10 HYDROLOGY AND WATER QUALITY

10.1 INTRODUCTION

The Hydrology and Water Quality chapter of the EIR describes existing drainage patterns on the proposed project site and downstream waterways, existing stormwater infrastructure, and potential for flooding. The chapter evaluates potential impacts of the proposed project with respect to increases in impervious surface area and associated stormwater flows, degradation of water quality, groundwater recharge, and on- and off-site flooding. Information used for this chapter was primarily drawn from a Preliminary Hydrologic and Hydraulic Study[1] and a Preliminary Post-Construction Storm Water Quality Plan (SWQP)[2] prepared for the proposed project by TSD Engineering, Inc. (see Appendices I and J, respectively), as well as a supplemental Hydrologic Impact Analysis prepared by Michael S. Thomas, P.E., dated November 13, 2017.[3] In addition, information was drawn from the Placer County General Plan,[4] the Placer County General Plan EIR,[5] the Dry Creek-West Placer Community Plan (DCWPCP),[6] the *Dry Creek Watershed Coordinated Resource Management Plan* (DCWCRMP),[7] and the *Update to the Dry Creek Watershed Flood Control Plan*.[8] It should be noted that impacts associated with water supply and capacity are addressed in Chapter 16, Utilities and Service Systems, of this EIR.

10.2 EXISTING ENVIRONMENTAL SETTING

The section below describes the existing hydrological features of the project site and the surrounding region, as well as the water quality of the existing resources in and around the project site.

Regional Hydrology

The project site is located within the DCWPCP plan area within Placer County, California. According to the DCWPCP, the hydrologic characteristics in the plan area are largely affected by seasonal rainfall. The majority of the watercourses in the area are seasonal, and only support flows

1 TSD Engineering, Inc. *Providence Park Subdivision Preliminary Hydrologic and Hydraulic Study.* February 17, 2017.
2 TSD Engineering, Inc. *Preliminary Post-Construction Storm Water Quality Plan For: Providence Park Subdivision, Placer County, Ca.* September 22, 2016.
3 Michael S. Thomas, P.E. *Mill Creek Subdivision, Hydrologic Impact Analyses and Response to the EIR Consultant Questions*. November 13, 2017.
4 Placer County. *Countywide General Plan Policy Document.* August 1994 (updated May 2013).
5 Placer County. *Countywide General Plan EIR*. July 1994.
6 Placer County. *Dry Creek-West Placer Community Plan*. Amended May 12, 2009.
7 Placer and Sacramento Counties. *Dry Creek Watershed Coordinated Resource Management Plan.* December 31, 2003.
8 Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan.* November 2011.

during the rainy season. However, Dry Creek, the largest water feature within the DCWPCP area, is located approximately 1,850 feet north of the project site and flows year-round. Dry Creek is part of the larger Dry Creek watershed, which drains approximately 101 square miles.[9] The watershed begins west of Auburn and drains into Steelhead Creek. Flows from Steelhead Creek discharge to the American River, and ultimately to the Sacramento River.

According to the DCWCRMP, higher peak flows and total storm flows are not being adequately conveyed through stream channels (and structures) within the Dry Creek watershed that were originally developed (or were modified) for conveyance of lower flows. This results in localized flooding. Additionally, several areas within the watershed have degrading/unstable banks, incising streams, and are experiencing sedimentation of the streambed due, in part, to the modified flow regime caused by increases in impervious surface area that have occurred as a result of development activities in the area.

Modification of watershed hydrology is also compounded by modification of the instream configuration by channelization, levees, dredging, structures (dams, bridges, other), and reduced floodplain area. Such modifications also result in altered stream flow where flow is faster in some areas, contributing to erosion and faster peak flow timing, but slower in other areas (behind dams and other impeding structures), contributing to flooding and sediment deposition.

Dry Creek has an extensive record of flooding and flood damage to areas within the lower portion of the creek's watershed. Historic flooding in the area occurred in 1986, 1995, and 1997. Flooding generally occurs from October through April, when soils become saturated during winter rain events followed by high intensity storm systems. The lower portion of Dry Creek is characterized by high peak flows of moderate duration. Flooding from cloudburst storms of high intensity can occur from late spring to early fall; however, runoff resulting from the summer storms tends to be significantly less in peak and volume. Though significant progress has been made towards reducing flood risks in the Dry Creek watershed through the implementation of local improvement projects, including bridge replacements, flow bypasses, building elevation projects and residential buyouts, numerous flood hazard areas and roadway stream crossings still do not have adequate capacity.[10]

Proposed Project Site Hydrology

The proposed project site consists of 110.1 acres located entirely within the Dry Creek watershed. Stormwater flows currently leave the project site and enter Dry Creek through two distinct paths. The most prominent is the riparian corridor, which lies adjacent to the eastern boundary of the site and parallels two unnamed tributaries to Dry Creek; the tributaries flow northward through a box culvert under PFE Road and into Dry Creek to the north of the site. The second path is a natural drainage swale on the north side of PFE Road, which receives flows from the project site and adjacent off-site areas and crosses PFE Road approximately 750 feet to the west of the intersection

[9] Placer and Sacramento Counties. *Dry Creek Watershed Coordinated Resource Management Plan.* December 31, 2003.

[10] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. ES-2]. November 2011.

of Antelope Road and PFE Road. Such off-site areas total approximately 40.6-acres. With the exception of the riparian corridor, the site is generally defined by expansive, gently rolling grasslands. While portions of the site have been previously developed with single-family residences, orchard trees, and various structures, overall, the site includes a relatively insignificant amount of impervious surface relative to the total site area.

As part of the hydrology analysis performed by Michael S. Thomas, for comparative purposes, the project site was divided into three basic areas roughly corresponding to the three phases of the project, but respecting the grade breaks of the natural terrain and the proposed grading of the site which conforms closely to the current site condition. The three areas are referred to as Shed A, Shed B and Shed C relating to the West Village, the Central Village and the East Village, respectively. Because of the existing grade breaks, Shed A encompasses all the West Village and a portion of the Central Village. Shed B encompasses the balance of the Central Village and Shed C encompasses all of the East Village.

Runoff from Shed A drains from west to east and from east to west towards an existing natural flow channel that is located centrally within Shed A and which extends and flows from south to north passing under PFE Road and then on to Dry Creek. Runoff from Shed B drains generally from the northwest to the southeast and follows along the west side of PFE Road, entering Sacramento County for a short distance before turning to the northeast and reentering the site. Shed C drains generally from west to east to the existing riparian corridor, where runoff then flows north to cross under PFE Road, ultimately discharging to Dry Creek. Specific discharge locations and shed areas are shown in Figure 10-1 below.

Peak Flow Characteristics

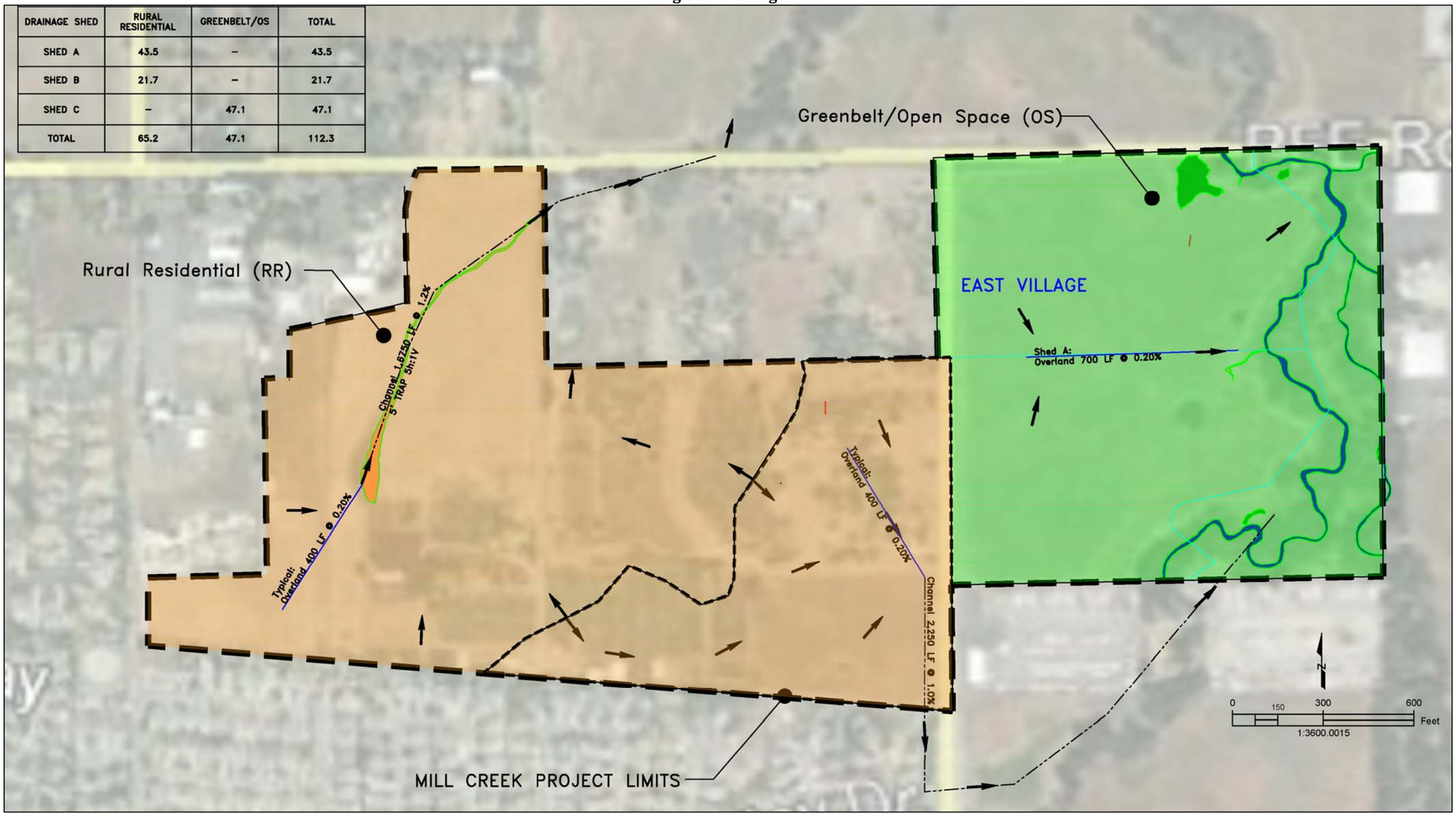
The site is dominated by soils belonging to the Group D hydrologic soil category, although soils from Group B are present within the Dry Creek floodplain. Soils in hydrologic Group D are characterized by slow infiltration rates. Stormwater runoff estimates for existing conditions on the project site are summarized in Table 10-1 below. Flows are expressed in units of cubic feet per second (cfs). The local reach of Dry Creek within the project vicinity has a 100-year peak flow of approximately 13,079 cfs.[11]

Project Site Flooding Risk

The project site is located within the area shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) Map Number 06061C1027H. However, FEMA has not studied the entire Placer Greens property. In order to determine flood hazards associated with the riparian corridor, the hydrology analysis conducted for the project by Michael S. Thomas included modeling of the 100-year flood event within the project area (see Figure 10-2). As shown in the figure, only the extreme northeast portion of the site lies within the 100-year floodplain.

