4.13 HYDROLOGY AND WATER QUALITY

4.13.1 INTRODUCTION

This section addresses potential hydrologic effects related to drainage and water quality in the Project area. Site characteristics such as regional and local drainage and flooding conditions and water quality are described based on site-specific information and published technical information, as indicated in footnoted references. The primary sources of information for this section regarding drainage, flooding and groundwater conditions are listed below:

- *Creekview Specific Plan Drainage and Stormwater Master Plan,* Civic Engineering Solutions, December 2010.
- *West Roseville Specific Plan Final EIR*, February 2004.
- *Draft Creekview Specific Plan, 2010*
- *City of Roseville Retention Basin Project, Final EIR,* 2003

The documents listed above are available for review during normal business hours at:

City of Roseville Permit Center
311 Vernon Street
Roseville, CA 95678

During circulation of the Notice of Preparation (NOP), no comments regarding stormwater runoff were received. A copy of the NOP can be viewed in Appendix A of this EIR.

4.13.2 ENVIRONMENTAL SETTING

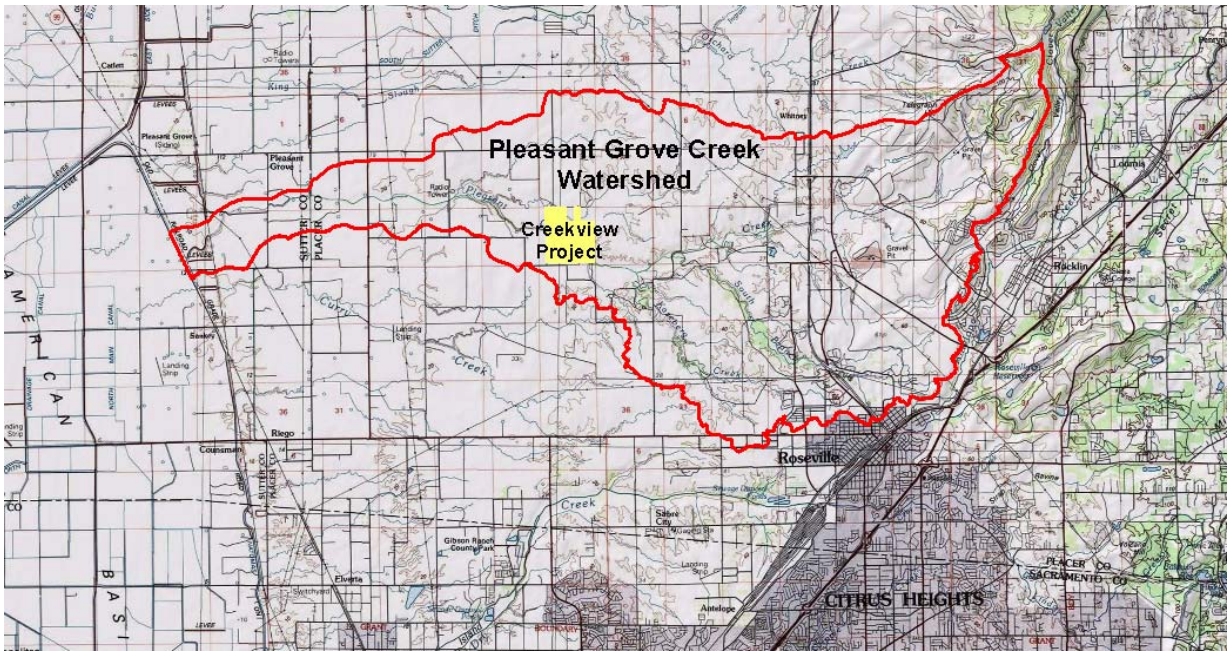
Regional Surface Water Hydrology

The Creekview Specific Plan (CSP) area, including the approximately 40-acre Urban Reserve parcel has an area of approximately 501 acres which is located wholly within the Pleasant Grove Creek watershed. The Pleasant Grove Creek watershed totals approximately 400,000 acres and slopes

from east to west as shown in Figure 4.13-1. The elevation in the upper watershed is approximately 120 feet, decreasing to approximately 45 feet in Sutter County[1]

FIGURE 4.13-1

PLEASANT GROVE CREEK WATERSHED



Pleasant Grove Creek drains to the Natomas Cross Canal via the Pleasant Grove Canal, which conveys drainage from both Placer and Sutter Counties. Stormwater drains into the Sacramento River just south of its confluence with the Feather River, approximately 14 miles west of Roseville. Other watersheds that drain into the Natomas Cross Canal are; Coon Creek, Curry Creek, Auburn Ravine and Markham Ravine.

The Natomas Cross Canal watershed is within the Sacramento River Basin. The Sacramento River Basin covers approximately 26,500 square miles and is 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 principal tributaries to the Sacramento River are the Pit and McCloud Rivers, which join the

[1] West Roseville Specific Plan EIR, February 2004, based on information from Wood Rodgers Inc. Fiddyment-Westpark Master Plan Drainage Analysis.

Sacramento River from the north, and the Feather and American Rivers, which are tributaries from the east. The average runoff from the Basin is estimated to be 21.3 million acre-feet per year.[2]

Creekview Specific Plan Drainage

Drainage from the CSP area flows into two water sheds, the main branch of Pleasant Grove Creek and University Creek, which is a minor tributary to Pleasant Grove Creek. Pleasant Grove Creek is a perennial stream that traverses the site diagonally, entering in the southeast corner and extended northwesterly to the western edge of the Project Area. The southerly two-thirds of the CSP area drains to Pleasant Grove Creek by either overland flow or through wetland swales and ephemeral drainages on the site. University Creek, an intermittent stream tributary to Pleasant Grove Creek, enters the site in the northeast corner and extends westerly through the northern portion of the Project Area. University Creek joins the main branch of Pleasant Grove Creek west of the Project Area.

Stormwater Volume

Sutter County and Reclamation District 1001 have expressed concern with flooding as a result of increased stormwater volumes generated by development in Placer County. In response to these concerns, Placer County and the Cities of Roseville, Rocklin, Lincoln and Auburn participated in the *Auburn Ravine, Coon, and Pleasant Grove Creek Watershed Study* prepared in 1993. The study found that the unmitigated peak flow increases would have the potential to increase flows in the Cross Canal by less than 3.6 inches along tributary streams and volumetric runoff and would have the potential to increase flooding 1.2 inches in the ponding area upstream of the Cross Canal. While shallow, these increases would inundate several hundred additional acres in Sutter County during a major flood. The study recommended a combination of regional and local detention and retention basins, adoption of a regional floodplain management plan, and grading ordinances and policies. Since that time, the City of Roseville established a fee program to construct a regional retention basin at Reason Farms, northwest of the project site. In early 2003, the City certified a final EIR for the City of Roseville Retention Basin Project (SCH#2002072084, hereby incorporated by reference), which is available in the City of Roseville Permit Center, 311 Vernon Street, Roseville, CA 95678, during normal business hours. The City purchased the Reason Farms property, and

[2] EIP Associates, Stoneridge Specific Plan EIR, 1997.

approved the site and conceptual plans for a retention basin flood control project. The City is collecting drainage impact fees to fund construction of the retention basin project. Given the recent slowdown in development, this project will likely not be constructed until at least 2015.

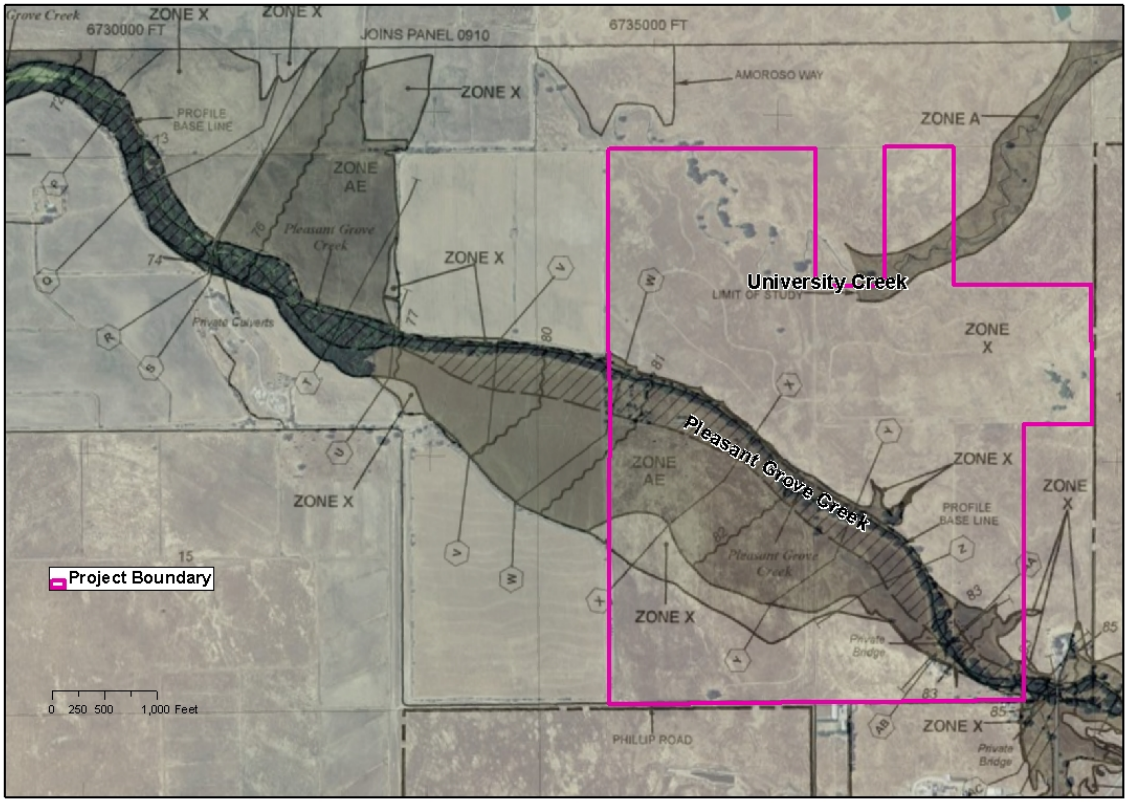
100-Year Floodplain

The Federal Emergency Management Agency (FEMA) published Flood Insurance Rate Maps (FIRM) for the project area. A conceptual FEMA floodplain map is illustrated in Figure 4.13-2. The mapping delineates the boundary of the FEMA 100-year floodplain.

The FEMA analysis first uses its Hec-1 hydraulic model then imports the results into a "1 dimensional steady state" HEC-RAS hydraulics model to determine the limits of the flood plain. The steady state modeling utilizes an unchanging flow assumed to travel in the downstream direction. This method is easiest to set up and run but does not capture overbank flow processes nor does it account for overbank or in-channel storage.

FIGURE 4.13-2

FEMA FLOODPLAIN MAP



CSP PRE-PROJECT FEMA FLOODPLAIN

The Creekview Drainage and Stormwater Master Plan uses the "City Basis" Hydrology model (Hec-1 & HEC-HMS) results as input into a "1 dimensional unsteady state" (HEC-RAS unsteady) condition to determine the "Base Flood Elevations"(BFEs). The unsteady state modeling evaluates flow conditions throughout the entire storm runoff hydrograph, and evaluates the effects of overbank and in-channel storage. This approach yields a more realistic simulation of complex flow patterns, and addresses overbank flows, and flow constrictions at bridge abutments. As illustrated in Figure 4.13-3, the City Basis unsteady state modeling produced a 100-year flood plain that is more expansive then the FEMA flood plain. This modeling approach is what has been used throughout the analysis in this EIR to determine all flood conditions related to the development of the CSP.

