

10

HYDROLOGY AND WATER QUALITY

10.1 INTRODUCTION

The Hydrology and Water Quality chapter of the EIR describes existing drainage patterns on the Whitehawk I (WHI) and Whitehawk II (WHII) project sites and downstream waterways, existing stormwater infrastructure, and potential for flooding. The chapter evaluates potential impacts of the proposed projects 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 Hydrology and Hydraulics Study prepared for the proposed projects by Michael S. Thomas, P.E. (see Appendix J),¹ as well as Post-Construction Storm Water Quality Plans prepared for both the WHI and WHII projects by TSD Engineering, Inc. (see Appendix K).² In addition, information was drawn from the Placer County General Plan,³ the Placer County General Plan EIR,⁴ the Granite Bay Community Plan (GBCP),⁵ the *Dry Creek Watershed Coordinated Resource Management Plan* (DCWCRMP),⁶ and the *Update to the Dry Creek Watershed Flood Control Plan*.⁷ It should be noted that impacts associated with water supply are addressed in Chapter 15, Utilities and Service Systems, of this EIR.

10.2 EXISTING ENVIRONMENTAL SETTING

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

Regional Hydrology

The project site is located within Granite Bay in unincorporated Placer County, California. Granite Bay is located in the Dry Creek watershed, within the Sacramento River Basin, which is

¹ Michael S. Thomas, P.E. *Meritage Homes – Granite Bay Sites Whitehawk I and Whitehawk II Hydrology and Hydraulics Study and Preliminary Design Recommendations*. May 17, 2016.

² TSD Engineering, Inc. *Post-Construction Storm Water Quality Plan For: Whitehawk I, Placer County, CA*. May 4, 2018.

TSD Engineering, Inc. *Post-Construction Storm Water Quality Plan For: Whitehawk II, Placer County, CA*. May 4, 2018.

³ Placer County. *Countywide General Plan Policy Document*. August 1994 (updated May 2013).

⁴ Placer County. *Countywide General Plan EIR*. July 1994.

⁵ Placer County. *Granite Bay Community Plan*. Adopted February 28, 2012.

⁶ Placer and Sacramento Counties. *Dry Creek Watershed Coordinated Resource Management Plan*. December 31, 2003.

⁷ Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan*. November 2011.

bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Delta-Central Sierra area to the south. The Sacramento River is the principal river in the basin.

The primary streams in Granite Bay are Miners Ravine, Linda Creek and Strap Ravine. Miners Ravine is a perennial stream, flowing year-round. Linda Creek and Strap Ravine, a tributary to Linda Creek, were noted as intermittent in 1997, though U.S. Geological Survey (USGS) maps characterize Linda Creek as perennial. Most flow arises from precipitation; with summertime flow augmented by irrigation and treated water discharges from the City of Roseville's Water Treatment Facility on Linda Creek. The DCWCRMP found that the loss of riparian vegetation, stream bank erosion, and sedimentation of the streams have contributed to the decline of water quality in the watershed.

Dry Creek Watershed

Per the GBCP, the Dry Creek watershed's topography ranges from relatively flat along Dry Creek in the southern and western portion of the watershed, to gently rolling hills in the mid-reaches of the watershed, to more prominent steeper hills and varied terrain in the upper regions of the watershed. Elevations in Granite Bay range from approximately 800 feet above Mean Sea Level (msl) near Lake Forest Drive to approximately 180 feet above msl downstream where Linda Creek crosses into Roseville.

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 and its tributaries within west Placer County have an extensive record of flooding and flood damage to areas within the lower portion of the creek's watershed, including the Roseville area. 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.⁸

Strap Ravine

Strap Ravine is approximately 3.6 miles long and drains an area of approximately 4.8 square miles. Significant dredge/mining operations have occurred within Strap Ravine, as evidenced by the presence of dredge tailings shown on USGS topographical maps of the subwatershed. Mining has affected stream channel configuration.

Proposed Project Sites Hydrology

Currently, the WHI site is undeveloped with topography characterized by rolling slopes ranging from flat to 20 percent grade. A small portion of the WHI site at the northwest corner flows to the north and west, away from the site and through a separate drainage way that merges with Strap Ravine downstream of Sierra College Boulevard. The remainder of the site drains by sheet flow and collector flow directly to Strap Ravine, which traverses the site from east to west. Strap Ravine slopes approximately 0.5 percent across the site.

The WHII site is undeveloped with topography that is characterized by intermittent low and high areas. Slopes are highly variable across the terrain. Strap Ravine traverses the site from east to west in the northern third of the site at a slope of approximately 1.5 percent. A drainage to Strap Ravine traverses the site diagonally from the southeast to the northwest for a distance of approximately 495 feet. The unnamed tributary has a poorly defined channel due to past mining activities. The tributary flows into and through an existing pond before merging with Strap Ravine. The slope of the tributary ranges from flat to 20 percent. Similar to the WHI site, stormwater runoff from the WHII site generally flows by sheet flow and collector flow directly into Strap Ravine.

Peak Flow Characteristics

Soils at the WHI and WHII sites are composed of Group B and Group D hydrologic soil group types. Group B soils are primarily limited to the streambed of Strap Ravine; the remainder of the sites is dominated by hydrologic group D soils, which have relatively low infiltration potential and generate relatively high rates of runoff. Stormwater runoff estimates for existing conditions on the project sites are summarized in Table 10-1 below. Flows are expressed in units of cubic feet per second (cfs). The local reach of Strap Ravine immediately downstream of the WHI and WHII sites has a 100-year peak flow of approximately 838.5 cfs. Further downstream, at the Sierra College Boulevard crossing, Strap Ravine has a 100-year peak flow of approximately 712.2 cfs.

⁸ Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. ES-2]. November 2011.

Table 10-1				
Peak Flow Characteristics – Existing Condition				
Point of Comparison	Peak Flow Rate (cfs)			
	2-Year	10-Year	25-Year	100-Year
Strap Ravine: Downstream of WHI	59.3	355.9	548.8	838.5
Strap Ravine: Sierra College Blvd.	58.1	282.9	445.4	717.2
<i>Source: Michael S. Thomas, P.E., 2016.</i>				

Flooding Risk

Flooding occurs when the conveyance capacity of a channel is exceeded, usually as a result of above-average runoff caused by precipitation or snowmelt, or otherwise as a result of manmade causes. Areas within Placer County subject to 100-year (one percent chance) and 500-year (0.2 percent chance) flooding are generally confined to the areas adjacent to the County’s local rivers and streams.⁹

The WHI and WHII sites are located within the areas shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Map Number 06061C1052H, effective November 2, 2018. Per the FIRM, both sites contain an existing 100-year flood hazard area associated with Strap Ravine. Figure 10-1 and Figure 10-2 provide an overview of the FEMA-designated 100-year flood plain within the WHI and WHII sites, respectively, along with existing 100-year flood surface elevations modeled as par to the Hydrology and Hydraulics Study prepared for the proposed projects.

