL

SITE INFORMATION

AREA A

TOTAL AREA: 188,986 S.F. (4.34 ACRES)
MITIGATION VOLUME: 15,844 C.F. (118,521 GAL.)

AREA B

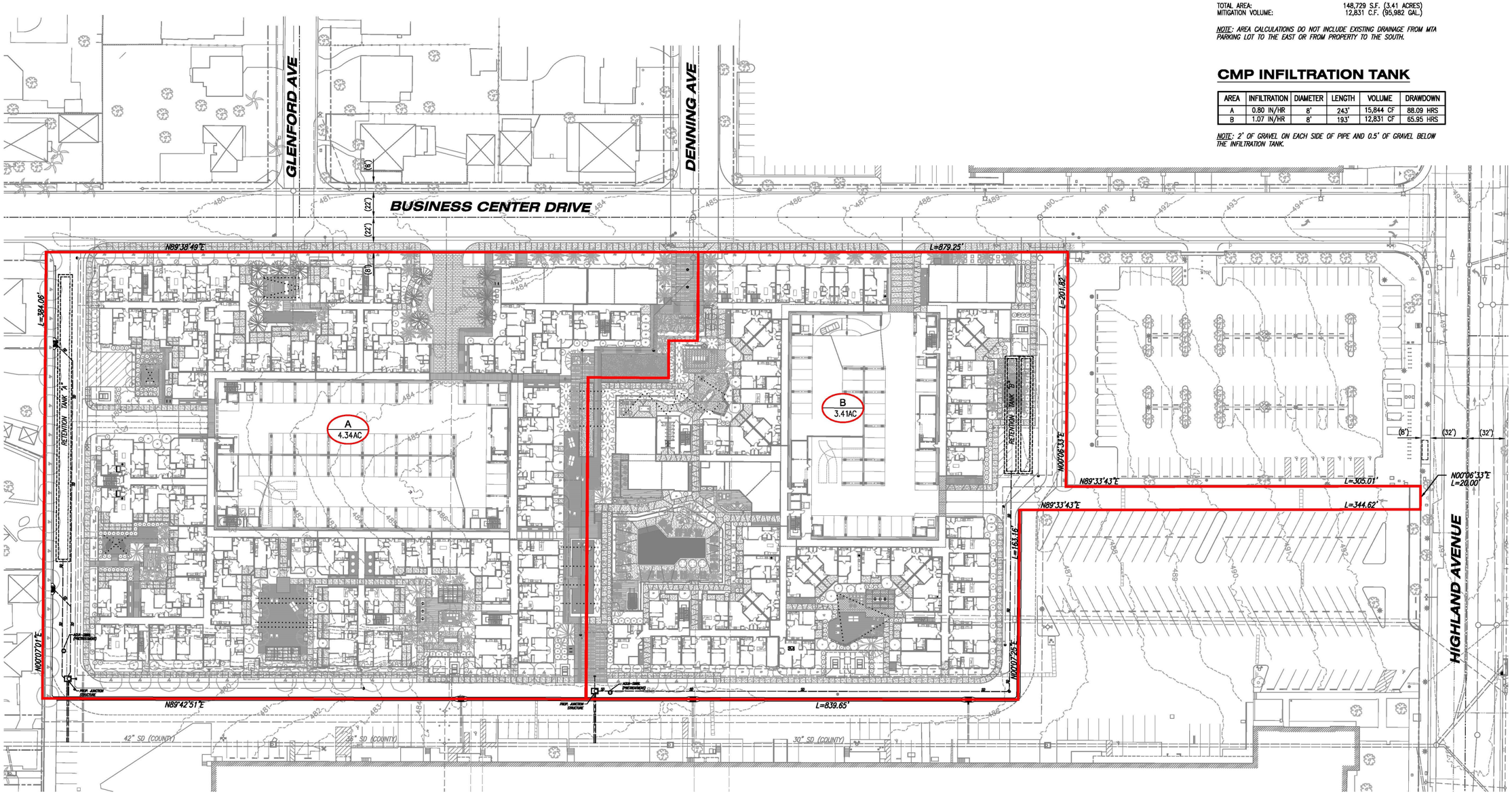
TOTAL AREA: 148,729 S.F. (3.41 ACRES)
MITIGATION VOLUME: 12,831 C.F. (95,982 GAL.)

NOTE: AREA CALCULATIONS DO NOT INCLUDE EXISTING DRAINAGE FROM MTA PARKING LOT TO THE EAST OR FROM PROPERTY TO THE SOUTH.

CMP INFILTRATION TANK

AREA	INFILTRATION	DIAMETER	LENGTH	VOLUME	DRAWDOWN
A	0.80 IN/HR	8'	243'	15,844 CF	88.09 HRS
B	1.07 IN/HR	8'	193'	12,831 CF	65.95 HRS

NOTE: 2' OF GRAVEL ON EACH SIDE OF PIPE AND 0.5' OF GRAVEL BELOW THE INFILTRATION TANK.