The expanse of the 100-year flood plain for both the main branch of Pleasant Grove Creek and University Creek differs from the original conditions on the site. As illustrated in Figure 4.13-4, the original flood plain on the CSP site from both Pleasant Grove Creek and University Creek was smaller and confined to narrower areas associated with the creek channels. The current condition differs from its natural limits as a result of man-made manipulation immediately downstream of the CSP area. Field leveling and re-channelization associated with past farming activities has resulted in the placement of fill materials within the historical flood plain. This past work resulted in a broadening the floodplain limits. The current floodplain as shown in Figure 4.13-3, Floodplain Map, has a depth that is generally less then one-foot in depth.

Surface Water Quality

Surface water quality in the project area can generally be predicted based on the by surrounding land uses. Most of the project area has been agricultural, primarily for grazing and pasture. Typical constituents in runoff from pasture lands would include nitrogen, phosphorus, and coliform bacteria. Runoff upstream of the project site would be expected to contain urban pollutants such as oil, grease, metals, nitrogen, and phosphorus from fertilizers, pesticides and herbicides, bacteria, and sediment.

FIGURE 4.13-3

FLOODPLAIN MAP

"BASE FLOOD ELEVATIONS"

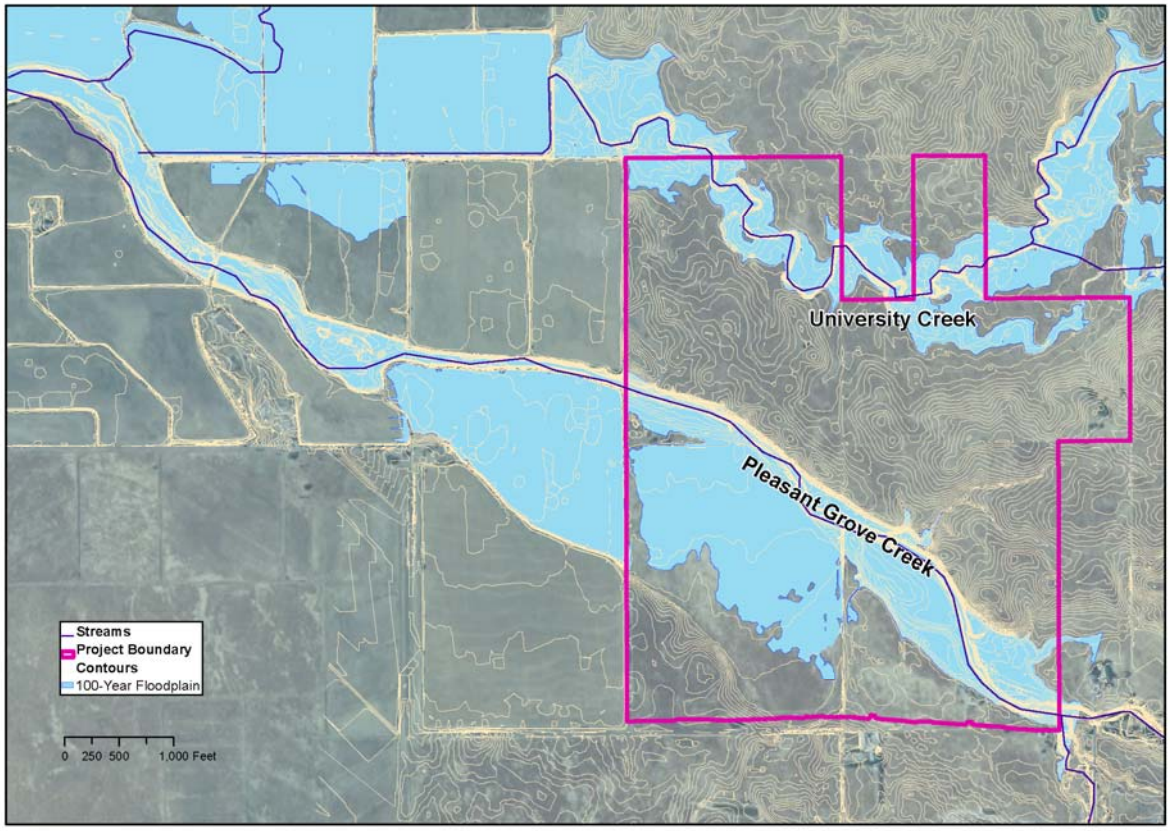


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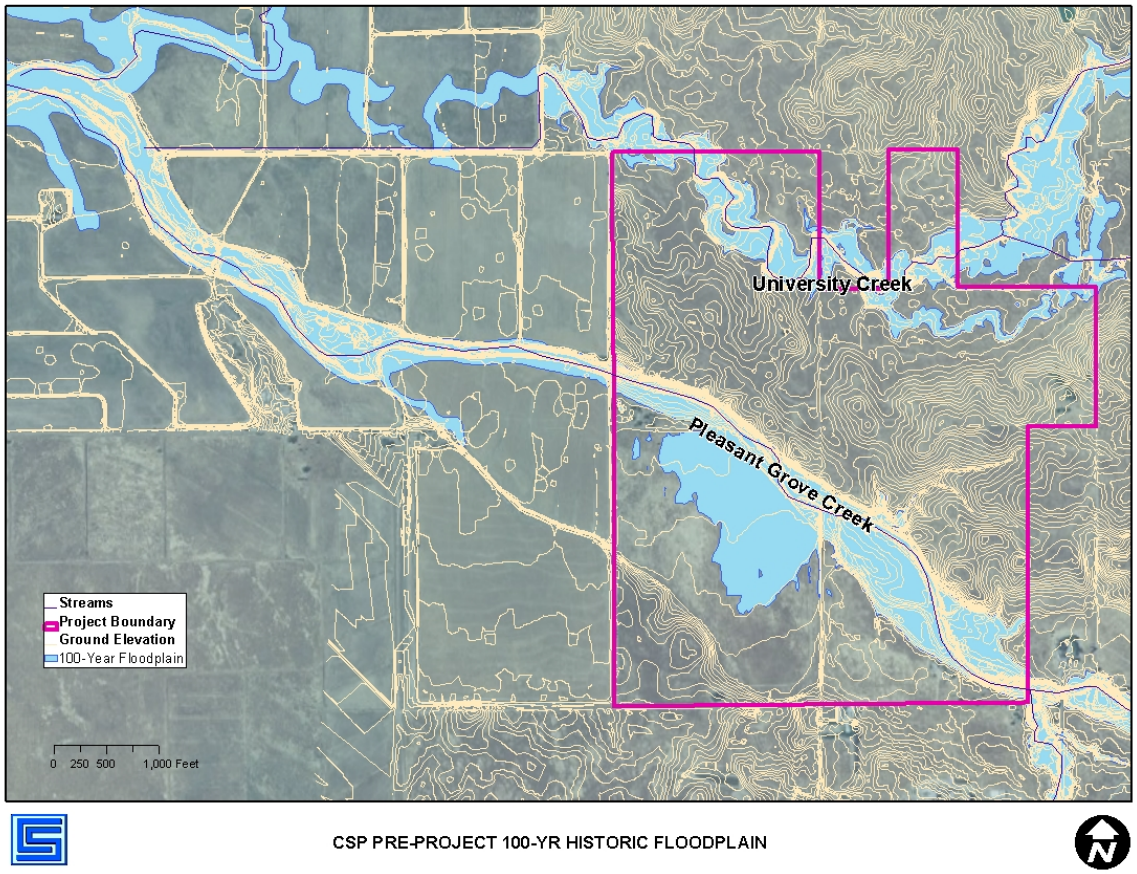
FIGURE 4.13-4

HISTORIC FLOODPLAIN MAP



The City has a stormwater program that complies with adopted stormwater quality regulations.

According to a report prepared for the Placer County Planning Department (foothill Associates 2006), water quality in Pleasant Grove Creek is relatively high. The water is warmer than expected, however, and has moderately high total coliform counts, but it otherwise meets the standards of the Basin Plan (California Regional Water Quality Control Board 1998).

Pleasant Grove Creek will receive additional flow as a result of the proposed Project. Wastewater will be conveyed south to the PGWWTP for processing. Treated tertiary effluent from the PGWWTP discharges directly to a segment of Pleasant Grove Creek within the WRSP area, just southeast of the project site. The PGWWTP outfall to Pleasant Grove Creek is located east of the treatment plant in an area designated as open space in the WRSP as shown on Figure 4.13-5.

In accordance with state requirements, surface water quality samples are collected 200 feet upstream and 200 feet downstream of the PGWWTP outfall. Water samples are collected on a weekly basis and analyzed for the parameters shown in Table 4.13-1. Table 4.13-1 shows the minimum and maximum results from sampling since the PGWWTP began operations in 2004.

TABLE 4.13-1
PLEASANT GROVE CREEK WATER QUALITY DATA

Location		Constituent			
		pH (SU	Dissolved Oxygen (mg/L)	Turbidity (ntu)	Temperature (Deg F)
Upstream (1)					
	Minimum	6.6	3	1	32
	Maximum	9.0	15	35	91
	Average	7.5	8	8	61
Downstream (2)					
	Minimum	6.5	4	1	32
	Maximum	8.5	14	32	83
	Average	7.5	9	5	67

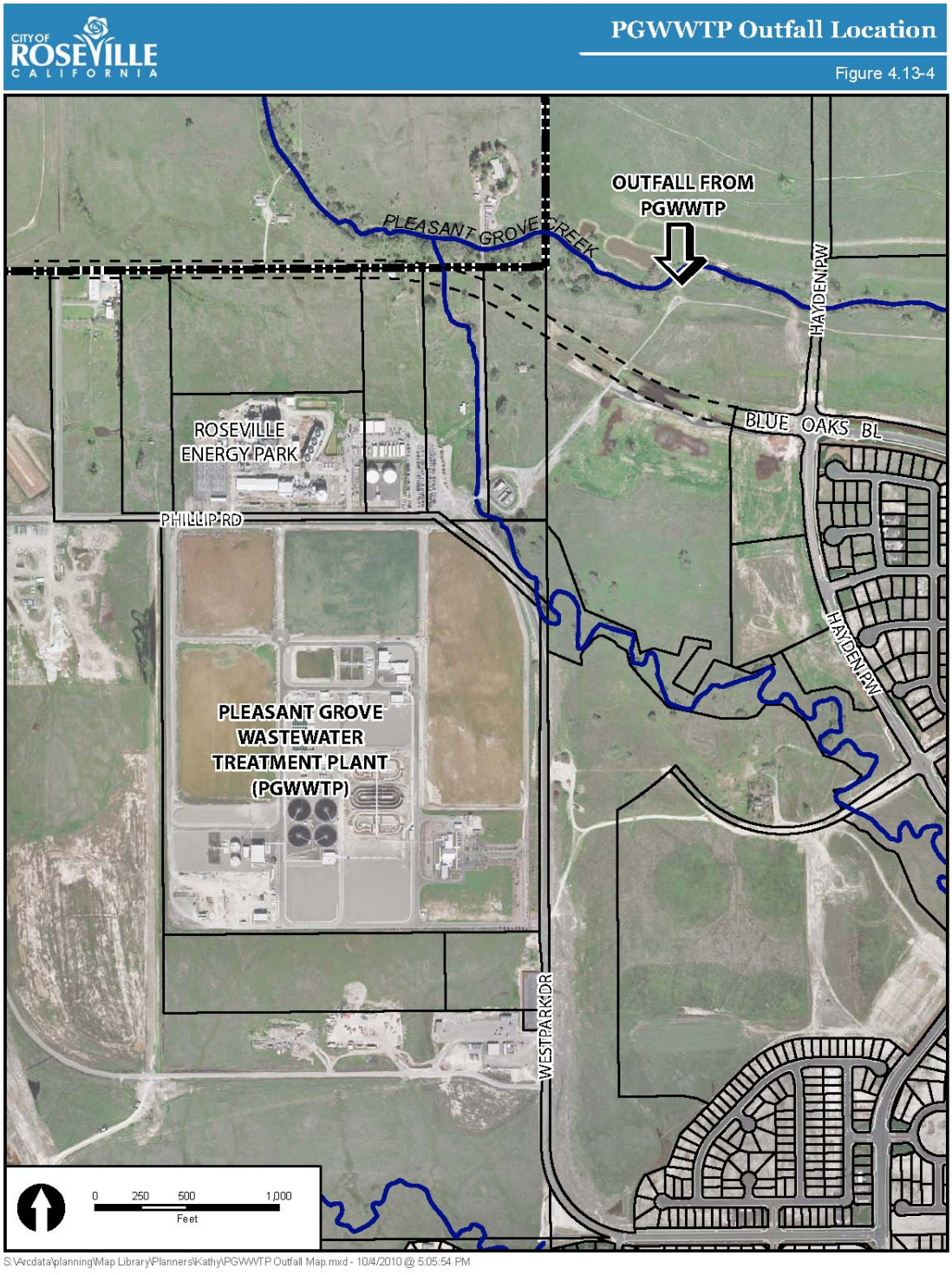
(1) 200 feet upstream of PGWWTP discharge outfall