Water Quality

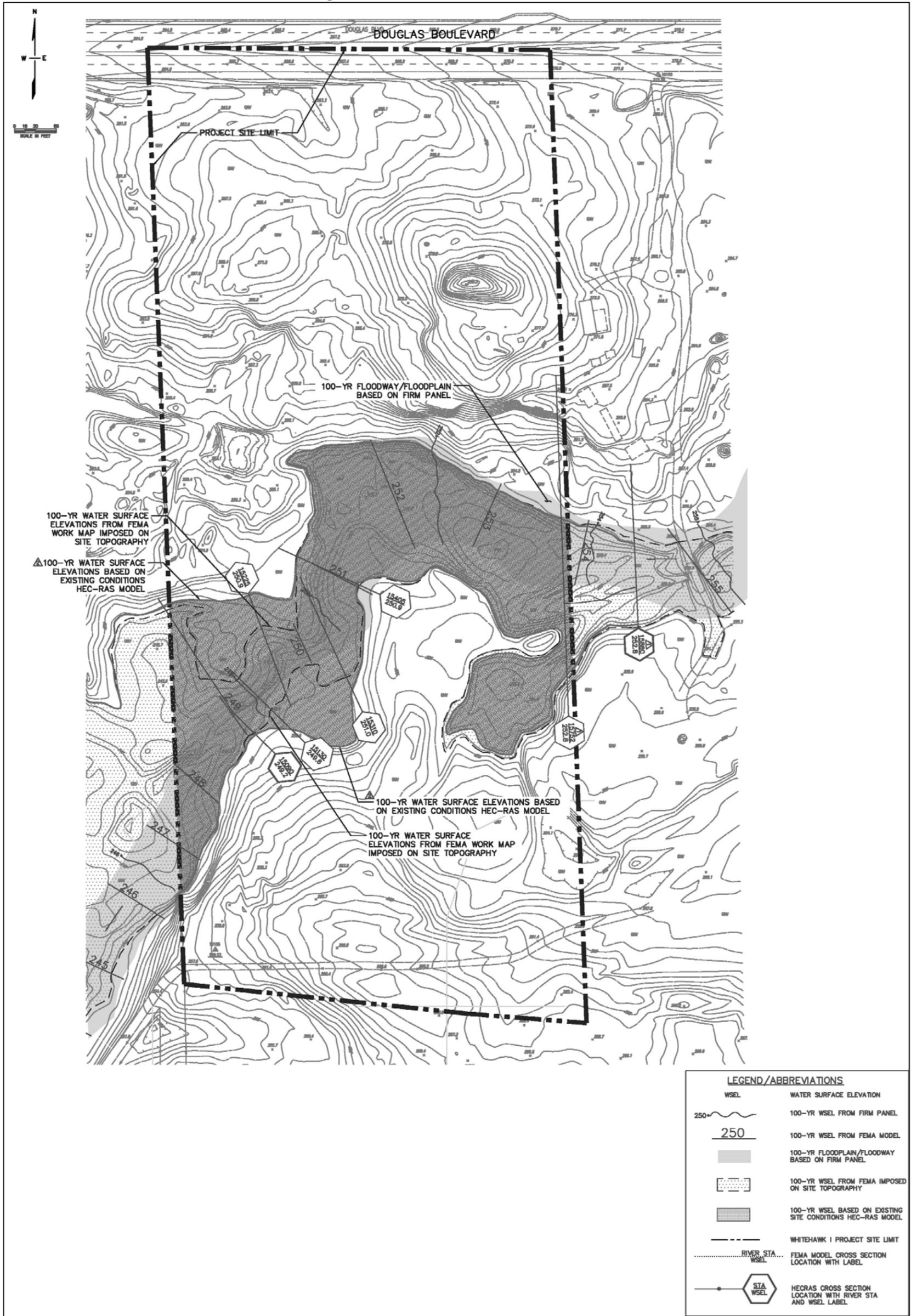
Land uses and activities that the County must consider in protecting the quality of the County’s water due to their associated potential for pollutants to enter the waterways include construction activities and urban runoff.

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).

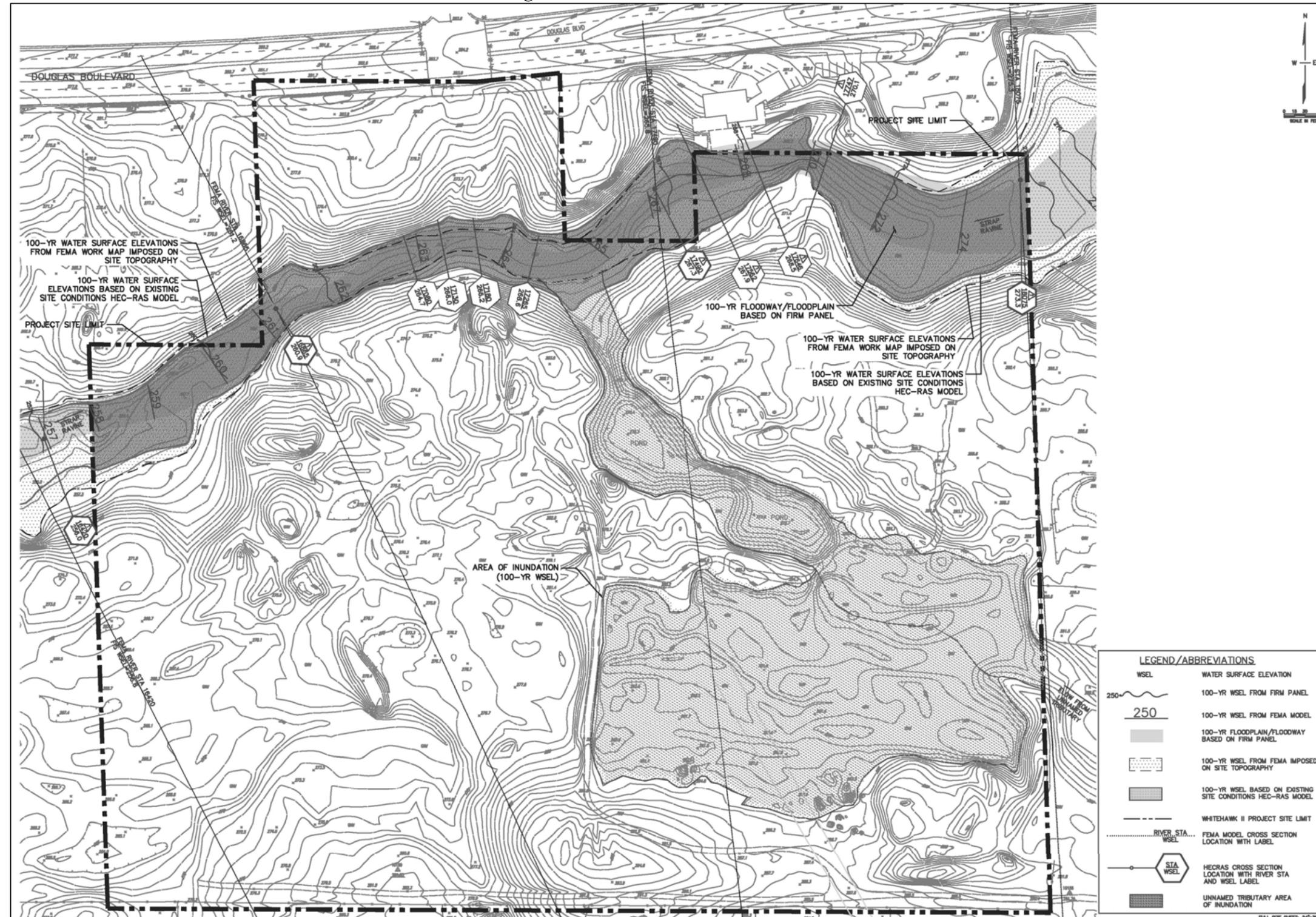
⁹ Placer County. *Granite Bay Community Plan* [pg. 74]. Adopted February 28, 2012.