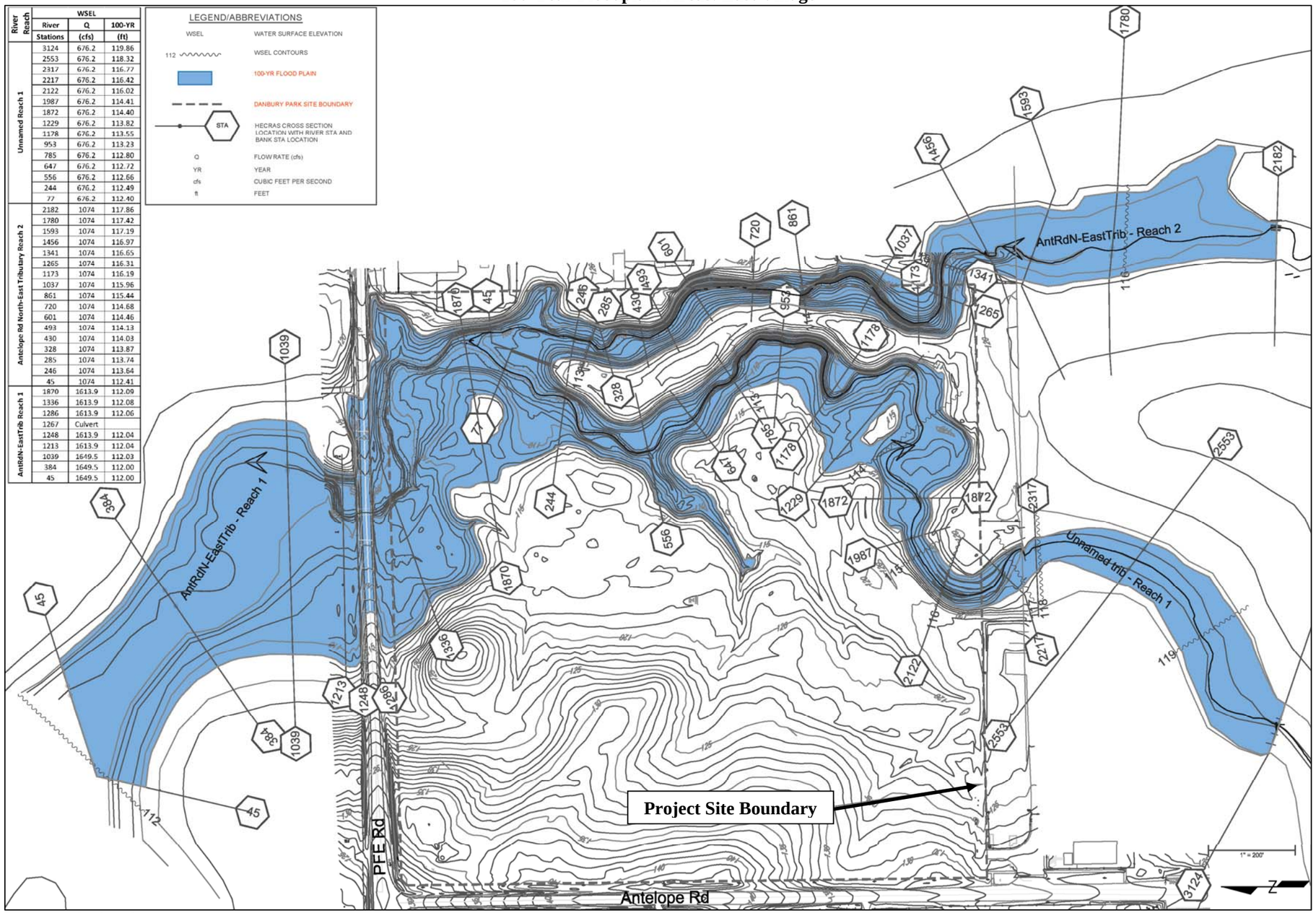
[11] Michael S. Thomas, P.E. *Mill Creek Subdivision, Hydrologic Impact Analyses and Response to the EIR Consultant Questions* [pg. 1]. November 13, 2017.

Figure 10-1
Existing Site Drainage



Source: Michael S. Thomas, P.E., 2017.

Figure 10-2
100-Year Floodplain Areas: East Village



River Reach	WSEL River Stations	Q (cfs)	100-YR (ft)
Unnamed Reach 1	3124	676.2	119.86
	2553	676.2	118.32
	2317	676.2	116.77
	2217	676.2	116.42
	2122	676.2	116.02
	1987	676.2	114.41
	1872	676.2	114.40
	1229	676.2	113.82
	1178	676.2	113.55
	953	676.2	113.23
	785	676.2	112.80
	647	676.2	112.72
	556	676.2	112.66
	244	676.2	112.49
	77	676.2	112.40
Antelope Rd North-East Tributary Reach 2	2182	1074	117.86
	1780	1074	117.42
	1593	1074	117.19
	1456	1074	116.97
	1341	1074	116.65
	1265	1074	116.31
	1173	1074	116.19
	1037	1074	115.96
	861	1074	115.44
	720	1074	114.68
	601	1074	114.46
	493	1074	114.13
	430	1074	114.03
	328	1074	113.87
	285	1074	113.74
	246	1074	113.64
	45	1074	112.41
AntRdN-EastTrib Reach 1	1870	1613.9	112.09
	1336	1613.9	112.08
	1286	1613.9	112.06
	1267	Culvert	
	1248	1613.9	112.04
	1213	1613.9	112.04
	1039	1649.5	112.03
	384	1649.5	112.00
	45	1649.5	112.00

Source: Michael S. Thomas, P.E., 2017.

Table 10-1
Peak Flow Characteristics – Existing Condition

Drainage Shed	Peak Runoff (cfs)	Volume (inches)
2-Year Return Frequency Storm		
A	10.8	1.38
B	8.5	1.33
C	16.6	0.63
10-Year Return Frequency Storm		
A	41.7	2.56
B	18.6	2.48
C	38.8	1.38
25-Year Return Frequency Storm		
A	57.2	3.21
B	25.3	3.13
C	53.5	1.85
100-Year Return Frequency Storm		
A	81.6	4.44
B	36.4	4.35
C	77.6	2.62

Note: For the existing condition, Shed A area is 43.5 acres, Shed B area is 21.7 acres, and Shed C area is 41.7 acres.

Source: Michael S. Thomas, P.E., 2017.

Water Quality

Land uses and activities that the County must consider in protecting the quality of the County's water due to their associated potential for pollutants to enter the waterways include construction activities and urban runoff.

Construction activities have the potential to cause erosion and sedimentation associated with groundbreaking and clearing activities, which could cause unstabilized soil to be washed or wind-blown into nearby surface water. In addition, the use of heavy equipment during construction activities, especially during rainfall events, could cause petroleum products and other pollutants to enter nearby drainages.

Water quality degradation from urban stormwater runoff is primarily the result of runoff carrying pollutants from the land surface (i.e., streets, parking lots, pastures) to the receiving waters (i.e., streams and lakes). Pollutants typically found in urban runoff include household and lawn-care chemicals (insecticides, herbicides, fungicides and rodenticides), heavy metals (such as copper, zinc and cadmium), oils and greases, and nutrients (nitrogen and phosphorus). As discussed in Chapter 9, Hazards and Hazardous Materials, of this EIR, elevated concentrations of pesticides have been detected in soils on the Haight property within the project site. In addition, at the time of a site reconnaissance survey conducted on August 12, 2014, a bulk fertilizer tank was located on the Haight property.

Groundwater

As discussed in Chapter 8, Geology and Soils/Mineral Resources, of this EIR, permanent groundwater was not encountered during a series of borings conducted on the proposed project site. Per available California Department of Water Resources (DWR) records for a well approximately 0.5-mile northwest of the project site, ground measurements obtained from the well indicated a historic high groundwater elevation of approximately 62 feet above mean sea level (msl) (approximately 80 feet below existing grades at the well) and a low groundwater elevation of minus one msl (approximately 143 feet below existing grades at the well). Based on the elevation of the project site (110 to 160 feet msl), the permanent groundwater table is likely to be at least 100 feet below the existing ground surface of the site.

Groundwater levels in southwestern Placer County and northern Sacramento County have generally decreased in recent history, with many wells experiencing declines at a rate of approximately 1.5 feet per year.[12] However, per the San Juan Water District *2015 Urban Water Management Plan*, the North American Subbasin, within which the project site is located, is not identified by the DWR as being in a state of overdraft.[13] Groundwater overdraft is a condition within a developed groundwater basin in which the amount of water pumped from the basin exceeds the sustainable yield of the basin over the long term.

10.3 REGULATORY CONTEXT

The following is a description of federal, State, and local environmental laws and policies that are relevant to the review of hydrology and water quality under the California Environmental Quality Act (CEQA) process.