Source: KHR Associates, 2019

0 20 40 80 120
SCALE: 1"=40' DATE: 04/24/19

Figure 5.9-1Preliminary LID/Surface Hydrology Plan, The Residences at Duarte Station

FLOODING AND OTHER HYDROLOGIC HAZARDS

IMPLEMENTATION OF THE PROPOSED PROJECT COULD RESULT IN:

- **Placement of housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;**
- **Placement of structures within a 100-year flood hazard area which would impede or redirect flood flows; and/or**
- **Exposure of people or structures to a significant risk of loss, injury or death involving flooding including flooding as a result of the failure of a levee or dam; or**
- **Exposure of people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.**

The project area is not located within a 100-year flood hazard area. It is, however, located within the inundation areas for the San Gabriel Reservoir and Sawpit Dam. A rupture of these dams (i.e., in the event of an earthquake, seiche, or catastrophic failure during a rain event) could result in inundation of the project area. However, these reservoirs, as well as others in California, are continually monitored by various governmental agencies (such as the State of California Division of Safety of Dams and the U.S. Army Corps of Engineers) to guard against the threat of dam failure. Current design, construction practices, and ongoing programs of review, modification, or total reconstruction of existing dams are intended to ensure that all dams are capable of withstanding the maximum considered earthquake for the site. Therefore, the potential for dam failure is considered low. Also, evacuation plans have been developed in dam inundation areas by the County of Los Angeles Office of Emergency Management in emergency response plans. Therefore, impacts on safety as a result of a dam failure is also considered low. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance: Less Than Significant Impact.

5.9.5 CUMULATIVE IMPACTS AND MITIGATION MEASURES

IMPLEMENTATION OF THE PROPOSED PROJECT ALONG WITH OTHER RELATED CUMULATIVE PROJECTS COULD RESULT IN CUMULATIVELY CONSIDERABLE IMPACTS RELATED TO INCREASED RUNOFF AND DEGRADED WATER QUALITY.

Impact Analysis: Implementation of the proposed project along with other related cumulative projects would have the potential to increase runoff and affect water quality during construction and long-term operations.

Higher flows resulting from future development in the watershed would result in drainage and runoff impacts. Runoff from some of the cumulative projects could drain into the conveyance systems used by the proposed project. Although runoff from some of the cumulative projects may not interact with runoff from future development within the plan area, interaction could occur downstream. Future development would be required to account for higher flows within the watershed on a project-by-project basis.

Each individual project would be required to submit individual analyses to their respective jurisdictions for review and approval prior to issuance of grading or building permits. Each analysis must illustrate how peak flows generated from each related project site would be accommodated by the existing and/or proposed storm drainage facilities. The proposed project would result in decreased runoff when compared to existing conditions. Thus, the proposed project would not result in cumulatively considerable impacts associated with drainage and runoff. Impacts would be less than significant.

Cumulative projects have the potential to affect water quality during the construction phase and long-term operations and would contribute storm water flows to the local and regional drainage facilities. Development of the proposed project, along with related cumulative projects, would result in increased potential for short- and long-term operational water quality impacts within the area. However, the project and cumulative development must adhere to NPDES requirements and implement a SWPPP with specific BMPs during construction activities. Additionally, the proposed project and cumulative development must adhere to NPDES requirements and implement a SUSMP with specific BMPs for post-construction conditions. Each project would also be required to comply with existing water quality standards at the time of development review and include BMPs, as necessary. Therefore, the short- and long-term impacts on surface water quality associated with cumulative development would not be cumulatively considerable with adherence to NPDES and *Municipal Code* requirements. Less than significant impacts are anticipated in this regard.

Mitigation Measures: Refer to Mitigation Measures HYD-1. No additional mitigation measures are required.

Level of Significance: Less Than Significant Impact.

5.9.6 SIGNIFICANT UNAVOIDABLE IMPACTS

Implementation of the proposed project would result in less than significant project and cumulative impacts related to hydrology and water quality during both construction and operation with adherence to the identified mitigation measure and compliance with and compliance with the applicable Federal, State, and local regulatory requirements. As such, no significant unavoidable impacts would result from implementation of the Duarte Station Specific Plan.

5.9.7 SOURCES CITED

California-American Water Southern Division - Los Angeles County District, *Duarte Station Specific Plan Draft Water Supply Assessment for the Duarte Station Specific Plan*, June 13, 2019

City of Duarte, *Safety Element of the Duarte General Plan*, August 2007.

KHR Associates, *Preliminary LID Report for The Residences at Duarte Station*, April 24, 2019