(2) 200 feet downstream of PGWWTP discharge outfall

Source: Civil Engineering Solutions

FIGURE 4.13-5

LOCATION OF PGWWTP OUTFALL



4.13.3 REGULATORY SETTING

Federal

Floodplain Development

FEMA determines floodplain boundaries for purposes of flood insurance requirements, and distributes Flood Insurance Rate Maps (FIRM), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas within the 100-year floodplain, and in some cases also identify a regulatory floodway; however, no floodway has been identified in this project.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within the flood hazard areas depending on the potential for flooding within each area.

Federal Executive Order No. 119888 directs federal agencies to avoid development within a floodplain. Specifically, if an agency has determined or proposes to conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative, consistent with the law and with the policy set forth in the Executive Order, requires siting in a floodplain, prior to taking action the agency shall (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of the Executive Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain

The proposed CSP would meet the floodway encroachment "No Adverse Impact" (NAI) requirements and the City's Construction Standards. NAI is a concept developed by the Association of State Floodplain Managers that includes principles to ensure that floodplain management is consistent with its guidelines.

Water Quality

Section 303 of the federal Clean Water Act (CWA) requires states to adopt water quality standards for all surface water of the United States. Where multiple uses exist, water quality standards must protect the most sensitive use.

Title 40 of the Code of Federal Regulations (40 CFR) contains U.S. Environmental Protection Agency (EPA) regulations to implement the National Pollutant Discharge Elimination System (NPDES) permit system, which was established by the 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 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.

State

Urban Water Quality

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) are responsible for ensuring implementation and compliance with the provisions of the CWA, Porter-Cologne Water Quality Control Act, and NPDES programs. Along with the SWRCB and RWQCB, water quality protection is the responsibility of numerous water supply and wastewater management agencies as well as city and county governments.

The Project area is located within the jurisdiction of the Central Valley Region of the RWQCB (Region 5). The Central Valley RWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. Water quality objectives for the Sacramento River and its tributaries (e.g., Pleasant Grove Creek and Pleasant Grove Creek) are specified in the Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin (Basin Plan) prepared by the RWQCB in compliance with the federal CWA and the State Porter Cologne Act. The Basin Plan establishes water quality objectives and implementation programs to meet stated objectives and to protect the beneficial uses of water in the Sacramento-San Joaquin River Basin. Because the City of Roseville is located within the Central Valley RWQCB's jurisdiction, all discharges to surface water or groundwater are subject to the Basin Plan requirements.

On January 20, 2005, the State Water Resources Control Board adopted sustainability as a core value for all RWQCB activities and programs, and directed RWQCB staff to consider sustainability in all future policies, guidelines, and regulatory actions.

Low Impact Development (LID) is a sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional urban stormwater management, which collects untreated stormwater through drain inlets and conveys runoff directly and quickly through storm drain pipes or other conveyances to streams and creeks, LID uses site design and stormwater management concepts that maintain the site's pre-development runoff rates and volumes. The goal of LID is to infiltrate, filter, store, evaporate, and detain runoff close to its source, which contributes to the effect of mimicking a site's predevelopment hydrology and helps maintain the predevelopment hydraulics of the receiving waters. LID has been a proven approach in other parts of the country, and is seen in California as an improvement over conventional stormwater management. The RWQCBs are promoting the use of LID principles throughout California in various ways.

Construction Site Runoff Management

On September 2, 2009, the State Water Resources Control Board adopted Order 2009 0009-DWQ, State Water Resources Control Board NPDES General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities ("General Permit"), superseding Order 99-08-DWQ and establishing new requirements for storm water discharges from construction activities. The new General Permit took effect on July 1, 2010, and applies to site disturbance as small as one acre, as described below.

Under the General Permit, any construction activity affecting one or more acres of land, or any activity that is part of a common plan of development or sale that disturbs one acre or more, as well as construction activities for linear overhead/underground utility projects that result in disturbance of one acre or more, must obtain a General Construction Activity Stormwater Permit Waste Discharge Identification Number.

The September 2009 General Permit implements substantial changes from the prior permitting system, including risk-based assessments and numeric effluent limitations for projects covered under the General Permit. The Permit also imposes effluent monitoring and reporting requirements.

Urban Runoff Management

The 1987 amendments to the Clean Water Act (CWA) added Section 402(p), which requires the U.S. Environmental Protection Agency (EPA) to develop a comprehensive phased program to regulate storm water quality discharges under the National Pollutant Discharge Elimination System (NPDES) program. In November of 1990, Phase I of the NPDES program was issued addressing storm water discharges from municipal separate storm sewer systems (MS4s) serving populations over 100,000 and industrial activities including discharges from construction activities disturbing five acres or more. On December 8, 1999, the EPA published the NPDES Phase II regulations in the Federal Register as required by Section 402(p) of the CWA. NPDES Phase II regulations require small MS4s, those serving a population of less than 100,000 (at the time the amendments were finalized) and located in an urbanized area to obtain a municipal storm water permit.

As a Phase II community, the City of Roseville is currently required to operate under an NPDES Municipal Stormwater Permit administered by the State of California. The City of Roseville's Stormwater Management Plan was adopted and approved by the RWQCB in March 2003, at which time the City received a Phase II Stormwater Permit. The State Water Resources Control Board is currently updating the General Phase II permit requirements, which are expected to be more in line with the current Phase I requirements. Upon the adoption of the updated General Phase II Permit by the State, the City will update its Stormwater Permit to comply with the new requirements.

Local

City of Roseville Stormwater Management Plan

The City's SWMP dated March 2003 contains a comprehensive set of priorities, activities, and strategies that comprise the City's minimum control measures and best management practices (BMPs) intended to address Phase II requirements, described in the prior subsection. The goal is to reduce pollutants in stormwater to the maximum extent practicable. The SWMP was prepared with input by a Citizen's Advisory Committee.

The SWMP identifies activities to implement the following six minimum control measures required under the General Permit: public outreach, public involvement, illicit discharge detection and

elimination, construction site runoff, new development and redevelopment, and municipal operations.

The SWMP includes minimum required control measures for new development, such as structural and non-structural control strategies, and long-term operation and maintenance of controls. It includes specific guidance for volume and flow control design parameters for structural controls such as detention ponds, vegetative areas, and runoff pretreatment.

The City adopted the "Urban Stormwater Quality Management and Discharge Control Ordinance" (Stormwater Ordinance)(Ord. 4395 § 2 (part), 2006.) in order to establish a regulatory frame work to implement construction and post-construction stormwater controls. In March 2007, the City adopted the Stormwater BMP Guidance Manual for Construction, and in May 2007, the City adopted the Stormwater Quality Design manual. The City has the authority during plan checks, as well as site inspections, to enforce the Storwmater Management Plan. Prior to final approval, the owner of any stormwater control structure will be required to submit an operations and maintenance manual and a proposed maintenance schedule. Additional detail on post-construction controls is provided in the SWMP, which is available on the City's website (www.roseville.ca.us).

City of Roseville General Plan

The General Plan includes several policies relating to hydrology and water quality.

> **Goal 1:** Minimize the potential for loss of life and property due to flooding.
>
> **Goal 2:** Pursue flood control solutions that are cost-effective and minimize environmental impacts.
>
> **Policy 1:** Continue to regulate, through land use, zoning and other restrictions, all uses and development n areas subject to potential flooding.
>
> **Policy 2:** Monitor and regularly update City flood studies, modeling and associated land use, zoning and other development regulations.
>
> **Policy 3:** Continue to pursue a regional approach to flood issues.
>
> **Policy 4:** Minimize the potential for flood damage to public and emergency facilities, utilities, roadways and other infrastructure.

Policy 5: Require new developments to provide mitigation to insure that the cumulative rate of peak run-off is maintained at pre-development levels.

Policy 6: Continue to implement the Storm Maintenance Program to keep creeks and storm drain systems free of debris.

Policy 7: Establish flood control assessment districts or consider other funding mechanisms to mitigate flooding impacts.

Policy 8: Where feasible, maintain natural stream courses and adjacent habitat and combine flood control, recreation, water quality, and open space functions.

Creekview Specific Plan

The CSP designates creek corridors and their associated floodplains as wetland creation areas and open space. Peak flow stormwater impacts for the 100-year, 24-hour storm events will be contained within the proposed bypass channel within the Pleasant Grove Creek open space corridors. All drainage facilities will be designed and constructed in conformance with the City's Improvement Standards, the City's Stormwater Quality Design Manual, the Placer County Flood Control and Water Conservation District (PCFCWCD) Stormwater Management Manual and the Open Space Operations and Maintenance Plan (required under the Clean Water Act 404 Permit).

The CSP indicates that various LID options may include, but are not limited to, the following:

- Disconnected roof drains;
- Disconnected and separated pavement;
- Bioretention facilities, rain gardens, and bioswales;
- Tree planting;
- Grass swales and channels;
- Curb cuts and vegetated filter strips;
- Impervious surface reduction – permeable pavements and porous pavements;
- Stream buffers;
- Soil amendments; or
- Pollution prevention and good housekeeping practices.

City of Roseville Development Standards

The City maintains policies and guidelines regarding grading, erosion control, inspection, and permitting. Section 16.20.040 of the Roseville Municipal Code regulates stockpiling and grading, and addresses conditions under which permits and grading plans are required. Section 16.20.070 identifies grading plan performance standards.

A grading plan shall comply with the following criteria:

A. Fill or cut slopes with a height exceeding five feet shall not exceed a slope of 4:1.

B. When grading around native oak trees:

   1. Cut or fill slopes exceeding two feet in height shall not be permitted within a distance of 1.5 times the radius of the tree's protected zone.

   2. The grade shall not be raised or lowered around more than 50 percent of the protected zone; and

   3. The grading shall not change the drainage pattern within a distance of 1.5 times the radius of the tree's protected zone.