Federal Regulations

The following section includes federal environmental regulations relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

Federal Emergency Management Agency

The FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. FEMA is also responsible for distributing the FIRMS, which are used in the National Flood Insurance Program (NFIP). The FIRMs identify the locations of special flood hazard areas, including the 100-year floodplains.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within flood hazard areas, depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through

[12] California Department of Water Resources. *California's Groundwater, Bulletin 118, Sacramento Valley Groundwater Basin, North American Subbasin*. January 20, 2006.

[13] San Juan Water District. *2015 Urban Water Management Plan* [pg. 6-3]. June 2016.

construction codes and local ordinances; however, these regulations only apply to residential and non-residential structure improvements. Although roadway construction or modification is not explicitly addressed in the FEMA regulations, the California Department of Transportation (Caltrans) has also adopted criteria and standards for roadway drainage systems and projects situated within designated floodplains. Standards that apply to floodplain issues are based on federal regulations (Title 23, Part 650 of the CFR). At the State level, roadway design must comply with drainage standards included in Chapters 800-890 of the Caltrans Highway Design Manual. CFR Section 60.3(c)(10) restricts cumulative development from increasing the water surface elevation of the base flood by more than one foot within the floodplain.

Federal Clean Water Act

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the federal Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains 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. Section 307 of the CWA describes the factors that EPA must consider in setting effluent limits for priority pollutants.

Nonpoint sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff, but is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such nonpoint sources are generally exempt from federal NPDES permit program requirements. However, two types of nonpoint source discharges are controlled by the NPDES program – nonpoint source discharge caused by general construction activities, and the general quality of stormwater in municipal stormwater systems. The 1987 amendments to the CWA directed the federal EPA to implement the stormwater program in two phases. Phase I addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) municipalities and certain industrial activities. Phase II addresses all other discharges defined by EPA that are not included in Phase I.

Section 402 of the CWA mandates that certain types of construction activities comply with the requirements of the NPDES stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than one acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB), implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs).

As of July 1, 2010, all dischargers with projects that include clearing, grading or stockpiling activities expected to disturb one or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ. The General Permit requires all dischargers, where construction activity disturbs one or more acres, to take the following measures:

1. Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to include a site map(s) of existing and proposed building and roadway footprints, drainage patterns and storm water collection and discharge points, and pre- and post- project topography;
2. Describe types and placement of Best Management Practices (BMPs) in the SWPPP that will be used to protect storm water quality;
3. Provide a visual and chemical (if non-visible pollutants are expected) monitoring program for implementation upon BMP failure; and
4. Provide a sediment monitoring plan if the area discharges directly to a water body listed on the 303(d) list for sediment.

To obtain coverage, a SWPPP must be submitted to the RWQCB electronically and a copy of the SWPPP must be submitted to Placer County. When project construction is completed, the landowner must file a Notice of Termination (NOT).

State Regulations

The following section includes the State regulations relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

State Water Resources Control Board

The SWRCB and the RWQCBs are responsible for ensuring implementation and compliance with the provisions of the federal CWA and California's Porter-Cologne Water Quality Control Act. The project site is situated within the jurisdictional boundaries of the Central Valley RWQCB (CVRWQCB) (Region 5). The CVRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their jurisdiction.

Central Valley Regional Water Quality Control Board

As authorized by the Porter-Cologne Water Quality Control Act, the CVRWQCB primary function is to protect the quality of the waters within its jurisdiction for all beneficial uses. State law defines beneficial uses of California's waters that may be protected against quality degradation to include, but not be limited to: domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

The CVRWQCB implements water quality protection measures by formulating and adopting water quality control plans (referred to as basin plans, as discussed below) for specific groundwater and surface water basins, and by prescribing and enforcing requirements on all agricultural, domestic, and industrial waste discharges. The CVRWQCB oversees many programs to support and provide benefit to water quality, including the following major programs: Agricultural Regulatory; Above-Ground Tanks; Basin Planning; CALFED; Confined Animal Facilities; Landfills and Mining; Non-Point Source; Spills, Leaks, Investigations, and Cleanups (SLIC); Storm Water; Total Maximum Daily Load (TMDL); Underground Storage Tanks (UST), Wastewater Discharges (including the NPDES); Water Quality Certification; and Watershed Management.

The CVRWQCB is responsible for issuing permits for a number of varying activities. Activities subject to the CVRWQCB permitting requirements include stormwater, wastewater, and industrial water discharge, disturbance of wetlands, and dewatering. Permits issued and/or enforced by the CVRWQCB include, but are not limited to, the NPDES Construction General Permit, NPDES Municipal Stormwater Permits, Industrial Stormwater General Permits, Clean Water Act Section 401 and 404 Permits, and Dewatering Permits.

Basin Plans and Water Quality Objectives

The Porter-Cologne Water Quality Control Act provides for the development and periodic review of water quality control plans (basin plans) that are prepared by the regional water quality control boards. Basin plans designate beneficial uses of California's major rivers and groundwater basins, and establish narrative and numerical water quality objectives for those waters. Beneficial uses represent the services and qualities of a water body (i.e., the reasons why the water body is considered valuable), while water quality objectives represent the standards necessary to protect and support those beneficial uses. Basin plans are primarily implemented through the NPDES permitting system and by issuing waste discharge regulations to ensure that water quality objectives are met.

Basin plans provide the technical basis for determining waste discharge requirements and taking regulatory enforcement actions if deemed necessary. The proposed project site is located within the jurisdiction of the CVRWQCB. A basin plan has been adopted for the Sacramento and San Joaquin River Basin (Basin Plan), which covers all of the project area.

The Basin Plan sets water quality objectives for the surface waters in its region for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, radioactivity, salinity, sediment, settleable material, suspended material, taste and odor, temperature, toxicity, turbidity, and pesticides. For groundwater, water quality objectives applicable to all groundwater have been set for bacteria, chemical constituents, radioactivity, taste, odors, and toxicity.

Local Regulations

Relevant goals and policies from the Placer County General Plan and the DCWPCP, as well as various other local guidelines and regulations related to hydrology and water quality, are discussed below.

Placer County General Plan

The following policies from the Placer County General Plan related to hydrology and water quality are applicable to the proposed project:

Goal 4.E	To collect and dispose of stormwater in a manner that least inconveniences the public, reduces potential water-related damage, and enhances the environment.
Policy 4.E.1	The County shall encourage the use of natural stormwater drainage systems to preserve and enhance natural features.

Policy 4.E.2 The County shall support efforts to acquire land or obtain easements for drainage and other public uses of floodplains where it is desirable to maintain drainage channels in a natural state.

Policy 4.E.4 The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County Land Development Manual.

Policy 4.E.8 The County shall consider recreational opportunities and aesthetics in the design of stormwater ponds and conveyance facilities.

Policy 4.E.9 The County shall encourage good soil conservation practices in agricultural and urban areas and carefully examine the impact of proposed urban developments with regard to drainage courses.

Policy 4.E.10 The County shall strive to improve the quality of runoff from urban and suburban development through use of appropriate and feasible mitigation measures including, but not limited to, artificial wetlands, grassy swales, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, and other best management practices (BMPs).

Policy 4.E.11 The County shall require new development to adequately mitigate increases in stormwater peak flows and/or volume. Mitigation measures should take into consideration impacts on adjoining lands in the unincorporated area and on properties in jurisdictions within and immediately adjacent to Placer County.

Policy 4.E.12 The County shall encourage project designs that minimize drainage concentrations and impervious coverage and maintain, to the extent feasible, natural site drainage conditions.

Policy 4.E.13 The County shall require that new development conforms with the applicable programs, policies, recommendations, and plans of the Placer County Flood Control and Water Conservation District.

Policy 4.E.14 The County shall require projects that have significant impacts on the quantity and quality of surface water runoff to allocate land as necessary for the purpose of detaining post-project flows and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.

Policy 4.E.15 The County shall identify and coordinate mitigation measures with responsible agencies for the control of storm sewers, monitoring of discharges, and implementation of measures to control pollutant loads in urban storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Division of Environmental Health, Placer County Department of Public Works, Placer County Flood Control and Water Conservation District).

Goal 4.F To protect the lives and property of the citizens of Placer County from hazards associated with development in floodplains and manage floodplains for their natural resource values.

Policy 4.F.1 The County shall require that arterial roadways and expressways, residences, commercial and industrial uses and emergency facilities be protected, at a minimum, from a 100-year storm event.

Policy 4.F.4 The County shall require evaluation of potential flood hazards prior to approval of development projects. The County shall require proponents of new development to submit accurate topographic and flow characteristics information and depiction of the 100-year floodplain boundaries under fully-developed, unmitigated runoff conditions.

Policy 4.F.5 The County shall attempt to maintain natural conditions within the 100-year floodplain of all rivers and streams except under the following circumstances:

a. Where work is required to manage and maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, California Department of Fish and Game regulations, and Clean Water Act provisions administered by the U.S. Army Corps of Engineers; or
b. When facilities for the treatment of urban runoff can be located in the floodplain, provided that there is no destruction of riparian vegetation.

Goal 6.A To protect and enhance the natural qualities of Placer County's streams, creeks and groundwater.

Policy 6.A.2 The County shall require all development in the 100-year floodplain to comply with the provisions of the *Placer County Flood Damage Prevention Ordinance*.

Policy 6.A.4 Where creek protection is required or proposed, the County should require public and private development to:

a. Preserve creek corridors and creek setback areas through easements or dedication. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a creek is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval;
b. Designate such easement or dedication acres (as described in a. above) as open space;
c. Protect creek corridors and their habitat value by actions such as: 1) providing an adequate creek setback, 2) maintaining creek corridors in an essentially natural state, 3) employing creek restoration techniques

where restoration is needed to achieve a natural creek corridor, 4) utilizing riparian vegetation within creek corridors, and where possible, within creek setback areas, 5) prohibiting the planting of invasive, non-native plants (such as Vinca major and eucalyptus) within creek corridors or creek setbacks, and 6) avoiding tree removal within creek corridors;

d. Provide recreation and public access near creeks consistent with other General Plan policies;
e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas; and/or are stabilized with permanent vegetation that will prevent the transport of sediment off site; and 2) temporary vegetation sufficient to stabilize disturbed areas.
f. Provide for long-term creek corridor maintenance by providing a guaranteed financial commitment to the County which accounts for all anticipated activities.