Figure 10-1
 Existing 100-Year Flood Surface Elevations: WHI



Source: Michael S. Thomas, P.E., 2016.

Figure 10-2
 Existing 100-Year Flood Surface Elevations: WHII



Source: Michael S. Thomas, P.E., 2016.

Groundwater

The Dry Creek watershed lies above the North American sub-basin of the Sacramento Valley groundwater basin. Per the GBCP, the Sacramento Valley groundwater basin is composed primarily of Continental Rocks and Deposits Pliocene to Holocene, with some deposits of Continental Rocks and Deposits Eocene and River Deposits Holocene. Depth to groundwater is approximately 161 feet (upper watershed) to 13 feet (lower watershed) below ground surface. Under natural (predevelopment) conditions, the aquifer was recharged by seepage from snowmelt- and rainfall-fed streams and channels running from the mountains into the valley area. Most of the recharge occurred at the valley margins and groundwater discharged into surface water bodies at the lower valley altitudes. From the 1860's to the 1960's, groundwater hydraulic head dropped 40 to 80 feet within the lower confined aquifer in this area. By 1975, however, levels were back to near pre-development conditions due to increased use of surface water resources.

Depths to domestic wells in the area are approximately 50 to 1,750 feet (mean 665). Yields range from 742 to 2,500 gallons per minute and withdrawals are approximately one acre-foot per acre per year. Most of the basin has good water quality; however, localized portions may have marginal water quality due to natural variability in the aquifer.

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 projects.

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 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 National Pollutant Discharge Elimination System (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 projects.

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 sites are 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 Granite Bay.

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.

Senate Bill 5

In 2007, the State of California set the 200-year event as the Urban Level of Flood Protection (ULOP) for the State through a series of laws included in Senate Bill (SB) 5. Along with other related legislation, SB 5 established a mandate for local governments to amend their general plans and zoning codes to be consistent with State law on floodplain management. Specifically, SB 5 requires all cities and counties within the Sacramento-San Joaquin Valley, as defined in California Government Code Sections 65007(h) and (j), to make findings related to an ULOP or the national FEMA standard of flood protection before: (1) entering into a development agreement for any property that is located within a flood hazard zone; (2) approving a discretionary permit or other discretionary entitlement, or a ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or (3) approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone. The primary purpose of the law is to ensure that appropriate flood protection is provided in urban and urbanizing areas. Placer County

has amended the County's flood management policies to bring the County into compliance with State law and provide for increased flood protection for urban areas, consistent with SB 5.¹⁰

A project would be subject to the requirements of SB 5 if the project would meet all of the following five criteria:

1. Located within an urban area that is a developed area, as defined by Code of Federal Regulations Title 44, Section 59.1, with 10,000 residents or more, or an urbanizing area that is a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years.
2. Located within a flood hazard zone that is mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) FIRM for the NFIP.
3. Located within the Sacramento-San Joaquin Valley.
4. Located within an area with a potential flood depth above 3.0 feet, from sources of flooding other than localized conditions that may occur anywhere in a community, such as localized rainfall, water from stormwater and drainage problems, and water from temporary water and wastewater distribution system failure.
5. Located within a watershed with a contributing area of more than 10 square miles.

While the proposed projects would meet the majority of the criteria, because the project sites are located within the Strap Ravine subwatershed, which is approximately 4.8 square miles, the projects do not meet Criteria 5. Thus, the proposed projects would not be subject to the requirements of SB 5.

Local Regulations

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

Placer County General Plan

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

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.

¹⁰ Placer County. *Placer County moves to meet state flood standards for urban areas*. Available at: <https://www.placer.ca.gov/news/2015/nov/placer-meets-state-flood-standards>. November 5, 2015.

- 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.

Policy 6.A.15 The County shall encourage the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.

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

Granite Bay Community Plan

The following goals and policies from the GBCP related to hydrology and water quality are applicable to the proposed projects:

Goal 5.2.3 Ensure that land use planning contributes to the protection, improvement, and restoration of water resources and that all new development has a minimum impact on the established natural environment.

Goal 5.2.4 Pursue and implement sound storm water management practices and sustainable management practices to help ensure protection from flooding and erosion and maintain, and where feasible, improve water quality.

Policy 5.3.8 All stream influence areas, including floodplains and riparian vegetation areas shall be retained in their natural condition, while allowing for limited stream crossings for public roads, trails, and utilities.

Policy 5.3.10 The standards of the Placer County Grading Ordinance and this Resources section of the Granite Bay Community Plan shall be implemented for all projects in the Granite Bay area.

Policy 5.3.11 New construction shall not be permitted within 100 feet of the centerline of permanent streams and 50' of intermittent streams, or within the 100 year floodplain, whichever is greater.

Policy 5.3.12 In implementing Best Management Practices, the County shall promote consideration of the concepts of low impact development, and sustainable technology, and current standards of the County to address the quantity and quality of storm water run-off released to any watercourse.