Section 16.20.020 requires that all grading be performed in accordance with either City of Roseville Improvement Standards or Chapter 16 of the Zoning Ordinance, whichever is more restrictive. The Public Works Department requires that a grading permit be obtained prior to grading activities. At that time, the Applicant must submit, for review and approval, Improvement and/or Grading Plans along with a site-specific Stormwater Pollution Prevention Plan (SWPPP). Slopes or banks along creek channels must be designed with proper slope protection to prevent soil erosion and channel-bank undercutting. The City has also adopted standards that would apply to projects within public rights-of-way or easements.

Section 10 of the City Improvement Standards identifies hydrologic and hydraulic methods to determine peak flow rates and criteria for identifying appropriate design and capacity for storm drainage infrastructure. Design criteria include requirements for channels and outfall design, cross culverts, inlet and outlet structures, and piping materials.

City of Roseville Floodplain Development

To prevent flooding conditions and to limit exposure of residents and structures to potential harm and/or damage, the City of Roseville General Plan (Safety Element/Flood Protection) contains policies that restrict land uses and development within the 100-year floodplain. For specific plans:

> *No development is permitted within the future floodplain (floodway and floodway fringe). Exceptions may be considered by the City on a case-by-case basis if encroachment is limited to only the future floodway fringe and would not result in <u>any</u> off-site increase in the water surface elevation.*

Chapter 9.80 of the Roseville Municipal Code identifies floodplain development criteria and restrictions that implement FEMA requirements. Section 10, of the City's Improvement Standards, also identifies criteria for development within the 100-year floodplain.

Placer County Flood Control and Water Conservation District (PCFCWCD)

The PCFCWCD was created by Senate Bill 1312, effective August 23, 1984. The PCFCWCD formulates regional strategies for flood control management. In 1990, the PCFCWCD developed a Stormwater Management Manual (SWMM) that presents policy, guidelines, and specific criteria for evaluating hydrologic and hydraulic conditions associated with new development within the context of regional stormwater issues. The City references the SWMM criteria in Section 10 (Drainage) of the City's Improvement Standards.

The SWMM contains specific principles and policies for the design of storm drain facilities:

A. Storm drainage planning, design and construction will avoid increasing the storm drainage problems in any area, or transferring drainage problems from one location to another. Watershed boundaries shall not be altered, and flows shall not be diverted from one watershed to another without compelling reasons.

B. Storm drains should use the natural drainage channel alignments whenever possible.

C. Development plans shall provide a secondary surface flow escape paths for flows in excess of the capacity of the primary piped or channelized drainage system without damage to structures.

D. Storm drainage planning and design shall be consistent with the flood boundaries and floodways delineated and regulated by the National Flood Insurance Program or other studies, such as watershed master plans.

E. Public Storm drainage facilities shall normally be located within public road right-of-way, unless specifically approved by the local jurisdiction and shall be designed as permanent facilities with minimal maintenance costs.

F. The points at which drainage enter and exit a project shall be at the same vertical and horizontal location as exists before the project except by written and recorded agreement between adjacent landowners in the form of an easement.

G. Fill or structures shall not be permitted to block drainage paths even if these paths function only in storms of rare occurrence.

H. Storm drainage systems shall incorporate best management practices for the protection of water quality when required by the local jurisdiction.

4.13.4 IMPACTS

Methods of Analysis

For purposes of the drainage analysis, the base flood elevations were evaluated in a 2-dimensional unsteady state model for the entire Pleasant Grove Creek watershed. The CSP portion of the project site is the area with the proposed land uses shown in Figure 2-4, *Land Use Plan*.

Drainage and Flooding

Technical data to support the analysis of potential drainage and flooding impacts of the proposed project were developed by Civil Engineering Solutions and presented in the Creekview Specific Plan Drainage and Stormwater Master Plan (2010) found in Appendix M.

Stormwater Peak Flows

Master watershed modeling for Pleasant Grove Creek was adapted from the original "Cross Canal Watershed Study" models of 1992 by several other projects including: the Regional University

Specific Plan, Placer Vineyards Specific Plan, and West Roseville Specific Plan. The Regional University Specific Plan comprehensive model, which covers the CSP Plan area, is used as the base analysis model for this EIR. Detailed hydraulic analysis of the pre-project and post-project conditions were prepared for Pleasant Grove Creek and the tributaries that will remain in their existing state after the proposed Project is built. A HEC-1 analysis along with unsteady state hydraulic modeling was prepared to determine the 100-year and 10-year storm events.

Stormwater Runoff Water Quality

The analysis of potential water quality effects was based on a qualitative comparison of pre-development and post-development land uses.

Surface Water Quality

The analysis of potential surface water quality effects on Pleasant Grove Creek as a result of increase tertiary treated effluent discharges from the PGWWTP are analyzed in Section 4.12.3, Wastewater, Impact 4.12-8. This analysis concludes that the impact is less-than-significant.

Thresholds of Significance

For purposes of this EIR, a significant impact would occur if development proposed in the project would do any of the following:

- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Expose people, housing or other structures to flood hazards by placing them in an area subject to inundation within the 100-year floodplain as defined by FEMA or the City's regulatory floodplain as defined by site-specific floodplain maps.
- Place within a 100-year flood hazard area structures 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 dam or levee.

- Substantially degrade surface water quality due to increases in sediments, erosion and urban contaminants generated by construction and/or operational activities or violate any water quality standards or waste discharge requirements.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or siltation on-or off-site.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.

Groundwater impacts are analyzed in Chapter 4.11-1 Water. Impacts from tsunamis and seiches were screened out of the analysis and will not be discussed further, because the Project area is not located near a water body or other feature that would pose any of these risks.

IMPACT 4.13-1	**CHANGES IN THE RATE OF STORMWATER RUNOFF AND ON-SITE CONVEYANCE THROUGH THE DEVELOPMENT OF NEW IMPERVIOUS SURFACES**	
Applicable Policies and Regulations	City of Roseville Improvement Standards Placer County Stormwater Management Manual	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Less Than Significant	Significant
Mitigation Measures:	None Required	WMM 4.12-1 Prepare Site Specific Drainage Study
Significance after Mitigation:	Less Than Significant	Less Than Significant

CREEKVIEW SPECIFIC PLAN

The CSP area is undeveloped at present. Development of residential, commercial, schools, parks and associated uses pursuant to the proposed CSP would increase the amount of impervious

surfaces on approximately 325 acres of the site compared to present conditions[3]. This increase in impervious surfaces would increase the rate of surface runoff conveyed through the site and into Pleasant Grove Creek. In addition, development and grading would alter the existing runoff patterns and conveyance capacities on the properties.

Results of hydrologic and hydraulic modeling were used to identify appropriate drainage facilities in the CSP to manage stormwater peak flows in accordance with City Improvement Standards and Placer County Stormwater Management Manual requirements.

Increased stormwater flows and altered drainage patterns as a result of development of the CSP could increase the potential for localized flooding within the developed CSP area. Potential risks from localized flooding could result in property loss and disruptions of transportation corridors that would disrupt essential services into, out of and through the plan area.

Consistent with *Section 10* of the *City of Roseville Design Standards*, the *Creekview Specific Plan Drainage and Stormwater Master Plan* provides a preliminary analysis of the on-site storm drain conveyance system that would be constructed to ensure the safe conveyance of storm water flows through the plan area and into the creek system. Consistent with the City's design standards, additional considerations would be made for the safe conveyance and overland flow release of the 100-year storm event assuming a total blockage of the storm drain system. Prior to acceptance and issuance of construction documents, the final design for the storm drainage infrastructure and overland conveyance system would be reviewed by the City's Engineering Department to ensure it complies with the City Improvement Standards and the *Creekview Specific Plan Drainage and Stormwater Master Plan*. Consistency with City standards would result in a **less than significant** impact.

URBAN RESERVE

Stormwater from future development of the Urban Reserve area would be conveyed to Pleasant Grove Creek. The development of the Urban Reserve would increase the amount of impervious

[3] The 501 acre specific plan minus 136 acres that would remain as open space as part of the project and excluding the 40-acre Urban Reserve.

surfaces compared to the present condition by approximately 32 acres[4]. This increase in impervious surfaces would increase the rate of surface runoff conveyed through the site and into Pleasant Grove Creek. In addition, development and grading would alter the existing runoff patterns and conveyance capacities on the properties.

This could have a **significant** impact on the Urban Reserve properties by increasing flows and altering drainage patterns that could result in localized flooding.

Previously adopted WMM 4.12-1 *Prepare Site Specific Drainage Study,* identified in the WRSP EIR, requires that when future uses within the Urban Reserve area have been more clearly defined, site specific hydrologic and hydraulic analyses would be preformed as required under City of Roseville General Plan Policy SB-6. Prior to issuance of building permits, the final design for infrastructure would be reviewed by the City's Public Works Department, Engineering Division to ensure that the development does not significantly increase stormwater runoff. With mitigation, this would be a **less than significant** impact.

IMPACT 4.13-2	**CHANGES IN THE RATE OF STORMWATER PEAK FLOWS ENTERING THE PLEASANT GROVE CREEK WATERSHED**	
Applicable Policies and Regulations	City of Roseville Improvement Standards Placer County Stormwater Management Manual	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Less Than Significant	Significant
Mitigation Measures:	None Required	WMM 4.12-1 Prepare Site Specific Drainage Study
Significance after Mitigation:	Less Than Significant	Less Than Significant

[4] Assumes approximately 8 acres would remain as open space as part of the Pleasant Grove Creek corridor.

CREEKVIEW SPECIFIC PLAN

The CSP area is undeveloped at present. Development of residential, commercial, schools, parks and associated uses pursuant to the proposed CSP would increase the amount of impervious surfaces on approximately 325 acres of the site compared to present conditions. This increase in impervious surfaces would increase the rate of surface runoff entering Pleasant Grove Creek.

Increased storm water flows as a result of development of the CSP could increase the potential for localized and regional flooding downstream of the CSP area. Pleasant Grove Creek flows to the Pleasant Grove Canal then to the Natomas Cross Canal and then drains to the Sacramento River. At present, during large storm events, water in Pleasant Grove Creek downstream from the CSP project site overflows its banks, flooding homes and ranches. The flood waters also run through the "Sankey Gap" into the Sutter County portion of the Natomas Basin in the vicinity of the Sutter Pointe Specific Plan area.

Consistent with General Plan Policy SB-6 and PCFCD SWMM standards, peak flow runoff rates were determined for the CSP to identify drainage features that would be necessary to mitigate post development flows. Pre-project and post-development peak hydraulic grades for Pleasant Grove Creek are presented in Table 4.13-2.