Policy 6.A.5 The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and urban runoff and to encourage the use of BMPs for agricultural activities.

Policy 6.A.7 The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

Goal 8.B To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards.

DCWPCP

The following goals and policies from the Community Development and Environmental Resources Management Elements of the DCWPCP related to hydrology and water quality are applicable to the proposed project:

Community Development Element: Land Use

Policy 25 Continue to implement zoning policies which minimize potential loss of property and threat to human life caused by flooding and prohibit the creation of new building sites within the floodplain.

Policy 29 Review proposed developments for their potential adverse affect on air and water quality.

Policy 30 Encourage application of measures to mitigate erosion and water pollution from earth disturbing activities such as grading and road construction.

Community Development Element: Public Services

Goal Flood Control: Protect the lives and property of the citizens of the Dry Creek West Placer area from unacceptable impacts from development in the Dry Creek drainage basin or other watershed in the Plan Area.

Policy 2 Evaluate potential flood hazards in an area prior to approval of any future development by requiring submittal of accurate topographic information and depiction of the 100-year floodplain boundaries.

Policy 4 Maintain natural conditions within the 100-year floodplain of all streams except where work is required to maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, Department of Fish and Game regulations and Clean Water Act provisions administered by the U.S. Army Corps of Engineers, or when facilities for the treatment of urban runoff can be located in the floodplain providing that there is no destruction of riparian vegetation.

Policy 5 Designate the 100-year floodplain of Dry Creek, including the major tributaries as open space, and provide for some compatible use of these areas in order to encourage their preservation.

Policy 9 Provide storm drains which can collect water for appropriate conveyance to Dry Creek for developing areas with a higher density than Rural-Residential.

Policy 11 Require a water quality analysis for all projects which have a density in excess of one unit per acre and/or have the potential of contaminating surface waters or the aquifer.

Policy 12 Require a feasibility analysis of improving the water quality of urban run-off for all commercial and industrial projects and those residential projects with densities of 1 d.u./acre or greater before run-off enters the Dry Creek watercourse. Said analysis shall consider all feasible mitigation measures including, but not limited to, artificial wetlands, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, or other effective means, where appropriate.

Policy 13 Require the allocation of land, when necessary, for all projects which have significant impacts on the quantity and quality of surface water runoff, for the

purpose of detaining post project flows and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.

Policy 14 Identify and coordinate mitigation measures with responsible agencies for the control of storm sewers, monitoring of discharges and implementation of measures to control pollutant loads in urban storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Division of Environmental Health, Placer County Department of Public Works, etc.).

Environmental Resources Management: Natural Resources

Goal 3 Manage the groundwater resource in such a way as to protect it from degradation and to maintain the water table.

Goal 4 Safeguard and maintain natural waterways to ensure water quality, species diversity, and unique habitat preservation.

Policy 2 Preserve in their natural condition all stream environment zones, including floodplains, and riparian vegetation areas.

Policy 3 Seek to maintain or improve the quality of water in the major creeks, especially Dry Creek and its tributaries.

Policy 4 Make every attempt to maintain the existing high quality of the groundwater and preserve aquifer recharge areas.

Policy 10 Improve water quality in the aquifer and the Dry Creek watershed by eliminating existing water pollution sources and by discouraging activities which include the use of hazardous materials around wetland and recharge areas.

Policy 25 Intermittent streams often become permanent streams concurrent with the development of an area. Therefore, these waterways shall be protected from land development activities which have a potential for detrimental impacts (e.g., grading, channelization, etc.).

<u>NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit</u>

The NPDES Municipal Stormwater Permitting Program regulates stormwater discharges from separate storm sewer systems. NPDES Municipal Stormwater Permits are issued in two phases. Phase I regulates stormwater discharges from large- and medium-sized municipal separate storm sewer systems (those serving more than 100,000 persons). Most Phase I permits are issued to a group of co-permittees encompassing an entire metropolitan area. Phase II provides coverage for smaller municipalities, including nontraditional small storm sewer systems, which include governmental facilities such as military bases, public campuses, and prison and hospital complexes. The NPDES Municipal Stormwater Permits require the discharger to develop and

implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable.

The CVRWQCB issued the NPDES General Permit No. CAS000004 Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, which became effective on July 1, 2013. An "MS4" is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying stormwater; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW). Projects subject to the requirements of the Phase II MS4 NPDES permit must submit the appropriate Post-Construction Storm Water Plan based on the project type/development category. Regulated Projects include projects that create or replace 5,000 sf or more of impervious surface. Regulated Projects that create and/or replace one or more acres of impervious surface are considered regulated hydromodification management projects. The proposed project would create more than one acre of impervious area, and, thus, is considered a Regulated Hydromodification Management Project subject to Phase II MS4 NPDES permit post-construction stormwater treatment requirements.

Regulated Projects are required to divide the project area into Drainage Management Areas (DMAs) and implement and direct water to appropriately-sized Site Design Measures (SDMs) and Baseline Hydromodification Measures to each DMA to the Maximum Extent Practicable (MEP). Regulated Projects must additionally include Source Control Best Management Practices (BMPs) where possible. SDMs and Baseline Hydromodification Measures include, but are not limited to:

- Rooftop and impervious area disconnection;
- Porous pavement;
- Rain barrels and cisterns;
- Vegetated swales;
- Bio-retention facilities;
- Green roofs; or
- Other equivalent measures, as proposed by the County.

A detailed description of the requirements for Regulated Hydromodification Management Projects, such as the proposed project, is included in the *West Placer Storm Water Quality Design Manual.*[14]

Placer County Flood Control and Water Conservation District

Formed by SB 1312, the Placer County Flood Control and Water Conservation District (PCFCWCD) is responsible for regional strategies for flood control management. A Stormwater Management Manual (SWMM) was developed by the PCFCWCD to relate the policies, guidelines, and specific criteria for evaluating hydrologic conditions associated with new development projects. In 2011, the PCFCWCD published the *Update to the Dry Creek Watershed*

[14] Placer County, City of Roseville, City of Lincoln, City of Auburn, Town of Loomis. *West Placer Storm Water Quality Design Manual.* April 2016.

Flood Control Plan, which identifies potential flooding issues associated with the Dry Creek Watershed and provides recommendations for feasible means to reduce future flood damages.[15]

Placer County Land Development Manual

Section 5 of the Placer County Land Development Manual (1996) provides supplemental design considerations for drainage facilities, and includes specific criteria used for preparation of drainage reports identical to those in the SWMM (as described above under Placer County Flood Control and Water Conservation District). The Land Development Manual states that in case of conflict with the SWMM, the most stringent requirement shall apply. The Land Development Manual also contains general information with regard to erosion control and BMPs for stormwater drainage.

Placer County Code

Chapter 15, Building and Development, of the Placer County Code includes ordinances associated with hydrology and water quality. The applicable ordinances are discussed in further detail below.

Stormwater Quality Ordinance

Article 8.28, Stormwater Quality Ordinance, is intended to ensure that Placer County is compliant with State and federal laws related to stormwater quality by enhancing and protecting the quality of waters of the State in Placer County through reducing pollutants in stormwater discharges to the maximum extent practicable and controlling non-stormwater discharges to the storm drain system. The Stormwater Quality Ordinance requires the use of BMPs to reduce adverse effects of polluted runoff discharges on waters of the State, and prohibits illicit discharges to the storm drain system. The Stormwater Quality Ordinance establishes the County's authority to adopt requirements for stormwater management, including source control requirements, to reduce pollution to the maximum extent practicable; requirements for development projects to reduce stormwater pollution and erosion both during construction and after the project is complete; and enable the County to implement and enforce any stormwater management plan adopted by the County.

Grading, Erosion and Sediment Control Ordinance

Article 15.48, Grading, Erosion and Sediment Control Ordinance, of the Placer County Code regulates grading on property within the unincorporated area of Placer County in order to safeguard life, limb, health, property and public welfare; to avoid pollution of watercourses with hazardous materials, nutrients, sediments, or other earthen materials generated on or caused by surface runoff on or across the permit area; and to ensure that the intended use of a graded site is consistent with the Placer County General Plan, any specific plans adopted thereto and applicable Placer County ordinances including the Zoning Ordinance, Flood Damage Prevention Ordinance (Article 15.52 of the Placer County Code), Environmental Review Ordinance (Chapter 18 of the Placer County Code), and applicable chapters of the California Building Code. In the event of

[15] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan.* November 2011.

conflict between applicable chapters and Article 15.48, the most restrictive shall prevail. Part 6 of Article 15.48 sets forth design standards for grading activities such as excavation, slopes, fill soil, setbacks, and drainage.

Dry Creek Watershed Drainage Improvement Zone Ordinance

The Dry Creek Watershed Drainage Improvement Zone Ordinance (Article 15.32 of the Placer County Code) establishes a drainage improvement zone for the Dry Creek watershed. In addition, the Ordinance requires the payment of specified fees and annual assessments as a condition of new development within the watershed area; such fees and assessments are used for the installation and maintenance of roadway drainage and stormwater drainage improvements. Mitigation fees are required for new development, and the expansion of existing development, within portions of the Dry Creek watershed that impose a burden on the creeks and drainage infrastructure within the watershed by adding additional impervious surface and accelerating runoff, thereby increasing discharge rates.

Flood Damage Prevention Ordinance

Article 15.52, Flood Damage Prevention Ordinance, is intended to minimize public and private losses due to flood conditions in specific areas by provisions designed to protect human life and health; minimize the need for rescue and relief efforts associated with flooding; minimize prolonged business interruptions; minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard; provide for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas; ensure that potential buyers are notified that property is in an area of special flood hazard; and ensure that those who occupy areas of special flood hazard assume responsibility for their actions. The Flood Damage Prevention Ordinance provides methods for reducing flood losses, and sets forth standards for construction in all areas of special flood hazards.