Policy 5.3.14 Individual sites and properties can contribute to the health of the environment by incorporating measures such as:

- Using renewable energy sources such as solar or geothermal energy;
- Planting additional trees in appropriate locations;

- Managing storm water runoff using storm water best management practices;
- Naturalizing landscapes with native, non-invasive species; and,
- Installing ‘green roofs’ or light-colored roofs.

Goal 6.1.2 Protect and preserve those areas necessary to the integrity of the natural processes with special emphasis on, but not limited to, the water regimen.

Policy 6.2.2 Protect natural areas along creeks and canals.

Policy 6.2.5 Areas hazardous to the public safety and welfare shall be open or predominantly open. This category includes:

- a. Areas subject to landslide or with severe slope instability problems;
- b. Streams and other areas subject to flooding by the 100-year storm; and,
- c. Areas of high noise exposure.

Policy 6.2.9 In the design and development of new subdivisions, the following types of areas and features shall be preserved as open spaces to the maximum extent feasible: high hazard areas, scenic and trail corridors, streams, streamside vegetation, other significant stands of beneficial native vegetation, and any areas of special ecological significance.

Goal 8.4.1.1 Protect the lives and property of the citizens of the Granite Bay area from unacceptable risk resulting from flood hazards.

Policy 8.4.1.4 Retain natural flow conditions within the 100-year floodplain of all streams except where work is required to maintain the stream's natural drainage characteristics as determined by Placer County Flood Control District.

NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit

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. Both the WHI and WHII projects would create more than one acre of impervious area, and, thus, are considered Regulated Hydromodification Management Projects 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 projects, is included in the *West Placer Storm Water Quality Design Manual*.¹¹

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,

¹¹ Placer County, City of Roseville, City of Lincoln, City of Auburn, Town of Loomis. *West Placer Storm Water Quality Design Manual*. April 2016.

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 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.¹²

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

¹² Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan*. November 2011.

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 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, within which both the WHI and WHII project sites are located. 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 projects' 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.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines and the County's Initial Study Checklist, a significant impact would occur if the proposed projects 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 projects' impacts associated with water supplies (including groundwater supplies) are discussed in Chapter 15, Utilities and Service Systems, of this EIR.

Issues related to the following topic areas are discussed in Chapter 16, Effects Not Found to be Significant, of this EIR, including whether the proposed projects would:

- 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.

Method of Analysis

The impacts analysis for this chapter is based primarily on the Hydrology and Hydraulics Study prepared for the proposed projects by Michael S. Thomas, P.E. and the Storm Water Quality Plans (SWQPs) prepared for each of the projects. Determinations of significance were made based on comparison of the existing conditions quantified above with the modeled post-project conditions.

Hydrologic and Hydraulic Study Methodology

The methodology contained in the 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 projects. The drainage basins and flow patterns for the developed and undeveloped conditions were determined from existing topography and the proposed grading plans.

Hydrology

The hydrology of the WHII was previously studied by Civil Solutions, Inc. in 2008 (CSI 2008). The hydrology presented in CSI 2008 was based on the JMM 1992 Hydraulic Engineering Center (HEC) water surface profiles computer model (HEC-2) of the Dry Creek Watershed. The report identified that the off-site flow contribution coming through the unnamed tributary was 187 cfs. Subsequently, in 2011, a restudy of hydrology of the Dry Creek Watershed was published by Civil Solutions, Inc. and RBF Consulting (CSI/RBF 2011). Data from both of such prior studies was used to examine flows within both the WHI and WHII sites. In the case of the former report, the 187 cfs flow rates for the unnamed tributary was used as the preliminary design basis for recommendations for the reconstruction of the tributary. This flow rate from the 1992 JMM study, represents flow that would occur with the full-build out of the General Plan.

Hydraulics

The HEC-RAS computer model was used to analyze the water surface profiles along Strap Ravine as the channel crosses the WHI and WHII sites and, in combination with existing site topography, the limits of inundation associated with the 100-year storm. The FEMA Flood Insurance Study (FIS) model was used as the starting point for the analysis. The FIS model was prepared in 1994-1995 and used the U.S. Army Corps of Engineers (USACE) HEC-2 model to determine the water surface profiles for the 10-year, 50-year, and 100-year flood events. The 100-year flood event was used for the purposes of the Hydrology and Hydraulics Study in order to provide a conservative analysis. The FIS flow rate of 850 cfs for the 100-year flood event was used to assess floodplain limits and proposed projects impacts.

Since completion of the FIS study, a new culvert crossing was installed at Greyhawk Drive, downstream of site Whitehawk I. The HEC-RAS version of the FIS model was modified to incorporate the new culvert crossing to develop the “Corrected FIS” model. Data for the new crossing was extracted from construction drawings provided by Placer County Engineering and Surveying Division for the Gladstone Park Development Project dated May, 2000. The results demonstrate that the new culvert crossing reduces 100-year water surface elevations in Strap Ravine but the reduction tapers to zero on the downstream side of the WHI site. Current site topography was used to update FIS cross-section data, where FIS sections fell within the limits of the current topography. The Corrected FIS model was updated to incorporate the new topographic data and was used to model existing conditions within the WHI and WHII sites.

Because both the WHI and WHII sites would include a road crossing over Strap Ravine, the HEC-RAS model was used to evaluate the road crossings by superimposing preliminary site grading plans onto the Existing Conditions model. Crossings were modeled as bridges to enable retention of the existing channel form in the calculations. The modeled configuration for both sites represents a clear span of 50 feet (modeled as CONSPAN-type precast arches).

Preliminary Post-Construction SWQPs

The SWQPs prepared for the proposed projects were 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 Hydrologic and Hydraulic Study, as well as applicant-provided information.

Project Impacts and Mitigation Measures

As discussed in Chapter 3, Project Description, of this EIR, although the County has elected to evaluate both the WHI and WHII projects in a single EIR, it is reasonable to consider WHI and WHII as separate projects under the independent utility test, given that each proposal has independent utility and is not necessary for the other to proceed. The following discussion of impacts is based on implementation of both projects. Where the analysis required of the two projects is highly similar, the discussion of impacts presented below is applicable for both projects together. However, where potential impacts and/or the scope of analysis differs between the two projects, the impacts are discussed separately for each project.

- 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*.**

WHI and WHII

Construction of the WHI and WHII projects 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 Strap Ravine or other receiving waters within the project vicinity.

Soils exposed by the aforementioned types of construction activities 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 WHI and WHII projects would require construction activities that would result in a land disturbance of 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 each of the projects, 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. In addition, a Notice of Intent (NOI) would be filed with RWQCB.

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, the proposed projects would be required to implement BMPs, including 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 materials management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The Construction 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 NOI would be filed with the 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.