TABLE 4.13-2

100-YEAR (& 10-YEAR) PEAK FLOW COMPARISON

Stream Station	Description	Pre-Project Peak Flow (cfs)	Post-Project Future, Fully Developed, Unmitigated Peak Flow (cfs)	Post-Project Mitigated Peak Flow (cfs)	Post –Project Mitigated Net Peak Flow Reduction (cfs)
Pleasant Grove Creek – Main Channel					
172.3025	Upstream of Project	5252 (2630)	5623 (2982)	5247 (2627)	-5 (-3)
143.935	Upstream of Roadway Crossing (Combined)	5298 (2577)	5611 (2968)	5216 (2615)	-82 (38)
117.989	Downstream Project Boundary (Combined)	5254 (2630)	5617 (2965)	5166 (2609)	-88 (-21)
94.2499	Bypass Channel Return	5034 (2653)	5605 (2958)	5065 (2593)	31 (-60)
69.787	Junction with University Creek	5013 (2666)	5603 (3004)	5062 (2626)	49 (-44)
20.483	Reason Farms Return	5238 (2871)	6055 (3265)	5342 (2840)	104 (-31)
University Creek					
56	Upstream of Project Flows	709 (235)	809 (313)	616 (201)	-93 (-34)
43	Leaving Project at North Boundary	675 (225)	834 (339)	667 (219)	-8 (-6)
38	Downstream of Project	654 (205)	782 (291)	649 (201)	-5 (-4)

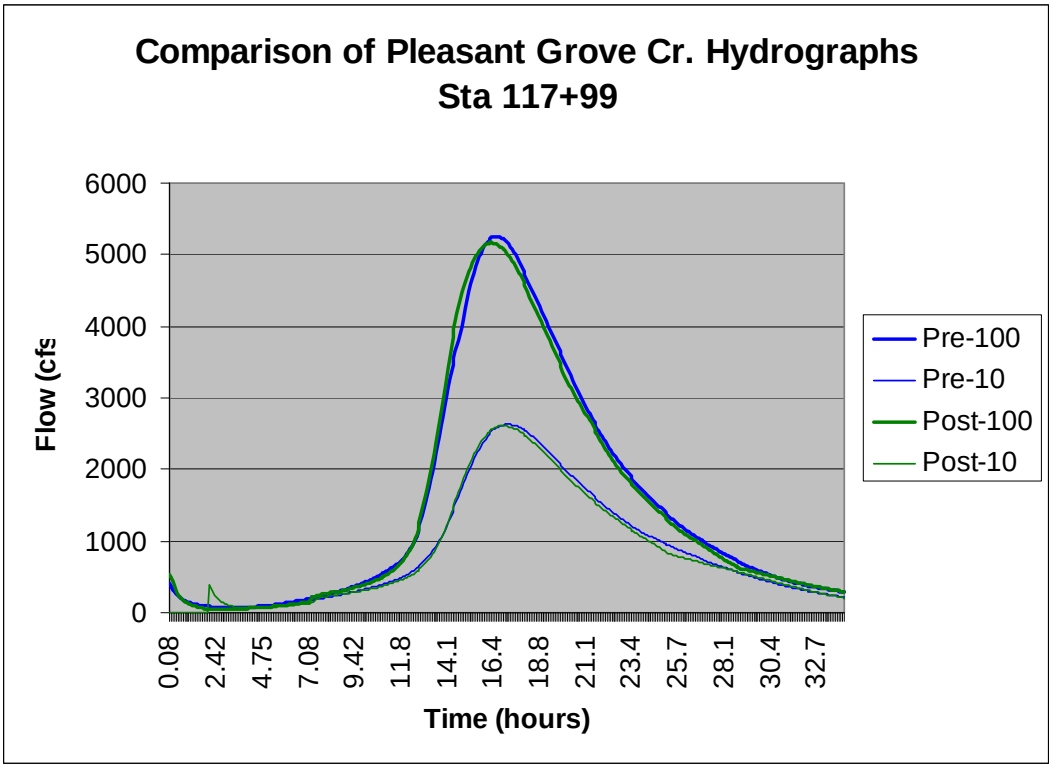
Results of hydrologic and hydraulic modeling were used to identify appropriate drainage facilities in the CSP to manage stormwater peak flows in accordance with City Improvement Standards and Placer County Stormwater Management Manual requirements.

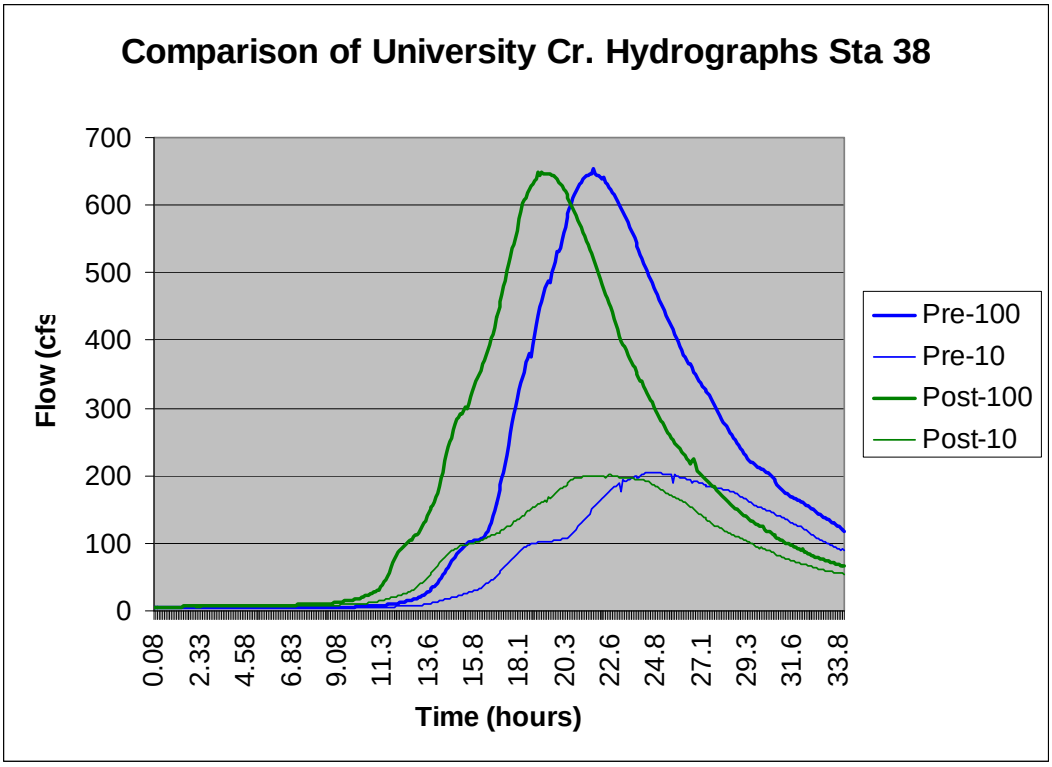
Downstream peak flows will be mitigated with the implementation of several engineering solutions. As shown in the *Creekview Specific Plan Drainage and Stormwater Master Plan,* the use of Low Impact Development (LID) strategies will reduce the amount of runoff by providing opportunity to allow stromwaters to infiltrate into the ground. This natural infiltration allows the

post development hydrograph to more naturally match the pre-project hydrograph, as shown in Figure 4.13-6.

FIGURE 4.13-6

PRE AND POST HYDROGRAPH COMPARISONS

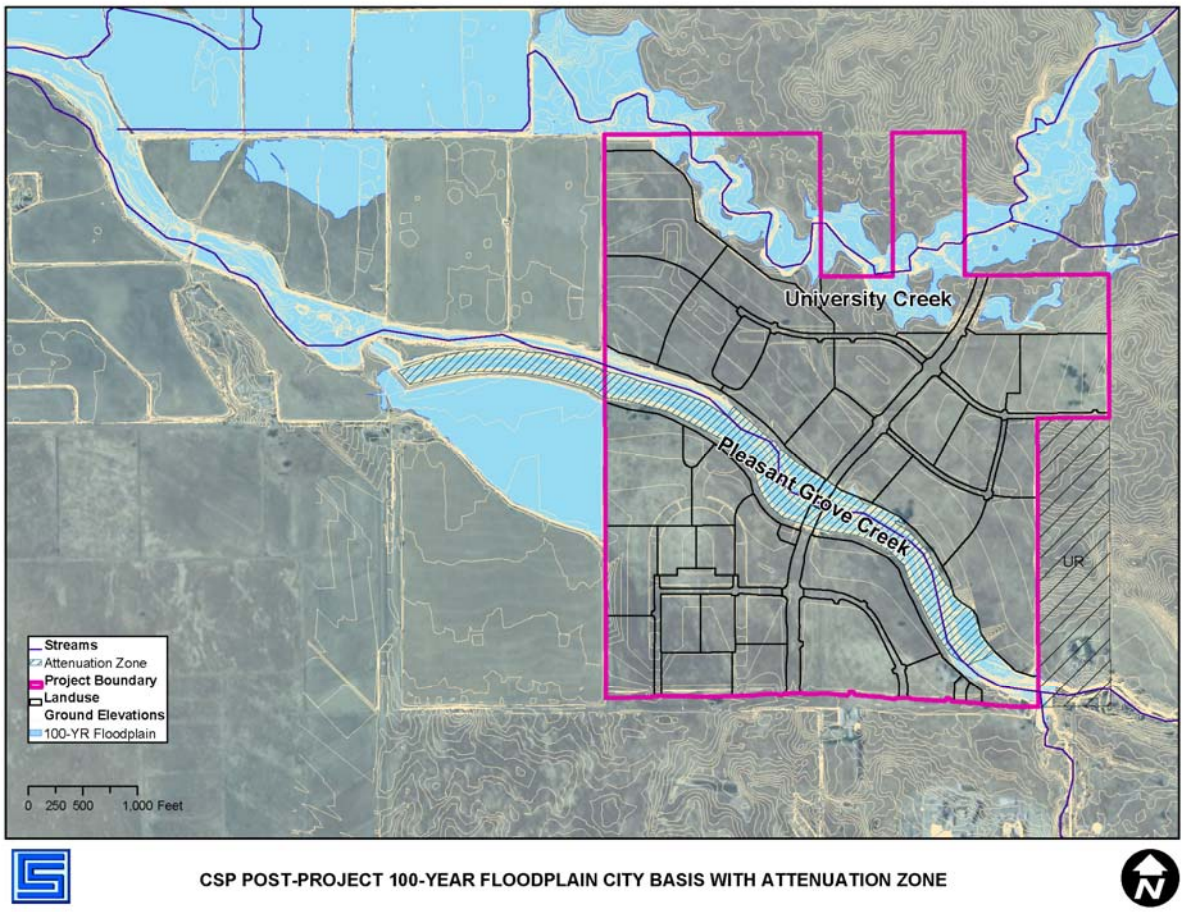




Where this absorption rate is not enough to off-set the peak 100-year storm events, in-stream detention will be provided. As shown in Figure 4.13-7 stormwater detention improvements are proposed that would provide in-stream detention storage for the 100-year event.

FIGURE 4.13-7

INSTREAM 100-YEAR DETENTION



The project includes the construction of in-stream stormwater detention improvements as identified in the *Creekview Specific Plan Drainage and Stormwater Master Plan* (Appendix M). By constricting flows through the western bicycle/pedestrian bridge structure, which has two separate spans across each of the bypass channel and the existing Pleasant Grove Creek channel, and at the outlet weir of the bypass channel. The incremental difference between the existing 100-year peak flow and the fully developed 100-year peak flow would be throttled so that the post development downstream Hydraulic Grade Line (HGL) flood level would be equal to the pre-development 100-year HGL flood level. The inclusion of these detention facilities would maintain the pre-development hydraulic grade lines downstream of the project site.

The applicant will be required to secure appropriate permits from the regulatory agencies, such as a USACE 404 permit or California Fish and Game Code Section 1602 stream alteration permit, as required. These permits are described in Section 4.8, Vegetation and Wildlife. Prior to issuance of building permits, the final design for the storm drainage infrastructure and the in-stream detention improvements would be reviewed by the City's Engineering Department to ensure it complies with the City Improvement Standards and the *Creekview Specific Plan Drainage and Stormwater Master* Plan, December 2010.