10.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology used to analyze and determine the proposed project's potential impacts related to hydrology and water quality. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented. The discussions and mitigation measures presented below apply to all of the properties included in the project site, as well as any off-site improvement areas, unless otherwise stated.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines and the Placer County General Plan, a significant impact would occur if the proposed project would result in any of the following:

- Violate any federal, state or county potable water quality standards;
- Substantially deplete groundwater supplies or interfere substantially with groundwater

recharge such that there would be a net deficit in aquifer volume or a lessening of local groundwater supplies (i.e. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area;
- Increase the rate or amount of surface runoff;
- Create or contribute runoff water which would include substantial additional sources of polluted water;
- Otherwise substantially degrade surface water quality;
- Otherwise substantially degrade ground water quality;
- Place 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;
- Place within a 100-year flood hazard area improvements which would impede or redirect flood flows;
- Expose 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;
- Alter the direction or rate of flow of groundwater; or
- Impact the watershed of important surface water resources, including but not limited to Lake Tahoe, Folsom Lake, Hell Hole Reservoir, Rock Creek Reservoir, Sugar Pine Reservoir, French Meadows Reservoir, Combie Lake, and Rollins Lake.

The proposed project's impacts associated with water supplies (including groundwater supplies) are discussed in Chapter 16, Utilities and Service Systems, of this EIR.

Method of Analysis

The impacts analysis for this chapter is based primarily on the Preliminary Hydrologic and Hydraulic Study and the SWQP prepared for the proposed project by TSD Engineering, Inc, as well as the supplemental Hydrologic Impact Analysis prepared for the project by Michael S. Thomas, P.E. Determinations of significance were made based on comparison of the existing conditions quantified above with the modeled post-project conditions.

Preliminary Hydrologic and Hydraulic Study Methodology

The methodology contained in the Preliminary Hydrologic and Hydraulic Study is in compliance with the procedures presented in the PCFCWCD Stormwater Management Manual. Hydrologic analysis was completed to estimate storm runoff from the proposed project. The drainage basins and flow patterns for the developed and undeveloped conditions were determined from existing topography and the proposed grading plans. The Stormwater Management Manual was consulted to determine both the 10-year storm (for analysis of the onsite storm drain system) and 100-year storm (for analysis of the overland flow routes). An infiltration rate of 0.12 inches per hour for hydrologic group D soils in residential areas was used for the runoff calculations. StormCAD software was used in the analysis of the proposed pipe storm drain system.

Appendix F of the Preliminary Hydrologic and Hydraulic Study (Appendix I to this EIR) includes an analysis of buildout flows in project area tributaries assuming buildout of the DCWPCP, including the proposed project. The goal of the analysis was to define the limits of the 100-year floodplain. As noted previously, FEMA has not fully mapped the 100-year floodplain within the project site.

The hydrologic response of the project watershed was evaluated using the USACE Hydrologic Engineering Center (HEC) Hydrologic Modeling System (HMS) computer program. Hydrologic parameters used in the HEC-HMS computer model generally include the following:

- Meteorological data (precipitation data);
- Watershed sub-basin data (area, infiltration losses, percent impervious, kinematic wave overland flow length, and slope and roughness); and
- Reach routing data (runoff collector length, slope, roughness, and channel type and geometry).

Key hydrologic parameters for the watershed sub-basins and reach routing segments were extracted from the 2011 *Update to the Dry Creek Watershed Flood Control Plan*.[16] The HEC-HMS computer modeling program was used to estimating runoff rates entering and flowing through the project site toward Dry Creek. Runoff estimates for the "full build-out" land use condition were developed using sub-basin characteristics presented in the *Update to the Dry Creek Watershed Flood Control Plan*, including initial precipitation losses of 0.1 inches and constant infiltration losses ranging from 0.07 to 0.19. Design storm precipitation data was developed using the procedures and guidance provided in the Placer County Stormwater Management Manual. The resulting precipitation amount and duration data used in the HEC-HMS model represents a balanced design storm with a duration of 10 days for a site with an average elevation of 120 feet and storm frequencies of 2-, 10-, 25-, 100-, and 200-years.

The USACE HEC River Analysis System (HEC-RAS) computer model was used to analyze the water surface profiles. The starting water surface elevation for the 100-year and 10-year downstream water boundary condition was derived from FEMA FIRM data. Roughness (Manning's n) values were based on the Stormwater Management Manual and are 0.065 for the channel along the eastern portion of the project site and 0.08 for the floodplain. Aerial topography for the project site was provided by TSD Engineering, Inc. HEC-RAS cross-section data was developed using a topographic survey. The bridge at PFE Road was modeled as a box culvert with a clear span of 14.5-feet and a height of 7.5 feet. Modeled flow rates and profile water surface elevations for 2-, 10-, 25-, and 100-year storm events at the eastern portion of the project site are included as an attachment to the report.

Supplemental Hydrologic Impact Analysis Methodology

The Hydrologic Impact Assessment analyzed the following three project site conditions:

[16] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan.* November 2011.

- Condition 1: The existing site condition reflecting rural residential and open space land use designations with imperviousness factors of 15-percent and 2-percent, and constant infiltration losses of 0.07- and 0.16-inches per hour, respectively.
- Condition 2. The land use designations anticipated per the DCWPCP reflecting industrial and commercial uses with imperviousness factors of 80-percent and constant infiltration losses of 0.07-, and 0.12-inches per hour, respectively; Low Density Residential (LDR) with 25-percent imperviousness and infiltration of 0.12-inches per hour; and Greenbelt and Open Space (O) with two-percent imperviousness and infiltration of 0.16 inches per hour, corresponding to Type B soils along the existing riparian corridor.
- Condition 3: Proposed land use of Medium Density Residential (MDR) having imperviousness of 50 percent and open space imperviousness of 2-percent. A constant rate infiltration of 0.12-inches per hour was used for MDR and for open space, either 0.07-inches per hour or 0.16-inches per hour depending upon the underlying soil type (Type D or Type B).

Using the basic hydrologic characteristics that currently drive the generation of runoff from the project site, Conditions 1, 2, and 3 and the respective percent impervious surface, infiltrative capacity of site soils, and cumulative site infiltration capacity were compared.

To estimate and compare runoff rates and volumes emanating from the project site under Conditions 1, 2 and 3, the USACE HEC-HMS computer model was used to generate runoff hydrographs. One additional model scenario was developed to estimate the effect of the proposed project's LID components on runoff rate and volume.

Modeling Approach

With implementation of the proposed project, runoff from Shed A would be conveyed by the proposed street and storm drain system and would discharge into a natural drainage channel on the north side of PFE Road that flows to Dry Creek. Runoff from Shed B would be collected by a new storm drain system that would convey flows across Antelope Road, through Shed C, and discharge into the existing riparian corridor within Shed C. Runoff from Shed C would similarly be collected by storm drains and conveyed to and discharge into the riparian corridor. DCWPCP drainage patterns were assumed to be similar to drainage occurring with implementation of the project, with the exception of shed divides where the DCWPCP shed boundaries conform with existing conditions.

Preliminary Post-Construction SWQP

The SWQP prepared for the proposed project was based on the requirements of the West Placer Storm Water Quality Design Manual and the State's Phase II Small MS4 General Permit. Data used to complete the SWQP was sourced from the Preliminary Hydrologic and Hydraulic Study, as well as applicant-provided information.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

10-1 Violate any federal, State, or County potable water quality standards, create or contribute runoff water which would include substantial additional sources of polluted water, or otherwise substantially degrade surface or ground water quality during construction. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

Construction would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. All such activities have the potential to affect water quality and contribute to localized violations of water quality standards if stormwater runoff from construction activities enters receiving waters.

Construction activities such as grading, excavation, and trenching for site improvements would result in the disturbance of on-site soils. The exposed soils have the potential to affect water quality in two ways: 1) suspended soil particles and sediments transported through runoff; or 2) sediments transported as dust that eventually reach local water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites also have the potential to enter runoff. Typical pollutants include, but are not limited to, petroleum and heavy metals from equipment and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment or contaminants should enter receiving waters in sufficient quantities. Impacts from construction-related activities would generally be short-term and of limited duration.

Because the proposed project would require construction activities that would result in a land disturbance greater than one acre, the project applicant would be required by the State to comply with the most current Construction General Permit requirements. Per the requirements, a SWPPP would be prepared for the overall project, which would include the site map, drainage patterns and stormwater collection and discharge points, BMPs, and a monitoring and reporting framework for implementation of BMPs, as necessary.

Consistent with State guidelines, Articles 8.28 and 15.48 of the Placer County Code, and Policy 6.A.5 of the Placer County General Plan, BMPs that must be implemented include erosion and sediment control BMPs and non-stormwater management and materials management BMPs. Erosion controls include practices to stabilize soil, to protect the soil in its existing location, and to prevent soil particles from migrating. Examples of erosion control BMPs include preserving existing vegetation, mulching, and hydroseeding. Sediment controls include practices to collect soil particles after they have migrated, but before the sediment leaves the site. Examples of sediment control BMPs include street sweeping, fiber rolls, silt fencing, gravel bags, sand bags, storm drain inlet protection, sediment traps, and detention basins. Wind erosion controls prevent soil particles from

leaving the site in the air. Examples of wind erosion control BMPs include applying water or other dust suppressants to exposed soils on the site. Tracking controls prevent sediment from being tracked off-site via vehicles leaving the site to the extent practicable. Tracking controls could include a stabilized construction entrance, which would not only limit the access points to the construction site, but also function to partially remove sediment from vehicles prior to leaving the site.