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(a), 8-2(b), 8-3(a), and 8-3(b), would minimize the potential degradation of stormwater quality and downstream surface water associated with construction of the proposed projects. Implementation of such mitigation measures would be required in order to ensure that construction-related soil erosion issues would not degrade water quality. Furthermore, excavation activities associated with project construction could encounter contaminated groundwater. Therefore, a *significant* impact related to short-term construction-related water quality could occur.

Mitigation Measure(s)

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

WHI and WHII

10-1 Implement Mitigation Measures 8-2(a), 8-2(b), 8-3(a), and 8-3(b).

- 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*.**

Urban runoff is typically associated with impervious surfaces, such as rooftops, streets, and other paved areas, where various types of pollutants may build up and eventually be washed into the storm drain system after storm events. Development of the proposed projects would result in the conversion of an undeveloped 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 projects 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 projects 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 pathways, 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 projects are 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 projects, 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 Low Impact Development (LID) measures that result in post-project flows that mimic pre-project conditions.

Proposed Storm Drain System: WHI

Per the WHI SWQP, the WHI project would include an on-site storm drain system with LID bio-retention basins (see Figure 10-3). Consistent with MS4 permit requirements, the WHI site would be divided into three DMAs. Runoff from on-site impervious areas within the three DMAs would be routed, by way of AC dikes along the proposed internal roadways, to new inlets within each DMA. The inlets would convey runoff, by way of new underground stormwater drainage pipes, to a series of three bio-retention basins (Basin #1, #2, and #3). As noted in the WHI SWQP, the bio-retention basins would be designed consistent with the recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or from another equivalent manual.

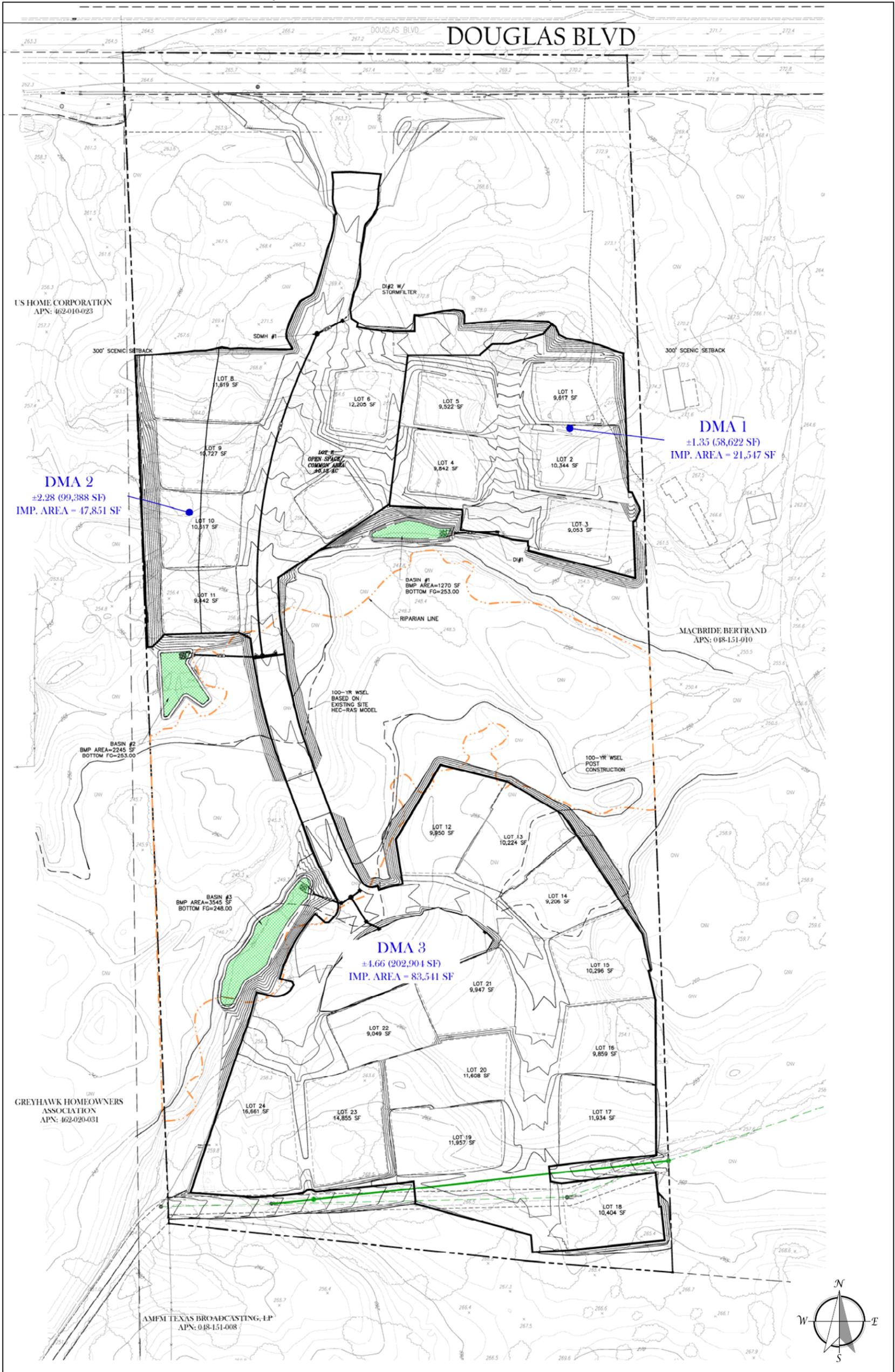
Each bio-retention basin would treat runoff by filtering out pollutants; the basins would be sized to treat the first flush, which includes a majority of the larger pollutants (sand, soil, silt, grease and trash) as well as smaller pollutants (sediment, nutrient, metals, pesticides and organics). Treated runoff would exit the basins and flow to Strap Ravine. Thus, WHI project runoff entering Strap Ravine would be properly treated and would not pollute downstream waterways.

Proposed Storm Drain System: WHII

Per the WHII SWQP, the WHII project would include an on-site storm drain system with LID bio-retention basins (see Figure 10-4). Consistent with MS4 permit requirements, the WHII site would be divided into six DMAs. Runoff from on-site impervious areas within the six DMAs would be routed, by way of AC dikes along the proposed internal roadways, to new inlets within each DMA. The inlets would convey runoff, by way of new underground stormwater drainage pipes, to a series of six bio-retention basins (Basins #1 through #6). As noted in the WHII SWQP, the bio-retention basins would be designed consistent with the recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or from another equivalent manual.