In summary, the peak flow and HGL comparisons indicate that the proposed in-stream detention described above for Pleasant Grove Creek would provide the required peak flow mitigation beyond the SWMM requirements and no increase in localized or regional flows would occur. As CSP land uses are developed, specific data for detention requirements would be further refined, consistent with SWMM, the City of Roseville standards, and the *Creekview Specific Plan Drainage and Stormwater Master Plan*. Therefore, impacts of the CSP on storm water peak flows would be **less than significant.**

URBAN RESERVE

Stormwater from future development of the Urban Reserve area would be conveyed to Pleasant Grove Creek. This could have a **significant** impact by increasing flows in Pleasant Grove Creek.

Previously adopted WMM 4.12-1 *Prepare Site Specific Drainage Study*, identified in the WRSP EIR, requires that when future uses within the Urban Reserve area have been more clearly defined, site specific hydrologic and hydraulic analyses would be preformed as required under City of Roseville General Plan Policy SB-6. Prior to issuance of building permits, the final design for infrastructure would be reviewed by the City's Public Works Department, Engineering Division to ensure that the development does not significantly increase stormwater runoff. With mitigation, this would be a **less than significant** impact.

IMPACT 4.13-3	INCREASE IN THE AMOUNT OF SURFACE RUNOFF VOLUME, WHICH WOULD EXCEED THE CAPACITY OF EXISTING STORM DRAINAGE SYSTEMS AND INCREASE THE POTENTIAL FOR DOWNSTREAM FLOODING	
Applicable Policies and Regulations	City's Regional Flood Control Program	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant
Mitigation Measures:	WMM 4.12-2 Pay Fair Share of Roseville Regional Stormwater Retention Facility Improvements.	WMM 4.12-2 Pay Fair Share of Roseville Regional Stormwater Retention Facility Improvements. WMM 4.12-3 Retention Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

CREEKVIEW SPECIFIC PLAN

As discussed in Impact 4.13.-1, development of the CSP area would increase the impervious surfaces on approximately 325 acres of the site, which would cause additional stormwater runoff into Pleasant Grove Creek watershed compared to existing conditions. In addition, development and grading would alter the existing runoff patterns and conveyance capacities on the properties in the CSP area. This volume increase, when combined with the larger water sheds contributing to the Natomas Cross Canal watershed, has the potential to peak with the flood waters of the Sacramento River to cause flooding in Sutter County. Development of the CSP is estimated to generate an additional runoff volume of 44.2 acre feet over the 8-day 100-year storm model. The CSP contribution to the increase in volume of runoff in the Cross Canal Watershed would be **significant.**

The increase in runoff would be managed to minimize the risk of downstream flooding beyond the CSP boundaries in the Natomas Cross Canal Watershed. As discussed in the Subsection 4.12.2 Environmental Setting, the City of Roseville has approved a regional retention basin at Reason Farms. The Reason Farms Regional Stormwater Retention Facility is located northwest of the CSP Project area. The EIR for the Regional Stormwater facility was certified in 2003, and evaluated full buildout of the regional retention basin to 2,350 acre feet capacity, to which the CSP would

incrementally contribute. Upon construction, the regional retention basin project will include capacity for the CSP stormwater flows. The City is currently collecting drainage impact fees from new development projects to fund the construction of this project, which will be constructed as funds are made available, and is dependent upon development absorption rates. It is estimated the CSP could begin construction as early as 2014, at which time impact fees will be collected with the issuance of building permits.

Implementation of the previously adopted WMM 4.12-2, identified in the WRSP EIR, would ensure a mechanism for determining the CSP's proportionate contribution to development of the regional retention basin. Upon construction, the retention basin will be capable of retaining increased stormwater flows generated by the buildout of the CSP. Therefore, with mitigation the impact would be reduced to a **less than significant** level.

URBAN RESERVE

Future development of the Urban Reserve area would likely increase impermeable area and stormwater runoff. Without the completed Reason Farms Regional Retention facility, runoff at buildout of the Urban Reserve area could result in increased risk of flooding at downstream properties. This would be a **significant** impact.

Implementation of previously adopted WMM 4.12-2, identified in the WRSP EIR, would ensure a mechanism for determining the Urban Reserve's proportionate contribution to development of the regional retention basin.

Implementation of previously adopted WMM 4.12-3, *Retention Policies*, identified in the WSRP EIR, would continue to apply to the Urban Reserve area and requires that development in the Urban Reserve demonstrate by means of a study submitted to the City of Roseville Public Works Department that stormwater will be adequately accommodated in the Regional Retention Facility. If development in the Urban Reserve area requires the retention facility to be expanded, WMM 4.12-3 requires payment for the expansion through fair share contributions by future project development. Therefore, this impact is considered **less than significant** with mitigation.

IMPACT 4.13-4	PLACEMENT OF FILL OR STRUCTURES IN the 100-YEAR FLOODPLAIN COULD AFFECT WATER SURFACE ELEVATIONS, WHICH COULD INCREASE THE RISK OF FLOODING	
Applicable Policies and Regulations	FEMA (44 CFR 60) City Floodplain Development Regulations (Chapter 9.80, Roseville City Code)	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Less Than Significant	Significant
Mitigation Measures:	None Required	WMM 4.12-4 Floodplain Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

CREEKVIEW SPECIFIC PLAN

Pleasant Grove Creek and University Creek flow through the Project area. The 100-year floodplains for the Pleasant Grove and University Creeks are illustrated in Figure 4.13-3. As described above, the present 100-year floodplains within the CSP have been enlarged by downstream man-made constrictions as a result of past farming activities. The floodplain along Pleasant Grove Creek extends westward and onto the Reason Farms Offsite Improvement Area. The CSP proposes a creek restoration bypass channel along Pleasant Grove Creek. The enhanced bypass channel would be naturally contoured and would create additional riparian and wetland habitat and increase the capacity of the creek system to convey storm flows around the constriction, and provide peak flow detention within the channel and within the remaining floodplain on the Off-Site Improvement Area. The entire channel and its amenities will be within the Open Space parcels and be subject to the City's Operations and Maintenance protocol. West of the CSP property, the bypass channel will be routed around the existing constriction within the Off-Site Improvement Area. The hydraulic result of the bypass channel would be to reclaim the 100-year floodplain area from the southern portion of the CSP project site. The bypass channel also would be coordinated with the operations of the Reason Farms Regional Flood Control Project.

The development of the CSP will require the placement of fill on the south side of the Pleasant Grove Creek in those areas of reclaimed floodplain. Similar treatment will occur along the northwestern corner of the project site adjacent to University Creek, where an enhanced channel will be constructed to increase the capacity of the creek system. This channel will be within the Open Space parcel, similar to the bypass channel. Small amounts of additional fill could be used in small depressions in overbank areas to reduce the extent of the floodplain where uses other than open space or park would occur. Fill would also be placed as part of the construction of proposed roadway and bridge crossings, drainage culverts, and weir structures.

The construction of the bypass channel on Pleasant Grove Creek and placement of fill within the reclaimed floodplain would increase the conveyance capacity of Pleasant Grove Creek through the downstream constriction. The loss of on-site storage resulting from the placement of fill within the CSP will be off-set within the bypass channel and the remaining floodplain on the Off-Site Improvement Area. Water surface elevations within the CSP area will increase during the 100-year peak flow. The increases in water surface elevation of several inches are limited to within the CSP, and are not considered significant. They are accounted for with the City's freeboard requirements. The resulting floodplain elevations are shown on Table 4.13-3. Compliance with the City's Improvement Standards and 3-foot freeboard requirements will ensure that developable sites within the CSP area are above the floodplain elevation. Water surface elevations downstream of Reason Farms, outside the plan area would not be measurably affected. The modeled estimates of water surface elevation changes include a component that accounts for these fill improvements.

The construction of the enhanced channel on University Creek and placement of fill within the reclaimed floodplain would increase the conveyance capacity of University Creek through the plan area. Water surface elevations in the CSP area would increase by minor amounts during the 100-year event. These increases would be minimal, are within the tolerance of the HEC-RAS modeling, and are only located within the CSP area. The resulting flood plain elevations are shown on Table 4.13-3. Compliance with the City's Improvement Standards and freeboard requirements will assure that developable sites within the plan area are above the floodplain elevation. Water surface elevations outside the plan area would not be measurably affected. The modeled estimates of water surface elevation changes include a component that accounts for these fill improvements.

TABLE 4.13-3

PRE AND POST

WATER SURFACE ELEVATION (WSE) COMPARISON

Stream Station	Description	Pre-Project 100-year WSE	Post-Project 100-year WSE	Post –Project Mitigated Net Peak Flow Reduction (ft)
Pleasant Grove Creek				
172.3025	Upstream of Project	81.98	81.59	**-39**
143.935	Upstream of Roadway Crossing	80.16	79.86	**-30**
117.989	Bypass Channel-Upstream of Roadway Crossing	79.87	79.89	**0.2**
117.989	Downstream of Project Boundary	78.35	77.73	**-0.38**
117.989	Bypass Channel Return	77.59	78.27	**0.68**
94.24599	Bypass Channel Return	72.71	72.32	**-0.39**
69.787	Junction with University Creek	71.09	71.13	**0.04**
University Creek				
56	Upstream of Project Flows	84.02	83.81	**-0.21**
43	Leaving Project at North Boundary	78.65	78.65	**0.0**
38	Downstream of Project	78.52	78.51	**-0.01**
21	Upstream of Confluence with Pleasant Grove Creek	71.29	70.88	**-0.41**

TABLE 4.13-4

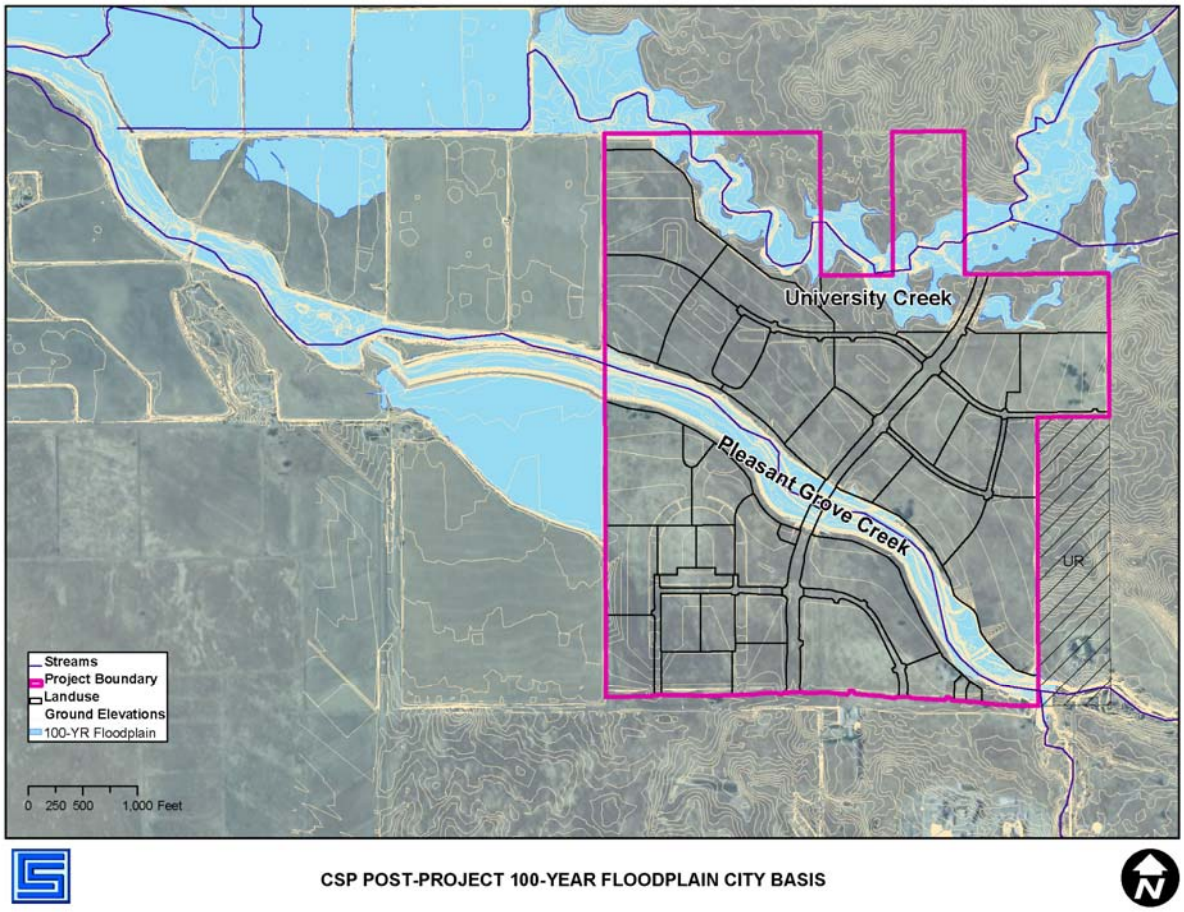
100-YEAR (& 10-YEAR) PEAK FLOW COMPARISON