Non-stormwater management and material management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The General Permit prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges (such as irrigation and pipe flushing and testing). Non-stormwater BMPs tend to be management practices with the purpose of preventing stormwater from coming into contact with potential pollutants. Examples of non-stormwater BMPs include preventing illicit discharges, and implementing good practices for vehicle and equipment maintenance, cleaning, and fueling operations, such as using drip pans under vehicles. Waste and materials management BMPs include implementing practices and procedures to prevent pollution from materials used on construction sites. Examples of materials management BMPs include the following:

- Good housekeeping activities such as storing of materials covered and elevated off the ground, in a central location;
- Securely locating portable toilets away from the storm drainage system and performing routine maintenance;
- Providing a central location for concrete washout and performing routine maintenance;
- Providing several dumpsters and trash cans throughout the construction site for litter/floatable management; and
- Covering and/or containing stockpiled materials and overall good housekeeping on the site.

As discussed in Chapter 8, Geology and Soils/Mineral Resources, of this EIR, the project would be subject to NPDES Construction General Permit requirements, including implementation of BMPs and preparation of a site-specific SWPPP. In addition, a Notice of Intent (NOI) would be filed with RWQCB. The General Permit also requires that construction sites be inspected before and after storm events and every 24 hours during extended storm events. The purpose of the inspections is to identify maintenance requirements for the BMPs and to determine the effectiveness of the BMPs that are being implemented. The SWPPP is considered a "living document" that could be modified as construction activities progress. A Qualified SWPPP Practitioner (QSP) would ensure compliance with the SWPPP through regular monitoring and visual inspections during construction activities. The SWPPP would be amended and BMPs revised, as determined necessary through field inspections, to protect against substantial erosion or siltation on- or off-site.

It should be noted that prior to construction, all on-site contaminants detected above regional screening levels, including pesticides detected within the Haigh property, would be remediated. The bulk fertilizer tank located on the Haight property would be removed. Thus, such contaminants would not degrade water quality during construction activities associated with the proposed project. The required construction water quality BMPs would adequately treat any other contaminants detected below regional screening levels.

Compliance with the State NPDES Construction General Permit and Article 8.28 and 15.48 of the Placer County Code, as described above and required by Mitigation Measures 8-2(b), 8-4(a), and 8-4(b), would minimize the potential degradation of stormwater quality and downstream surface water associated with construction of the proposed project. In addition, BMPs would be required to be designed in accordance with the California Stormwater Quality Association Stormwater Best Management Practice Handbooks for Construction and for New Development/Redevelopment (or other similar source as approved by the Engineering and Surveying Division). Therefore, with implementation of the following mitigation measures, the proposed project would avoid a ***significant*** impact related to short-term construction-related water quality.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-1(a) *Implement Mitigation Measures 8-2(b), 8-4(a), and 8-4(b).*

10-1(b) *The Improvement Plans shall show that water quality treatment facilities/Best Management Practices (BMPs) shall be designed according to the guidance of the California Stormwater Quality Association Stormwater Best Management Practice Handbooks for Construction, for New Development/Redevelopment, and for Industrial and Commercial (or other similar source as approved by the Engineering and Surveying Division [ESD]).*

Storm drainage from on- and off-site impervious surfaces (including roads) shall be collected and routed through specially designed catch basins, vegetated swales, vaults, infiltration basins, water quality basins, filters, etc. for entrapment of sediment, debris and oils/greases or other identified pollutants, as approved by the ESD. BMPs shall be designed in accordance with the West Placer Storm Water Quality Design Manual for Sizing of Permanent Post-Construction Best Management Practices for Stormwater Quality Protection. Water quality facility construction shall not be permitted within any identified wetlands area, floodplain, or right-of-way, except as authorized by project approvals.

All permanent BMPs shall be maintained as required to ensure effectiveness. The applicant shall provide for the establishment of vegetation, where specified, by means of proper irrigation. Proof of on-

going maintenance, such as contractual evidence, shall be provided to ESD upon request. The project owners/permittees shall provide maintenance of these facilities and annually report a certification of completed maintenance to the County DPWF Stormwater Coordinator unless, and until, a County Service Area is created and said facilities are accepted by the County for maintenance. Prior to Improvement Plan or Final Subdivision Map approval, easements shall be created and offered for dedication to the County for maintenance and access to these facilities in anticipation of possible County maintenance.

10-2 Violate any federal, State, or County potable water quality standards, create or contribute runoff water which would include substantial additional sources of polluted water, or otherwise substantially degrade surface or ground water quality during operations. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

Development of the proposed project would result in the conversion of a rural area to single-family residential uses and associated amenities, such as parks and landscaping. Such new land uses could result in new stormwater pollutants being introduced to the project area. Pollutants associated with the operational phase of the proposed project could include nutrients, oil and grease, metals, organics, pesticides, bacteria, sediment, trash, and other debris. Nutrients that could be present in post-construction stormwater include nitrogen and phosphorous resulting from fertilizers applied to landscaping. Excess nutrients could affect water quality by promoting excessive and/or a rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Pesticides, which are toxic to aquatic organisms and can bioaccumulate in larger species, such as birds and fish, can potentially enter stormwater after application to landscaped areas within the project site. Oil and grease could enter stormwater from vehicle leaks, traffic, and maintenance activities. Metals could enter stormwater as surfaces corrode, decay, or leach. Clippings associated with landscape maintenance and street litter could be carried into storm drainage systems. Pathogens (from sanitary sewer overflows, spills and leaks from portable toilets, pets, wildlife, and human activities) have the potential to affect downstream water quality. Furthermore, urban development results in increased impervious surfaces, which may increase the rate and volume of runoff and could result in erosion and siltation impacts.

Development of the proposed project could also increase polluted non-stormwater runoff (e.g., car wash water, other wash water, and landscape irrigation runoff). Such non-stormwater runoff could flow down sidewalks, parking areas, and streets, and pick up additional pollutants deposited on impervious surfaces prior to discharge into the storm drain system and surface waters.

Phase II MS4 Permit Requirements

As discussed previously, the proposed project is located within the permit area covered by Placer County's MS4 Permit (NPDES General Permit No. CAS000004, Order No. 2013-

0001-DWQ), pursuant to the NPDES Phase II program. Project-related stormwater discharges are subject to all applicable requirements of said permit. Specifically, as noted above, regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately-sized SDMs and Baseline Hydromodification Measures to each DMA. Source control measures must be designed for pollutant generating activities or sources consistent with recommendations from the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on the Improvement Plans. Additional details related to hydromodification management requirements associated with the Phase II MS4 permit are discussed under Impact 10-3 below. In addition, hydromodification management projects, such as the proposed project, are typically required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2-year, 24-hour storm event, generally by way of infiltration, rooftop, and impervious area disconnection, bio-retention, or other LID measures that result in post-project flows that mimic pre-project conditions.

Proposed Storm Drain System

Per the SWQP and the Preliminary Hydrologic and Hydraulic Study, the proposed project would include an on-site storm drain system composed of the following LID components: permeable pavement and bio-retention basins. Consistent with MS4 permit requirements, the proposed project site would be divided into 31 DMAs.

Runoff from on-site impervious areas within DMAs 29 and 30-31 would drain to gutters along the internal street system. The gutters throughout the site would incorporate permeable pavement, which would allow stormwater to percolate through the pavement and underlying bedding material and infiltrate the uncompacted subgrade soil. Excess runoff from the permeable pavement areas would drain to a series of proposed underground drains. DMAs 1 through 28 would drain to bio-retention basins located at each intersection within the project site, as well as at specific points along the right-of-ways of the internal streets. The bio-retention basins would be composed of approximately 18 inches of soil mix underlain with three inches of washed pea gravel and 12 inches minimum of washed drain rock. Each basin would include an inlet with a grated top to allow excess runoff to drain to new 10-inch storm drains. The runoff entering the 10-inch storm drains would be routed to larger 48-inch storm drains within the street rights-of-way.

The proposed permeable pavement areas and bio-retention basins would be sized to treat the first flush, which includes a majority of the larger pollutants (sand, soil, silt, grease and trash) as well as smaller pollutants (sediment, nutrient, metals, pesticides and organics). Thus, project runoff entering Dry Creek would be properly treated, and would not pollute downstream waterways.

Maintenance and Inspection

In order to ensure that the proposed bio-retention basins and permeable pavement areas continue to adequately treat runoff throughout the lifetime of the project, the SWQP includes site-specific inspection and maintenance procedures to be implemented by the project applicant. For example, plants and vegetation within the bio-retention basins would be inspected monthly, and the basins would be inspected for the presence of standing water 72 hours after rain events.

Required maintenance activity would include, but not necessarily be limited to, removal of debris from bio-retention basins, removal of debris from outlets of bio-retention basins and permeable pavement areas, and surface cleaning of permeable pavement areas using a vacuum sweeper and a power washer. Implementation of the inspection and maintenance procedures for the bio-retention basins and permeable pavement would ensure that the polluted runoff would not enter downstream water bodies during the continued operation of the project.

Source Control Measures

The SWQP details specific source control measures to be implemented for each potential pollutant-generating activity or source present on the proposed project site. The source control measures include, but are not limited to, measures related to proper storage of all project materials, use of environmentally-friendly materials for indoor and structural pest control, and compliance with manufacturer recommendations and regulations related to pesticide use. As noted in the SWQP, the source control measures would be designed consistent with the recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or from another equivalent manual.

Conclusion

Based on the above, the proposed project would properly treat stormwater runoff prior to discharge from the site. Thus, urban pollutants entering and potentially degrading the local water quality would not be expected to occur as a result of the project. A final drainage report would be required with submittal of the Improvement Plans for County review and approval to substantiate the preliminary report drainage and BMP sizing calculations. However, should the project applicant fail to comply with such requirements, the proposed project could result in a ***significant*** impact related to violating federal, State, or County potable water quality standards, creating or contributing runoff water which would include substantial additional sources of polluted water, or otherwise substantially degrading surface or ground water quality during operations.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-2(a) Implement Mitigation Measure 10-1(b).