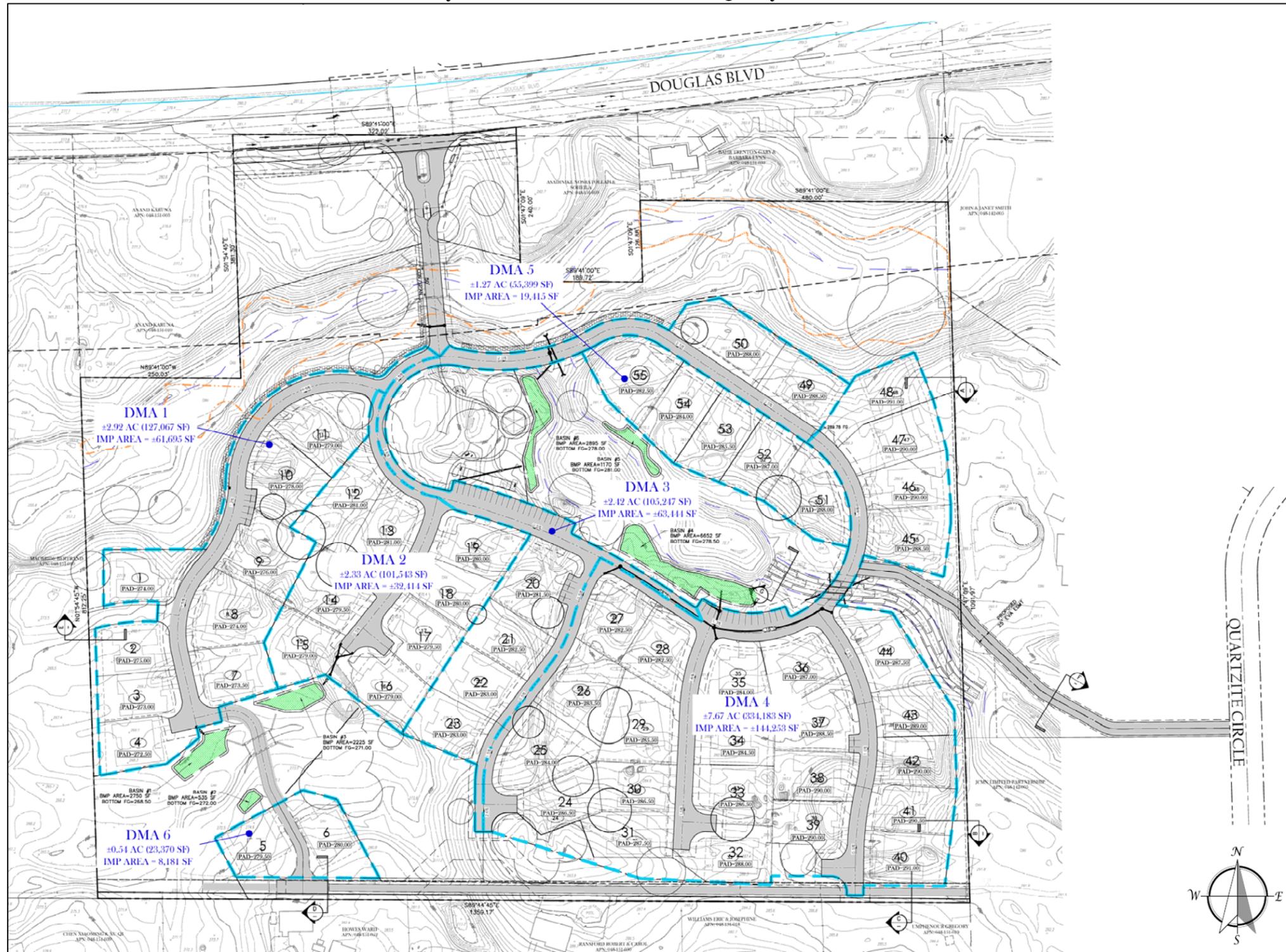
Each bio-retention basin would treat runoff by filtering out pollutants; the basins would be sized to treat the first flush, which includes a majority of the larger pollutants (sand, soil, silt, grease and trash) as well as smaller pollutants (sediment, nutrient, metals, pesticides and organics). Treated runoff would exit the basins and flow to Strap Ravine. Thus, WHII project runoff entering Strap Ravine would be properly treated and would not pollute downstream waterways.

Figure 10-3
Preliminary Post Construction Stormwater Quality Control Plan: WHI



Source: TSD Engineering, Inc., 2018.

Figure 10-4
 Preliminary Post Construction Stormwater Quality Control Plan: WHII



Source: TSD Engineering, Inc., 2018.

Maintenance and Inspection: WHI and WHII

In order to ensure that the proposed bio-retention basins and permeable pavement areas continue to adequately treat runoff throughout the lifetime of the projects, the SWQP includes site-specific inspection and maintenance procedures to be implemented by the project applicants. For example, plants and vegetation within the bio-retention basins would be inspected monthly, and invasive species/weeds would be removed annually. Required maintenance activity would include removal of debris from bio-retention basins and basin outlets. Implementation of the inspection and maintenance procedures for the bio-retention basins would ensure that the polluted runoff would not enter downstream water bodies during the continued operation of the projects.

Conclusion

Based on the above, the proposed projects would properly treat stormwater runoff prior to discharge from the sites. Thus, urban pollutants entering and potentially degrading the local water quality would not be expected to occur as a result of the projects. 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 applicants fail to comply with such requirements, the WHI and WHII projects 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.

WHI and WHII

10-2(a) *Implement Mitigation Measure 8-3(a).*

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 Homeowners Association is responsible for maintaining the legibility of stamped messages and signs. (ESD)*

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)). Project-related stormwater discharges are subject to all applicable requirements of said permit.*

The project applicant 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 storm water, and provide baseline hydromodification management as outlined in the West Placer Storm Water Quality Design Manual. (ESD)

10-2(d) *Per the State of California NPDES Phase II MS4 Permit, the WHI and WHII projects are Regulated Projects 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 the projects 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.

WHI and WHII

Table 10-2 provides a summary of the total proposed impervious area included in each DMA for both projects. As shown in the table, 152,939 sf (3.51 acres) of impervious surfaces would be developed on the WHI site, or approximately 19 percent of the total site area. For the WHII project, 329,402 sf (7.56 acres) of impervious surfaces would be developed on the WHII site, or approximately 23 percent of the total site area.