Stream Station	Description	Pre-Project Peak Flow (cfs)	Post-Project Future, Fully Developed, Unmitigated Peak Flow (cfs)	Post-Project Mitigated Peak Flow (cfs)	Post –Project Mitigated Net Peak Flow Reduction (cfs)
Pleasant Grove Creek					
172.3025	Upstream of Project	5252 (2630)	5623 (2982)	5247 (2627)	-5 (-3)
143.935	Upstream of Roadway Crossing	5298 (2577)	5611 (2982)	5216 (2609)	-82 (38)
117.989	Downstream Project Boundary	5254 (2630)	5617 (2965)	5166 (2609)	-88 (-21)
94.24599	Bypass Channel Return	5034 (2653)	5605 (2958)	5065 (2593)	31 (-60)
69.787	Junction with University Creek	5013 (2666)	5603 (3004)	5062 (2626)	49 (-44)
20.483	Reason Farms Return	5238 (2871)	6055 (3265)	5342 (2840)	104 (-31)
University Creek					
56	UC-Upstream of Project flows	709 (235)	809 (313)	616 (201)	-93 (-34)
43	UC-Leaving Project at North Boundary	675 (225)	834 (339)	667 (219)	-8 (-6)
38	UC-Downstream of Project	654 (205)	782 (291)	649 (201)	-5 (-4)

Compliance with the City's Floodplain Development Regulations would mitigate any impacts associated with fill in the 100-year floodplain. A Letter of Map Revision (LOMR) for that portion of Pleasant Grove Creek regulated by FEMA will be submitted after the City of Roseville and Placer County Flood Control and Water Conservation District have reviewed the data. While the absolute boundary of the 10-year and 100-year floodplains could vary slightly from the elevations shown on detailed floodplain maps in the Master Drainage Study, as shown on Figure 4.13-8, placement of the fill would not increase water surface elevations beyond those estimated in the current HEC-RAS model.

FIGURE 4.13-8

POST PROJECT 100-YEAR FLOOD PLAIN



With the proposed improvements, no development would occur in the post-development 100-year floodplain; therefore, people and structures would not be exposed to 100-year flood hazard, and the CSP would not increase flood elevations beyond those already identified. Therefore, this is considered a **less than significant** impact.

URBAN RESERVE

Because the specific land uses and potential fill areas within the Urban Reserve parcel have not been identified at the same level of detail as the CSP, it is assumed that placement of fill or structures within the floodplain could result in a reduction of the capacity of Pleasant Grove Creek to handle flows. Floodplain encroachment could increase water surface elevations in the channel, which could, in turn, increase flood risk within the Urban Reserve area or downstream. This is considered a **significant** impact.

Previously adopted WMM 4.12-4 Floodplain Policies, identified in the WSRP EIR, would continue to apply to the Urban Reserve area and would reduce this impact to a **less than significant** level by ensuring that development in the Urban Reserve area does not occur in the 100-year floodplain or, if small amounts of fill are placed in the floodplain, that water surface elevations would not be measurably affected.

IMPACT 4.13-5	**EROSION AND RUNOFF FROM CONSTRUCTION SITES CONTAINING SOIL OR OTHER MATERIALS COULD DEGRADE WATER QUALITY IF DISCHARGED TO LOCAL STREAMS**	
Applicable Policies and Regulations	SWRCB NPDES Permit (State General Permit for Storm Water Discharges Associated With Construction and Land Disturbance Activities) Roseville Improvement Standards Sections 2 and 11 City of Roseville Stormwater BMP Guidance Manual for Construction	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant

Mitigation Measures:	MM 4.13-1 Implementation of Construction Activity Stormwater Protection Standards	MM 4.13-1 Implementation of Construction Activity Stormwater Standards; MM 4.13-2 Stormwater Management Development Standards; MM 4.13-3 Storm Water Quality Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

CREEKVIEW SPECIFIC PLAN

Development associated with the CSP would involve the construction of structures, roadways, parking lots, and infrastructure (including offsite infrastructure), which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. Sediment from erosion could have adverse effects on receiving water quality at the site and downstream, including Pleasant Grove Creek and eventually the Sacramento River. Such effects could include increased turbidity, which could result in adverse impacts on fish and wildlife and their habitat, reduced pump life at Sacramento River water intakes due to abrasion, increased municipal water treatment costs for turbidity removal, and impaired recreation and aesthetic values. Another potential source of water quality degradation during construction activities is heavy machinery and other construction equipment. Construction equipment spills could result in the release of polluting constituents, such as heavy metals, oil, grease, and other petroleum hydrocarbons to Pleasant Grove Creek and other onsite channels. This is a **significant** impact.

Project developers are required by state law to obtain coverage under the State General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit). Developers are also required by City ordinance (RMC Chapter 14.20) to fully comply with the State construction permit and reduce pollutants to the maximum extent practicable. Compliance with the General Permit requires a number of steps. The project developer must electronically file Permit Registration Documents before construction activity begins, including a Stormwater Pollution Prevention Plan (SWPPP), Notice of Intent, Site Map, and Risk Assessment.

The Site Map must include detailed information such as site layout; the location of sensitive habitats or watercourses, drainage areas, discharge locations, soil disturbance areas, and sampling locations; and the locations of all runoff, erosion control, and sediment control Best Management Practices (BMPs). The BMPs must address source control, pollutant control, and treatment control. Examples include straw wattles, dikes, silt fences, sediment traps, or similar methods. If construction occurs during the wet season, additional winterization improvements are required to stabilize the disturbed areas of the site, prevent erosion and clean discharge waters. A discharger may be required to develop a Rain Event Action Plan before the onset of a storm event.

A discharger must develop a Risk Assessment using the forms and procedures set forth in the General Permit (Appendix 1) to assess the risk level of a construction project. Risk assessment is based on (1) sediment transport, and (2) receiving water risk. The assessed Risk Level (1, 2, or 3) will determine the specific requirements applicable to that site.

Monitoring and reporting requirements for all sites under the General Permit include visual monitoring and maintaining records of storm water and non-storm water discharges. Risk Level 2 and 3 sites are required to monitor effluent water quality, and some Risk Level 3 sites must monitor receiving water for pH and turbidity. Bioassessment sampling is required for Risk Level 3 sites larger than 30 acres with direct discharges into receiving waters. All dischargers must prepare and submit an Annual Report.

Contractors will be required to prepare, and retain onsite, an Erosion Control Plan in accordance with Sections 2 and 11 of the City of Roseville's Improvement standards, as well as the SWPPP that was developed for the General Permit. As part of the City's Stormwater Management Program, the City actively inspects construction sites to ensure compliance with the State construction permit.

All dischargers must prepare and submit an Annual Report.

Implementation of MM 4.13-1 requires the creation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), and the use of Best Management Practices (BMPs) to minimize erosion and the risk of polluted runoff from construction sites. Further, compliance with the States General Construction Permit and City Improvement Standards, combined with the City's inspection efforts under its Stormwater Management Program, would ensure that construction-

related sediment or other contaminants would be reduced to the maximum extent practicable as required by law. As a result, the Project would not result in the violation of any water quality standards, would not create substantial additional sources of polluted runoff, and would not otherwise substantially degrade water quality. Therefore, this impact is considered to be **less than significant**.

URBAN RESERVE

Future development within the Urban Reserve area, including offsite infrastructure connections, would involve the construction of structures, roadways, parking lots, and infrastructure, which would require grading, excavation, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. Sediment from erosion could have adverse effects on receiving water quality at the site and downstream, including Pleasant Grove Creek and eventually the Sacramento River. Such effects could include increased turbidity, which could result in adverse impacts on fish and wildlife, habitat, reduced pump life at Sacramento River water intakes due to abrasion, increased municipal water treatment costs for turbidity removal, and impaired recreation and aesthetic values. Another potential source of water quality degradation during construction activities is heavy machinery and other construction equipment. Construction equipment spills could result in the release of polluting constituents, such as heavy metals, oil, grease, and other petroleum hydrocarbons to Pleasant Grove Creek and other onsite channels. This is considered a **significant** impact.

Implementation of MM 4.13-1, MM 4.13-2 and MM 4.13-3 would require that future development include low impact development (LID) standards to reduce water quality impacts. Further, compliance with the State General Construction Activity Permit and City Improvement Standards combined with the City's inspection efforts under its Stormwater Management Program would ensure that construction related sediment or other contaminants would be reduced to the maximum extent practicable as required by law. As a result, future development will not result in the violation of any water quality standards, will not create substantial additional sources of polluted runoff, and will not otherwise substantially degrade water quality. As such this impact is considered to be **less than significant**.

IMPACT 4.13-6	CHANGES IN SURFACE WATER QUALITY RESULTING FROM URBAN STORMWATER RUNOFF	
Applicable Policies and Regulations	NPDES Phase 2 Program Regulations (City of Roseville Stormwater Management Plan)	
	CSP	**Urban Reserve**
Significance with Policies and Regulations	Significant	Significant
Mitigation Measures:	MM 4.13-2 Stormwater Management Development Standards	MM 4.13-3 Storm Water Quality Policies
Significance after Mitigation:	Less Than Significant	Less Than Significant

CREEKVIEW SPECIFIC PLAN

Development associated with the proposed CSP would result in the conversion of undeveloped land to urban uses including residences, schools, businesses, recreation, roadways and parking areas. As discussed above, the increase in impervious surfaces resulting from the construction of buildings and paved areas would increase the rate and amount of stormwater runoff that would carry urban pollutants into Pleasant Grove Creek. It is anticipated that runoff from the CSP area would be typical of urban runoff water quality. Activities that could increase the types or quantities of non-naturally occurring pollutants in runoff due to development include:

- Motor vehicle operations
- Residential maintenance (e.g., landscape maintenance- mowing, blowers, fertilizing, pesticide use, car washing)
- Litter
- Careless material storage and handling
- Domestic animal and wildlife wastes
- Pavement wear

Pollutants typically associated with urban uses include oil and grease, coliform bacteria, petroleum hydrocarbons, nitrogen, phosphorus, heavy metals, pesticides, herbicides, and other constituents. Urban runoff studies throughout the U.S. have shown that the concentration of suspended solids usually decreases with urbanization as exposed soils are covered by impervious surfaces. Although some of the sediment load of developed areas would be reduced by implementing grassy swales, bio filters and other measures, sources of pollution to stormwater runoff may still be present due to entrained dust on roadways and parking lots and blow over from open space areas and/or other off-site farming and construction activities. There is the potential that urban runoff from the CSP could contain levels of pollutants that could adversely affect water quality in the local streams or increase sediment loads. Therefore, this impact is considered **significant**.