10-2(b) *The Improvement Plans shall include the message details, placement, and locations showing that all storm drain inlets and catch basins within the project area shall be permanently marked/embossed with prohibitive language such as "No Dumping! Flows to Creek." or other language and/or graphical icons to discourage illegal dumping as approved by the Engineering and Surveying Division (ESD). ESD-approved signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, shall be posted at public access points along channels and creeks within the project area. The Property Owners' association is responsible for maintaining the legibility of stamped messages and signs.*

10-2(c) *This project is located within the permit area covered by Placer County's Small Municipal Separate Storm Sewer System (MS4) Permit (State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, Order No. 2013-0001-DWQ), pursuant to the NPDES Phase II program. Project-related stormwater discharges are subject to all applicable requirements of said permit.*

The project shall implement permanent and operational source control measures as applicable. Source control measures shall be designed for pollutant generating activities or sources consistent with recommendations from the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and shall be shown on the Improvement Plans.

The project is also required to implement Low Impact Development (LID) standards designed to reduce runoff, treat stormwater, and provide baseline hydromodification management to the extent feasible, as determined by ESD.

10-2(d) *Per the State of California NPDES Phase II MS4 Permit, this project is a Regulated Project that creates and/or replaces 5,000 square feet or more of impervious surface. A final Storm Water Quality Plan (SWQP) shall be submitted, either within the final Drainage Report or as a separate document that identifies how this project will meet the Phase II MS4 permit obligations. Site design measures, source control measures, and Low Impact Development (LID) standards, as necessary, shall be incorporated into the design and shown on the Improvement Plans. In addition, per the Phase II MS4 permit, projects creating and/or replacing one acre or more of impervious surface are also required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2 year, 24-hour storm event, generally by way of infiltration, rooftop and impervious area disconnection, bioretention, and other LID measures that result in post-project flows that mimic pre-project conditions.*

10-3 Substantially alter the existing drainage pattern of the site or area, or increase the rate or amount of surface runoff. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

The proposed project site currently contains large areas where minimal development has occurred, and, thus limited impervious area exists on the site. As noted in the Preliminary Hydrologic and Hydraulic Study prepared for the proposed project, approximately 80 percent of the site would consist of impervious areas following complete buildout of all project phases. Perimeter roadways, including PFE Road and Antelope Road, would be widened as part of the proposed project per County traffic circulation requirements (see Chapter 3, Project Description, of this EIR). Due to the increase in impervious surfaces on the site, the proposed project has the potential to substantially alter the drainage pattern of the site and increase runoff water.

Peak Flows and Volumes

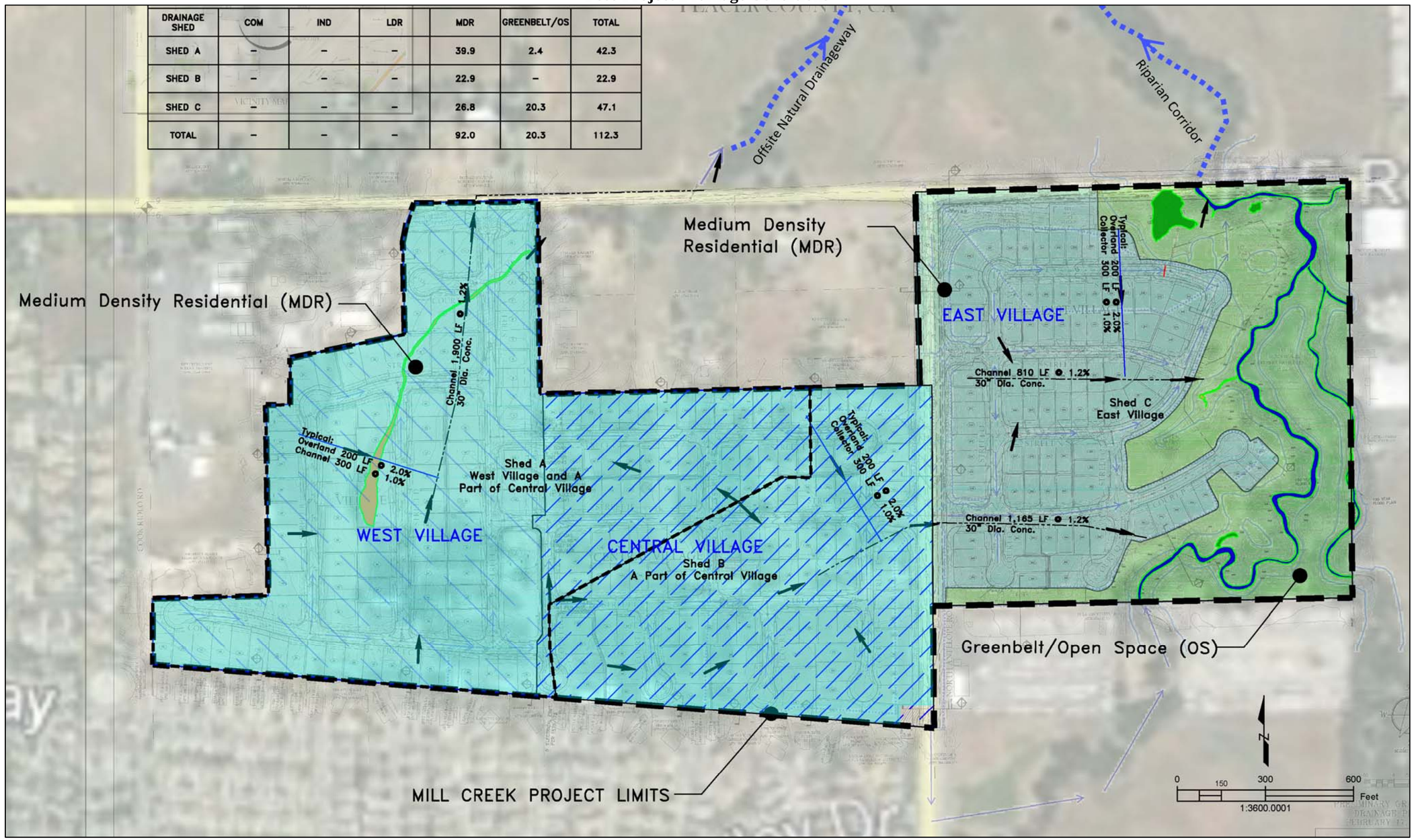
Based on the proposed grading of the project site, which conforms closely to existing topographical conditions, the site contains three basic drainage areas. The three areas are referred to as Shed A, Shed B, and Shed C, relating to the West Village, the Central Village, and the East Village, respectively. Because of the existing grade breaks, Shed A encompasses all the West Village and a portion of the Central Village. Shed B encompasses the balance of the Central Village and Shed C encompasses all of the East Village. With the development of the proposed project, runoff from Shed A would discharge from the proposed on-site storm drainage system into a natural drainage channel on the north side of PFE Road that flows to Dry Creek. Storm flows would be conveyed eastward through a proposed underground storm pipe along PFE Road for approximately 700 feet, at which point the pipe would cross PFE Road and discharge to Dry Creek north of the roadway.

Runoff from Shed B would be conveyed by the proposed drainage system across Antelope Road and through Shed C prior to discharging into the Dry Creek tributaries within Shed C. Runoff from Shed C would similarly be collected by storm drains and discharged into the tributaries at two outfall locations, both of which are located south of PFE Road. One of the outfalls would discharge in to the Lot K Park, and the other would discharge to the north of the Lot Q park, in an open space area. Figure 10-3 provides an overview of the drainage conditions expected to occur with development of the project.

Table 10-2 below presents a comparison of the peak discharge rates associated with the following conditions:

- Existing site drainage conditions;
- Buildout of the project site per current DCWPCP land use designations; and
- Buildout of the project site with the proposed project.

Figure 10-3
Post-Project Drainage Conditions



Source: Michael S. Thomas, P.E., 2017.

Table 10-2
Peak Flow Characteristics – Existing, DCWPCP Buildout, and Proposed Project

Drainage Shed	Existing Conditions		Buildout Per Existing DCWPCP Land Use Designations		Proposed Project with LID	
	Peak Runoff (cfs)	Volume (inches)	Peak Runoff (cfs)	Volume (inches)	Peak Runoff (cfs)	Volume (inches)
2-Year Return Frequency Storm						
A[1]	10.8	1.38	22.7	2.20	15.4	2.70
B[2]	8.5	1.33	12.7	3.49	9	2.56
C[3]	16.6	0.63	26.8	3.38	16.2	2.40
Total:	**35.9**	**3.34**	**62.2**	**9.07**	**40.6**	**7.66**
10-Year Return Frequency Storm						
A[1]	41.7	2.56	52.1	3.67	45.7	4.62
B[2]	18.6	2.48	27.2	5.68	15.7	4.14
C[3]	38.8	1.38	58.0	5.48	45.6	4.09
Total:	**99.1**	**6.42**	**137.3**	**14.83**	**107**	**12.85**
25-Year Return Frequency Storm						
A[1]	57.2	3.21	70.6	4.52	66.5	5.68
B[2]	25.3	3.13	36.6	6.88	20.4	5.12
C[3]	53.5	1.85	78.2	6.66	69.4	5.06
Total:	**136**	**8.19**	**185.4**	**18.06**	**156.3**	**15.86**
100-Year Return Frequency Storm						
A[1]	81.6	4.44	101.4	6.00	93.6	7.52
B[2]	36.4	4.35	52.0	8.91	35.9	6.85
C[3]	77.6	2.62	114.5	8.62	112.1[4]	6.72
Total:	**195.6**	**11.41**	**267.9**	**23.53**	**241.64**	**21.09**

Notes:
1 Shed A area is 43.5-acres for existing and DCWPCP buildout conditions and 42.3 acres for the proposed project.
2 Shed B area is 21.7-acres for existing and DCWPCP buildout conditions and 22.9 acres for the proposed project.
3 Shed C area is 41.7-acres for all conditions.
4 The reported higher value results from data interpolation in the stage-discharge-storage table, more refinement of the model resolution would result in a lower value.

Source: Michael S. Thomas, P.E., 2017.

As shown in the table, buildout of the proposed project with the proposed LID features would result in a slight increase in peak runoff during the 2-year, 10-year, 25-year, and 100-year return frequency storm events. However, peak flows occurring under buildout of the proposed project would be considerably less than flows occurring under buildout of the project site per the current DCWPCP land use designations. In some cases, peak flows would be less under buildout of the proposed project compared to existing conditions, although volumes would generally increase for all sheds under the proposed project condition.