Table 10-2 Proposed DMAs		
WHI		
DMA	Total Area (sf)	Proposed Impervious Area (sf)
1	58,622	21,547
2	99,388	47,851
3	202,904	83,541
Total:	360,914	152,939
WHII		
1	127,067	61,695
2	101,543	32,414
3	105,247	63,444
4	334,183	144,253
5	55,399	19,415
6	23,370	8,181
Total	746,809	329,402
<i>Source: TSD Engineering, Inc., 2018.</i>		

Due to the increase in impervious surfaces on the site, the proposed projects would have the potential to substantially alter the drainage pattern of the WHI and WHII sites and increase runoff entering Strap Ravine.

Peak Flows

Upon development of the proposed projects, stormwater runoff from new impervious surfaces would be routed through the proposed stormwater drainage systems, including the proposed bio-retention basins, before discharging to Strap Ravine. While some stormwater runoff would infiltrate the soils underlying the bio-retention basins, in general, the proposed stormwater systems would not be designed to provide for detention. This would be consistent with the County’s approach to peak flow management in the watershed. The project site is located in an area identified in the Dry Creek Watershed Flood Control Plan where local stormwater detention is not recommended. Mitigation measures for development in this area include flood control development fees to fund regional detention basins to reduce flooding on major streams in the Dry Creek watershed (see Mitigation Measure 10-3(b) below).

To assess potential impacts of the WHI and WHII projects on flows within Strap Ravine in the project vicinity, both project sites were modeled with impervious surfaces ranging from 35 percent to 65 percent. The results of the analysis are summarized in Table 10-3 below. It is important to note that these results reflect flows that would result from full buildout of the land uses shown in the various community plans and General Plan. Peak flow rates shown in Table 10-3 are for Strap Ravine and include the 187 cfs of flow through the reconstructed unnamed tributary that flows through the WHII site.

Table 10-3				
Peak Flow Characteristics – Post-Development Conditions				
Condition	Peak Flow Rate (cfs)			
	2-Year	10-Year	25-Year	100-Year
Strap Ravine: Downstream of WHI				
Existing	59.3	355.9	548.8	838.5
With 35% impervious surfaces	60.2	357.3	547.2	840.1
With 65% impervious surfaces	60.8	358.3	548.0	840.8
Strap Ravine: Sierra College Blvd.				
Existing	58.1	282.9	445.4	717.2
With 35% impervious surfaces	59.0	284.7	447.1	719.0
With 65% impervious surfaces	59.6	285.9	448.2	720
<i>Source: Michael S. Thomas, P.E., 2016.</i>				

As shown in the table, the 100-year post development peak flows downstream of the site were shown to increase from 838.5 cfs to 840.8 cfs, approximately 2.3 cfs (conservatively) or 0.28 percent. The post-development volume of runoff will be slightly higher due to the increase in proposed impervious surfaces. 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.¹³ 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, while the projects would provide for treatment of on-site stormwater runoff, the projects would not include substantial detention of on-site stormwater runoff.

The proposed projects 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 building permit issuance and an annual fee that is included in each proposed Lot’s property tax. Both fees are based per unit on a calculation that was included in the preparation of the Dry Creek Watershed Drainage Improvement Ordinance.

Conclusion

Based on the above, the proposed projects would result in a relatively minor increase in peak runoff relative to existing conditions. 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 projects could result in a

¹³ Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. 66]. November 2011.

significant impact related to 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.

WHI and WHII

- 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. (ESD)*
- 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. Chapter 15, Article 15.32, Placer County Code.) The current estimated development fee is \$328 per single family residential unit, payable to the Engineering and Surveying Division prior to Building Permit issuance. The fees to be paid shall be based on the fee program in effect at the time that the application is deemed complete. (ESD)*
- 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 these annual assessments. The current estimated annual fee is \$43 per single family residential unit. (ESD)*

- 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 and with implementation of mitigation, the impact is less than significant.**

WHI and WHII

Currently, the portion of Strap Ravine along the WHI and WHII sites is defined and mapped as a 100-year flood hazard area per FEMA. The proposed subdivision improvements would not be located within the FEMA floodplain except for the proposed roadway crossings (e.g., one crossing per project).

Per the Hydrology and Hydraulics Study, development of the WHI and WHII projects, including the proposed CONSPAN-type bridge crossings over Strap Ravine, would not redirect 100-year flood flows within the Strap Ravine channel. The upstream and downstream 100-year flood water surface elevations would not be significantly increased after development of the sites (0.02 foot to 0.04 foot increase). However, any base flood water-surface elevation (WSEL) increase from proposed construction within a regulatory floodway requires a Conditional Letter of Map Revision (CLOMR) through FEMA. The post-project 100-year floodplains for WHI and WHII are shown in Figure 10-5 and Figure 10-6, respectively.

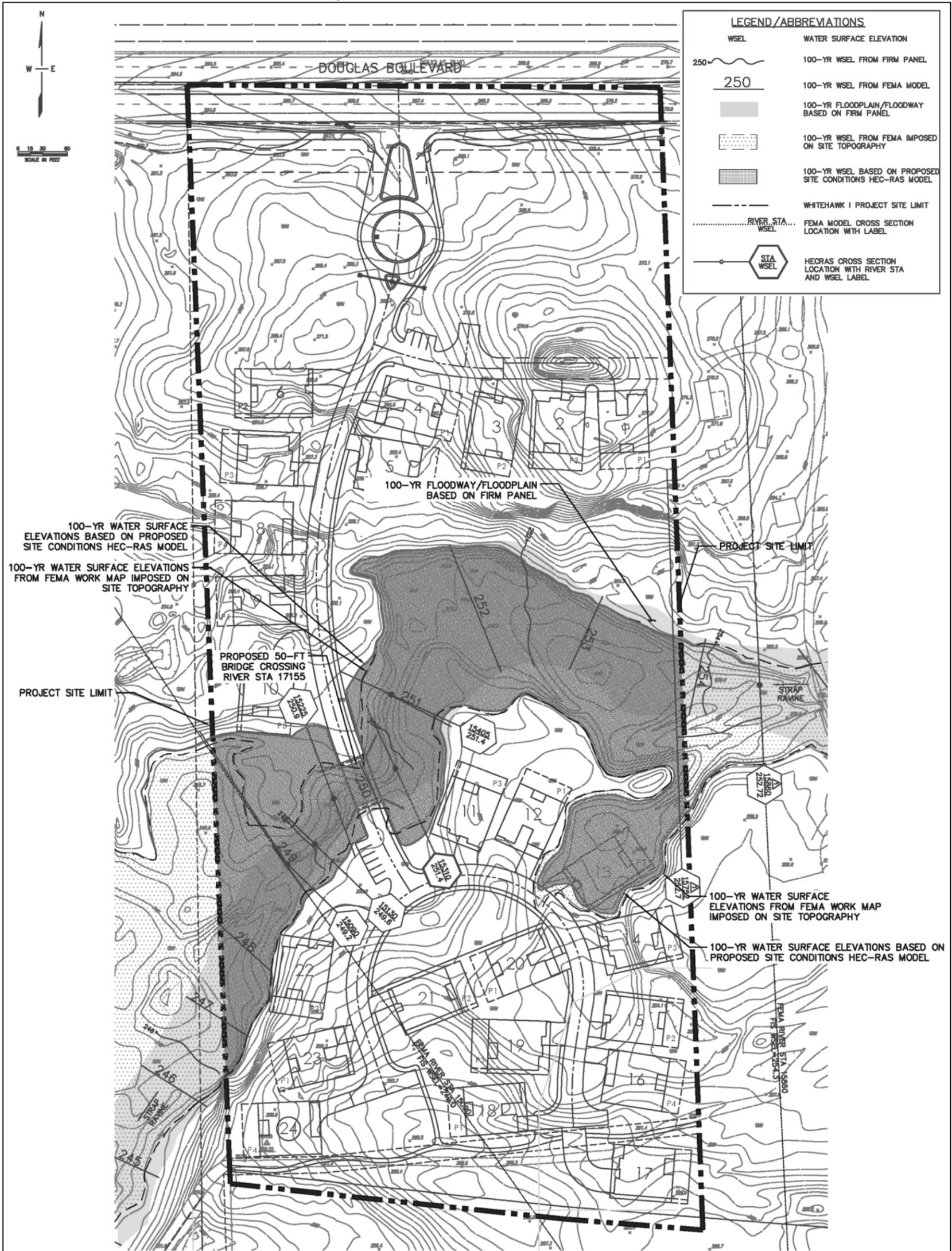
There are also local 100-year flood hazard areas that have been identified on the sites. The projects propose to fill in some portions of the local 100-year flood hazard area. The County determined that the existing local 100-year flood hazard area is not the historical 100-year flood hazard area and was created as a result of mining activities. Therefore, the determination concluded that portions of the existing local 100-year flood hazard area could be filled in and developed.