Consistent with current and anticipated NPDES Phase II stormwater requirements, the *Creekview Specific Plan Drainage and Stormwater Master Plan* identifies both source control LID strategies and treatment control water quality BMPs. LID concepts have been identified for the CSP that can be used to treat the first seasonal storm events, those storms of 0.5 inches of rain or less, sometimes referred to as "first flush" events.

Source Control and the use of Low Impact Development (LID) strategies are intended to mange pollution where it is first generated, keeping the pollutants from entering the stormwater in the first place. The goal in the use of LID strategies is to keep pollutants from contacting runoff and leaving a site, thereby protecting water quality. LID is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings. By integrating LID concepts into the fabric of a community, stormwater management is effective on several levels, the LID strategies minimize the effects of impervious surfaces by promoting infiltration of runoff through swales, vegetation, or mechanical systems, which aids in filtration of pollutants prior to entering surface and ground waters, and helps mimic the natural pre-development hydrograph. The result is a diminished amount of stormwater, both in the terms of volume and pollutant level, which otherwise would require further treatment.

The following LID and treatment control measures are identified in the *Creekview Specific Plan Drainage and Stormwater Master Plan* and are related to the development of different land uses.

These LID strategies may be implemented individually or in combinations as determined during project design. The following is a list of allowable LID measures that may be employed:

- **Disconnected roof drains**: Water runoff from roof systems would be treated by biological filtration. Provides opportunities for infiltration.
- **Pervious or partially paved driveways and porous pavement:** Pavement alternatives would allow the opportunity for infiltration of runoff.
- **Separated sidewalks**: Runoff would be treated before entering the gutter pan and storm drain system.
- **Tree planning and canopy preservation:** Limited trees are present within the plan area. The specific plan would ensure that trees are planted and maintained, which would in turn reduce the rate and amount of total runoff which would enter the storm drain.
- **Soil amendments in landscaped areas and stormwater planters:** The addition of organic material to impervious soils can add voids that can absorb runoff, thereby preventing it from entering storm drain systems. In residential areas, this may include amending a landscape strip adjacent to the street or pavement areas where large amounts of runoff can be intercepted from lots. In commercial areas this is likely to be limited to stormwater planter areas. At roadways, soil amendments will be used where roadway flows are diverted into the landscape areas.
- **Stream buffer:** As indicated in the project description, improvements are proposed to the Pleasant Grove Creek channel to provide wetland mitigation, enhance the stream corridor, and provide opportunities for sheet flow to be bio-treated before flows enter the stream.
- **Vegetated swales:** Required at all storm drain outlet locations, vegetated swales offer additional treatment in the treatment train, and opportunities for additional infiltration of runoff.
- **Stormwater retention:** Retention of stormwater allows constituents to be filtered and trapped prior to entering the stream channel.

Treatment control features are generally engineered technologies designed to remove pollutants from site runoff. Additional treatment control features in the CSP could include oil/water grit

separators, sand filter systems, stormwater planters, vegetated swales, end of pipe velocity attenuation, settling areas, in-stream detention areas, and end of pipe grassy swales.

Figure 4.13-5, *Proposed Water Quality Treatment Locations in the CSP,* and Figure 2-14, in the Project Description, illustrate proposed water quality outfall locations. These grassy swales and vegetated channels will be used to remove pollutants by filtration. In-stream detention in Pleasant Grove Creek would include low-flow areas to allow pollutants to settle. Constructed wetlands, which are shallow pools with or without open water elements that create growing conditions suitable for marsh plants, provide treatment by decreasing flow velocities and increased filtration opportunities. These BMPs are typically situated near outfalls and within the open spaces. Landscaped roadside channels and or buffer strips are also effective.

Oil/water grit separators, sand filter systems, stormwater planters, vegetated swales, or other onsite structural controls could be used in commercial or other areas where higher-than-normal levels of pollutants could be generated.

The specific LID strategies and structural BMPs that could be used in the CSP area, either individually or in combination, will be refined at the tentative map and site development stage to account for site specific plans. Drainage features will be designed to comply with the standards established as part of the City's Phase II Stormwater Management Program, and the City's *Stormwater Management Design Manual*. As more detailed information is developed for each land use (tentative map/site development), and target pollutants are identified, the design of specific stormwater treatment devices such as those referenced above, vegetative plantings, bio-filters, or other proprietary devices will be incorporated in to the design.

Compliance with the NPDES regulations and MM 4.13-2, which requires implementation of Stormwater Management measures, would ensure stormwater treatment devices specific to the land uses in the CSP are implemented to the maximum extent practicable. Stormwater treatment devices will be chosen for their effectiveness in reducing urban pollutants in stormwater runoff to meet the Basin Plan and water quality objectives of the City's Phase II SWMP. Taken together, all of these measures will avoid violation of any water quality standards, will avoid the creation of substantial additional sources of polluted runoff, and will avoid any substantial degradation of water quality. As a result, potential water quality effects from urban runoff will be **less than significant**.

URBAN RESERVE

Future development of the Urban Reserve parcel would result in urban runoff. Although Placer County has developed and implemented a Phase 2 program, the land uses in the Urban Reserve have only been identified at a conceptual level for purposes of this programmatic analysis. The types of BMPs that could be used in the Urban Reserve have not been identified and how they would be monitored has not been established. Development would increase water quality impacts. Therefore, the impacts of urban runoff could be **significant**.

Implementation of MM 4.13-3, Storm Water Quality Policies, in conjunction with compliance with the City of Roseville's permit requirements would reduce urban runoff and pollutants so that water quality standards are not violated, substantial additional sources of polluted runoff will not be created, and substantial degradation of water quality will be avoided. As a result, impacts to water quality will be mitigated to a **less than significant** level.

4.13.5 MITIGATION MEASURES

The Project area was included in the program-level analysis of the West Roseville Specific Plan Final EIR. Mitigation adopted by the City Council at time of approval in 2004 is still applicable in the CSP area unless superseded by CSP project-specific mitigation, and will continue to apply to the Urban Reserve area unless noted. This following refers to the previously adopted WRSP mitigation measures as "WMM", and will show either ~~strikeout~~ for language that is being eliminated from the previously adopted WMMs or <u>underline</u> for language that is proposed to be added to the previously adopted WMMs.

The following text denoted by ~~strike through~~ would not be included in the project because a large detention basin to accommodate the WRSP flows is not proposed as part of the CSP. Sufficient stormwater detention facilities are planned in the WRSP area, however. As described above, stormwaters for the CSP would be detained by in-stream improvements.

WMM 4.12-1 ***Prepare Site Specific Drainage Study (Impact 4.13-1 and 4.13-2 - Urban Reserve)***

~~If a larger dentention basin near the main branch of Curry Creek is used for the Remainder Area, and includes flows for the WRSP Area,~~ Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall prepare a site-specific drainage study. The study shall identify appropriate sizing and to ensure that ~~Remainder Area~~ Urban Reserve flows~~, in combination with flows generated in the WRSP Area, can be accommodated in the larger basin. The study shall also be used to identify features that~~ will limit peak flow runoff from the areas drained to Pleasant Grove Creek to pre-development levels per the PCFCWCD SWMM and City standards. ~~The study shall also be used to demonstrate the larger basin will not cause or exacerbate downstream flooding conditions in the SOI Amendment Area or at downstream locations outside the SOI Amendment area.~~ The drainage study shall be submitted to the PCFCWCD and the City of Roseville for review. ~~If a basin in the Remainder Area is used to store flows generated by sheds C-WP7 and C-WP8 in the WRSP Area, in addition to Remainder Area generated flows, the drainage study shall ensure that sufficient capacity is provided to manage total flows into the basin.~~

WMM 4.12-2 ***Pay Fair Share of Roseville Regional Stormwater Retention Facility Improvements (Impact 4.13-3- CSP and Urban Reserve)***

The City shall collect the Pleasant Grove Drainage fee from the applicants prior to the approval of each building permit, which would cover the cost of retention for that development's portion of the Roseville regional retention basin at Reason Farms.

WMM 4.12-3 ***Retention Policies (Impact 4.13-3- Urban Reserve)***

Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall demonstrate, through the preparation of technical engineering studies, that the increased volume of stormwater runoff from the ~~SOI Amendment~~ Urban Reserve Area, which includes the ~~WRSP~~ CSP Area, can be accommodated in the approved regional

stormwater retention facility. The results of the study shall be submitted to the City of Roseville Public Works Department for review and concurrence. The facility shall be expanded as necessary, funded through fair share contributions by project developers.

WMM 4.12-4 ***Floodplain Policies*** **(Impact 4.13-4- Urban Reserve)**

Specific Plans and/or other development proposals for the ~~Remainder Area~~ Urban Reserve shall identify the 100-year floodplain for each location that could be affected by fill placement or installation of structures to ensure water surface elevations estimated in the Master Drainage Study would not be measurably increased. If measurable increases are identified, redesign or relocation of the fill or structures shall be considered. In addition, the recalculated water surface elevations shall be used to determine what improvements, if any, are necessary to provide adequate mitigation so that offsite risk of flooding is not increased as a result of ~~Remainder Area~~ Urban Reserve development, in combination with the WRSP development. Those improvements shall be required to be constructed as a condition of approval of the proposed development.

MM 4.13-1 ***Implementation of Construction Activity Stormwater Protection Standards (Impact 4.13-5- CSP and Urban Reserve)***

Prior to the issuance of a City grading permit and the commencement of construction activities, compliance with the State's General Construction permit, the City of Roseville's Construction Standards and the City's Stromwater BMP Guidance Manual shall be met. This compliance shall include the creation of a Storm Water Pollution Prevention Plan (SWPPP) that will identify the site, the location of sensitive habitats or watercourses, drainage areas, discharge locations, soil disturbance areas, and the locations of all runoff, erosion control, and sediment control Best Management Practices (BMPs). Ongoing monitoring shall be conducted, and adjustments to the SWPPP shall be implemented when needed to address changes in the field as construction activities evolve.

MM 4.13-2 ***Stormwater Management Development Standards (Impact 4.13-6 - CSP and 4.13-5 – Urban Reserve)***

At the tentative map or site development stage, development shall be conditioned to include source control and treatment control measures, including but not limited to LID strategies and BMP treatment as required by the City's then current design standards and the City's then current General Phase II Water Quality Permit issued by the State. The measures shall include, but are not limited to, the measures identified above and in Table IV.B.2 *Applicable LID Measures by Development Type*, found in the *Creekview Drainage and Stormwater Master Plan* found in O of this report.

MM 4.13-3 ***Storm Water Quality Policies (Impact 4.13-5 and Impact 4.13-6- Urban Reserve)***

Specific Plans and/or other development proposals for the Urban Reserve shall identify measures to reduce water quality impacts as a result of construction. Future development shall include low impact development (LID) measures. LID improvements shall be required to be constructed as a condition of approval of the proposed development.