The peak runoff rate from the project site would occur approximately 20 to 25 minutes after peak rainfall. When joined with other off-site areas draining to Dry Creek, the peak flow entering Dry Creek would occur approximately 35 minutes after the peak rainfall intensity, or hour 12:35 during the 24-hour design storm. In comparison, peak flows for a 24-hour storm centered on the upper Dry Creek Watershed would require approximately 7.25 hours (hour 19:25) to develop and travel to the reach of Dry Creek within the project vicinity, after peak runoff flows from the project site have already dissipated. Thus, the peak flows from the project site and the upper Dry Creek Watershed would not combine.

Per the County's Phase II MS4 permit, hydromodification management projects, such as the proposed project, are typically required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2-year, 24-hour storm event, generally by way of infiltration, rooftop, and impervious area disconnection, bio-retention, or other LID measures that result in post-project flows that mimic pre-project conditions. However, the Dry Creek Watershed Flood Control Plan notes that the use of local detention basins to limit peak runoff has the potential to result in higher overall peak flows within Dry Creek.[17] Specifically, detaining flows in the lower portion of the Dry Creek Watershed, within which the project site is located, could delay the time when the peak flow occurs such that the peak flow would coincide with the arrival of peak flows from the upper portion of the watershed. Thus, the proposed project would not include detention of on-site stormwater runoff.

Nonetheless, the proposed project would be required to comply with Placer County's Dry Creek Watershed Drainage Improvement Ordinance, which requires new development that increases impervious surface areas within the Dry Creek watershed to pay fees to fund future drainage improvement projects within the watershed. The fees include a one-time fee that is paid prior to start of construction and an annual fee that is included in the parcel's property tax. Both fees are based on the amount of impervious area created by the proposed development.

Downstream Conveyance Capacity

As noted previously, stormwater flows would leave the site by way of the Dry Creek tributaries located on the eastern portion of the project site, as well as the existing natural

[17] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. 66]. November 2011.

drainage located to the north of the 25-acre Pruett property, across PFE Road. The ability of the drainage channels to accommodate project runoff is discussed below.

Dry Creek Tributaries

Appendix F of the Preliminary Hydrologic and Hydraulic Study (Appendix I to this EIR) tiers off of the 2011 *Update to the Dry Creek Watershed Flood Control Plan*, and includes an analysis of the conveyance capacity of the Dry Creek tributaries located on the eastern portion of the proposed project site. The associated modeling accounted for existing runoff within the drainage shed, as well as runoff occurring under buildout of the proposed project site. In addition, the modeling accounted for buildout of currently undeveloped areas within the drainage shed per the current DCWPCP land use designations for such areas. As such, the analysis is cumulative in nature. Based on the results of the analysis, the Dry Creek tributaries would be capable of handling peak flows occurring during the 2-year, 10-year, 25-year, and 100-year storm events, with the 100-year event causing some flooding in the open space areas of the proposed East Village area. As discussed in Impact 10-4, all of the proposed homes would be located outside of the 100-year floodplain.

Northern Drainage Channel

Per the Hydrologic Impact Analysis prepared by Michael S. Thomas, P.E., the natural drainage on the north side of PFE Road currently receives flows from the project site and from approximately 40.6 acres of adjacent off-site areas. The planned land uses for the off-site area consist of a mixture of high and low density residential, similar to the land uses proposed for the project site. Assuming development of the off-site areas occurs in a manner similar to the proposed project, the off-site flow contribution is estimated to be approximately 110 cfs. With cumulative build-out of the off-site areas and the proposed project, a peak flow of approximately 220 cfs would flow through the natural drainageway during the 100-year storm event. Based on the results of the Hydrologic Impact Analysis, which evaluated the characteristics of the channel (e.g., width, side slopes, etc.), the northern drainage channel would be capable of handling peak flows occurring during the 2-year, 10-year, 25-year, and 100-year storm events under cumulative conditions.[18]

Conclusion

Based on the above, the proposed project would result in a relatively minor increase in peak runoff relative to existing conditions, albeit considerably less than flows that could occur under buildout of the project site per the current DCWPCP land use designations. The project applicant would be required to pay fees in accordance with the Dry Creek Watershed Drainage Improvement Ordinance. Payment of such fees would help to fund future drainage facility improvement projects within the Dry Creek watershed. Nevertheless, the proposed project could result in a ***significant*** impact related to

[18] Michael S. Thomas, P.E. *Mill Creek Subdivision, Hydrologic Impact Analyses and Response to the EIR Consultant Questions* [pg. 8]. November 13, 2017.

substantially altering the drainage pattern of the site or area, or increasing the rate or amount of surface runoff.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-3(a) *As part of the Improvement Plan submittal process, the preliminary Drainage Report provided during environmental review shall be submitted in final format. The final Drainage Report may require more detail than that provided in the preliminary report, and will be reviewed in concert with the Improvement Plans to confirm conformity between the two. The report shall be prepared by a Registered Civil Engineer and shall, at a minimum, include: A written text addressing existing conditions, the effects of the proposed improvements, all appropriate calculations, watershed maps, changes in flows and patterns, and proposed on- and off-site improvements and drainage easements to accommodate flows from this project. The report shall identify water quality protection features and methods to be used during construction, as well as long-term post-construction water quality measures. The final Drainage Report shall be prepared in conformance with the requirements of Section 5 of the Land Development Manual and the Placer County Storm Water Management Manual that are in effect at the time of improvement plan submittal.*

10-3(b) *This project is subject to the one-time payment of drainage improvement and flood control fees pursuant to the "Dry Creek Watershed Interim Drainage Improvement Ordinance" (Ref. Article 15.32, Placer County Code). The current estimated development fees are: a one-time fee of $224 per residence, payable to the Engineering and Surveying Division prior to Building Permit issuance. The actual fee shall be that in effect at the time payment occurs.*

10-3(c) *This project is subject to payment of annual drainage improvement and flood control fees pursuant to the "Dry Creek Watershed Interim Drainage Improvement Ordinance" (Ref. Chapter 15, Article 15.32, Placer County Code). Prior to Building Permit issuance, the applicant shall cause the subject property to become a participant in the existing Dry Creek Watershed County Service Area for purposes of collecting such annual assessments. The current estimated annual fee is $35 per residence.*

10-4 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or flood hazard delineation map, place within a 100-year floodplain structures which would impede or redirect flood flows, or expose 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. Based on the analysis below, the impact is *less than significant*.

As discussed above, FEMA has not studied the entire Placer Greens property. In order to determine flood hazards associated with the riparian corridor, the hydrology analysis performed by Michael S. Thomas included modeling of the 100-year flood event within the project area (see Figure 10-2). As shown in the figure, only the extreme northeast portion of the site lies within the 100-year floodplain. Development of the proposed single-family residences would occur outside of the 100-year floodplain. Construction within the floodplain would be limited to parks and recreational trails.

All of the proposed improvements would be subject to Article 15.52, Flood Damage Prevention Ordinance, of the Placer County Code, which is intended to minimize public and private losses due to flood conditions, including where public facilities and utilities are located within areas of special flood hazard. The Flood Damage Prevention Ordinance provides methods for reducing flood losses, and sets forth standards for construction in all areas of special flood hazards.

Given that the proposed residential housing would be located outside of the 100-year flood event area shown in Figure 10-2, the proposed project would not place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, FIRM, or flood hazard delineation map.

The proposed project would also be required to construct off-site infrastructure improvements, namely water, sewer, and roadway improvements. For example, the project would improve the south side of PFE Road, east of Antelope Road to the proposed sewer lift station lot (Lot I), for approximately 550 linear feet. All of the off-site improvements required to be constructed as part of the project are located outside of the 100-year floodplain. While not required as part of this project, this EIR analyzes the potential environmental effects associated with potential future ultimate widening of PFE Road along the remainder of the project's PFE Road frontage, consistent with the DCWPCP. Such future widening would require widening the south side of PFE Road, including the current bridge over the Dry Creek tributary that runs along the project's eastern boundary.

The deferred off-site roadway improvements not required for this project could coincide with the 100-year floodplain limits shown in Figure 10-2. However, the proposed improvements would be subject to Article 15.52, Flood Damage Prevention Ordinance, of the Placer County Code, which is intended to minimize public and private losses due to flood conditions, including where public facilities and utilities are located within areas of special flood hazard. The Flood Damage Prevention Ordinance provides methods for reducing flood losses, and sets forth standards for construction in all areas of special flood hazards.

Thus, the project would not expose people or structures to a significant risk of loss, injury or death involving flooding. Furthermore, the proposed off-site improvements would not impede or redirect flood flows within a 100-year floodplain. Therefore, a ***less-than-significant*** impact would occur.

Mitigation Measure(s)
None required.

10-5 Interfere substantially with groundwater recharge or alter the direction or rate of flow of groundwater. Based on the analysis below, the impact is *less than significant.*

The proposed project would involve an increase in impervious surfaces, which would reduce the infiltration of groundwater. Groundwater relies on annual rainfall and percolation through pervious soils to recharge the system. As noted previously, the predominant soils within the proposed project site are Group B and D hydrologic soils. Group B soils, which have high infiltration rate and provide opportunity for recharge, are located along Dry Creek and within the creek's floodplain. Given that the portion of the site adjacent to the Dry Creek tributaries, including the floodplain area, would be retained as open space, the recharge potential of the area would not be substantially affected by the proposed project.

The remainder of the site is defined by Group D soils, which have slow infiltration rates with high runoff potential. Due to the aforementioned soil characteristics, the portion of the site on which development would occur would not qualify as an important groundwater recharge area protected by Policy 6.A.10b of the Placer County General Plan.

Given the limited recharge potential of the portion of the project site that would be developed with impervious surfaces, the proposed project would not interfere substantially with groundwater recharge. Furthermore, as noted previously, the groundwater subbasin within which the project site is located is not currently in a state of overdraft. Thus, impacts related to interfering with groundwater recharge or altering the direction or rate of flow of groundwater would be ***less than significant***.

Mitigation Measure(s)
None required.