The proposed projects' improvements and storm drain systems will not significantly alter the upstream or downstream 100-year floodplain limits and no flood flows would be significantly redirected after construction of the improvements.

Conclusion

Based on the above, the WHI and WHII projects 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. In addition, while the proposed projects would require construction of bridges over Strap Ravine, the bridges would be CONSPAN structures and would not impede or redirect flood flows.

Figure 10-5
 Post-Project 100-Year Flood Surface Elevations: WHI



Source: Michael S. Thomas, P.E., 2016.

Figure 10-6
 Post-Project 100-Year Flood Surface Elevations: WHII



Source: Michael S. Thomas, P.E., 2016.

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. The proposed project sites are not located within any levee or dam failure inundation areas.

A final drainage report would be prepared and submitted with the WHI and WHII site improvement plans for County review and approval in order to monitor the preliminary report drainage calculations and results and to confirm the 100-year floodplain limits and pre and post development upstream/downstream water surface elevations. Given the minor increases in water surface elevations in Strap Ravine as a result of the projects, a *significant* impact could occur.

Mitigation Measure(s)

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

WHI and WHII

- 10-4(a) *On the Improvement Plans and Informational Sheet(s) filed with the Final Subdivision Map(s), show the limits of the future, unmitigated, fully developed, 100-year flood plain (after grading) for Strap Ravine across the WHI site and designate same as a building setback line unless greater setbacks are required by other conditions contained herein. (ESD)*
- 10-4(b) *On the Improvement Plans and Informational Sheet(s) filed with the Final Subdivision Map(s), show the limits of the future, unmitigated, fully developed, 100-year flood plain (after grading) for Strap Ravine and the unnamed tributary flowing diagonally across the WHII site from the southeast to the northwest and into Strap Ravine, and designate same as a building setback line unless greater setbacks are required by other conditions contained herein. (ESD)*
- 10-4(c) *On the Improvement Plans and Informational Sheet(s) filed with the Final Subdivision Map(s), show that the finished building pad elevations will be a minimum of two feet above the 100-year flood plain line (or finished floor – three feet above the 100-year floodplain line) for all lots adjacent to Strap Ravine and any unnamed tributary. The final pad elevations shall be certified by a California Registered Civil Engineer or licensed land surveyor and submitted to the Engineering and Surveying Division. This certification shall be done prior to construction of the foundation or at the completion of final grading, whichever comes first. No building construction is allowed until the certification has been received by the Engineering and Surveying Division and approved by the floodplain*

manager. Benchmark elevation and location shall be shown on the Improvement Plans and Informational Sheet(s) to the satisfaction of Development Review Committee. (ESD)

- 10-4(d) *Include the following standard note on the Improvement Plans: “No grading activities of any kind may take place within the 100-year flood plain of the stream/drainage way, unless otherwise approved as a part of this project. All work shall conform to provisions of the County Flood Damage Prevention Regulations (Section 15.52, Placer County Code).” The location of the 100-year flood plain shall be shown on the Improvement Plans. (ESD)*
- 10-4(e) *The final drainage report shall demonstrate that the proposed project will not significantly increase the limits or water surface elevation of the Strap Ravine 100-year floodplain upstream and downstream of the project site to the satisfaction of the Engineering and Surveying Division and the Placer County Flood Control District.*
- 10-4(f) *Prior to Improvement Plan approval and if required by the Federal Emergency Management Agency (FEMA), the applicant shall obtain from FEMA, a Conditional Letter of Map Revision (CLOMR) or Conditional Letter of Map Revision based on Fill (CLOMR-F) for fill within a Special Flood Hazard Area. A copy of the letter shall be provided to the Engineering and Surveying Division prior to approval of Improvement Plans. A Letter of Map Revision (LOMR), or a Letter of Map Revision based on Fill (LOMR-F) from FEMA shall be provided to the Engineering and Surveying Division prior to acceptance of project improvements as complete. (ESD)*

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*.

WHI and WHII

The proposed projects 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 sites are Group B and D hydrologic soils. Group B soils, which have high infiltration rate and provide opportunity for recharge, are located along Strap Ravine, the unnamed tributary on the WHII site, and the 100-year floodplains associated with both channels. Given that the portion of the project sites adjacent to Strap Ravine and the unnamed tributary, including the floodplain area, would be retained as open space, the recharge potential of the project area would not be substantially affected by the WHI and WHII projects.

The remainder of the project sites are defined by Group D soils, which have slow infiltration rates with high runoff potential. Due to the aforementioned soil characteristics, the portion of the sites 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 portions of the project sites that would be developed with impervious surfaces, the WHI and WHII projects would not interfere substantially with groundwater recharge. 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.