

3.7 HYDROLOGY AND WATER QUALITY

As a result of the *Initial Study*,¹ the City of Pasadena determined that the *Arroyo Seco Master Plan* (proposed project) had the potential to result in significant impacts to hydrology and water quality; therefore, hydrology and water quality were carried forward for detailed analysis in this Master Environmental Impact Report. This analysis was undertaken to identify opportunities to avoid, reduce, or otherwise mitigate potentially significant impacts to hydrology and water quality and identify potential alternatives. This section is based on review of the *City of Pasadena Comprehensive General Plan*;² the *Regional Comprehensive Plan and Guide*;³ and the *Flood Hazard, Sediment Management, and Water Features Analyses, Hahamongna Watershed Park, Pasadena, CA*.⁴ The analysis of hydrology and water quality indicates a description of the regulatory framework that guides the decision-making process, existing conditions of the proposed project area, thresholds for determining if the proposed project would result in significant impacts, anticipated impacts, mitigation measures, and the level of significance after mitigation.

3.7.1 Regulatory Framework

This regulatory framework sets the context for the range of issues related to hydrology and water quality that the City of Pasadena shall consider in the evaluation of the potential for a project to have a significant effect on hydrology

¹ City of Pasadena, 2000. *Initial Study Arroyo Seco Mater Plan Project*. Contact: Department of Planning and Permitting, 175 North Garfield, Pasadena, CA 91109. Prepared by: Sapphos Environmental Inc., 133 Martin Alley, Pasadena, CA 91105.

² City of Pasadena, Planning Division, 1994. *City of Pasadena Comprehensive General Plan*. Contact: Community Planning Section, 175 North Garfield Avenue, Pasadena, CA 91109-7215.

³ Southern California Association of Governments (SCAG), 1995. *Regional Comprehensive Plan and Guide*. Contact: 818 W. Seventh Street, 12th Floor Los Angeles, CA 90017.

⁴ Takata Associates, 17 January 2000. *Flood Hazard, Sediment Management, and Water Features Analyses, Hahamongna Watershed Park, Pasadena, CA*. Prepared by: Philip Williams and Associates, Ltd.

and water quality. The consideration of potential effects on resources within the City of Pasadena is largely undertaken in relation to the *City of Pasadena Comprehensive General Plan* and *Arroyo Seco Design Guidelines*,⁵ a component of the proposed project. In addition, the Arroyo Seco is bordered to the north by lands subject to the jurisdiction of the U.S. Forest Service, to the northeast by the Altadena community of the County of Los Angeles, and to the northwest by the City of La Canada Flintridge.

FEDERAL

National Environmental Policy Act

Elements of the proposed project could potentially be funded by federal grant monies. The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any project "...financed, assisted, conducted or approved by a federal agency..." In making a decision on the issuance of federal grant monies for elements of the proposed project, the federally designated lead agency pursuant to NEPA is required to "...determine whether the proposed action may significantly affect the quality of the human environment."

Section 401 of the Clean Water Act of 1972

The Federal Clean Water Act (CWA)⁶ of 1972 sets national goals and policies to eliminate discharge of water pollutants into navigable waters and to achieve a water-quality level that will protect fish, shellfish, and wildlife while providing for recreation in and on the water whenever possible. The act regulates point-source and non-point -source discharges to receiving waters under the National Pollutant Discharge Elimination System (NPDES) program.

⁵City of Pasadena, Planning Division, 1994. *City of Pasadena Comprehensive General Plan*.
Contact: Community Planning Section, 175 North Garfield Avenue, Pasadena, CA 91109-7215.

⁶ 33 U.S.C § 1341: "Certification."

In 1987, the CWA was amended to provide that the discharge of pollutants to waters of the United States from stormwater is effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. The 1987 amendments to the CWA added Section 402(p), which established a frame work for regulating municipal, industrial, and construction stormwater discharges under the NPDES program. The proposed project would be subject to the CWA and adherence to the NPDES requirements would be expected during construction and operation.

Municipal Urban (Area-wide) Storm-Water Discharges

A municipal separate storm sewer system, as defined by the U.S. Environmental Protection Agency (EPA)⁷ must obtain an NPDES permit by a certain date according to the population served by the system. Municipal separate storm sewer system officials must submit an NPDES permit application and supporting information to the respective RWQCB.⁸

The CWA provides for delegating certain responsibilities for water-quality control and planning to the states. California has been authorized by the EPA to administer and enforce portions of the CWA, including the NPDES program. Section 208 of the CWA is designated to provide a comprehensive planning framework for both point- and non-point-source water pollution. Specific planning requirements include but are not limited to the following:

- ?? Identification of needed treatment works to meet anticipated requirements over a 20-year period;
- ?? Identificat ion of construction priorities for the region; and
- ?? Procedures and methods to control non-point-source pollution emanating from agriculture, mining, and other sources.

⁷ Technology, Trade & Commerce Agency. Last Viewed 12 April 2002. *National Permit Discharge Elimination System (NPDES)*. Available at: <http://commerce.ca.gov/state/ttca/ttca> .

⁸ 33 U.S.C, §1288: "Areawide Waste Treatment Management."

Most owners or operators of facilities that discharge waste into a municipal sanitary sewer system need to obtain an NPDES permit. The EPA, the State Water Resources Control Board (SWRCB), and the respective Regional Water Quality Control Board (RWQCB) or the local wastewater management agency might require some industries to treat industrial hazardous wastes before such wastes are discharged to a municipal sanitary sewer system. The local wastewater management agency advises industries of those requirements.

Industrial

Persons whose discharges are composed entirely of industrial storm-water runoff may be eligible to be regulated under a General Industrial Storm Water Permit issued by the SWRCB rather than an individual NPDES permit issued by the appropriate RWQCB. The General Industrial Storm Water Permit regulates storm-water runoff from eligible industrial facilities, including the following:

- ?? Facilities subject to storm-water effluent guidelines;⁹
- ?? Manufacturing facilities;
- ?? Mining and oil and gas facilities;
- ?? Hazardous-waste treatment, storage, and/or disposal facilities;
- ?? Landfills, land-application sites, and open dumps that receive industrial waste;
- ?? Recycling facilities, such as metal scrapyards, battery reclaimers, salvage yards, and automobile yards;
- ?? Steam electric -generating facilities;
- ?? Transportation facilities;
- ?? Sewage-treatment plants; and,
- ?? Certain facilities if materials are exposed to storm water.

General Construction Activity

⁹ 40 CFR, Subchapter N et. seq.: "Effluent Guidelines and Standards." Washington, D.C. Office of the Federal Register, National Archives and Records Administration.

The SWRCB has also adopted a General Construction Activity Storm Water Permit for storm-water discharges associated with a qualifying construction activity, including clearing, grading, excavation, reconstruction, and dredge and fill activities that result in the disturbance of at least five acres of total land area.

Executive Order 11988

Executive Order 11988, dated May 24, 1977, has as an objective the avoidance of, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain (100-year floodplain) and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative. Under the Executive Order, the U.S. Army Corps of Engineers (Corps) must provide leadership and take action to

- ?? Avoid development in the base floodplain unless it is the only practicable alternative;
- ?? Reduce the hazard and risk associated with floods;

- ?? Minimize the impact of floods to human safety, health, and welfare; and
- ?? Restore and preserve the natural and beneficial values of the base floodplain.

STATE

Order No. 96-054, Regional Water Quality Control Board, Los Angeles Region

The CWA¹⁰ is administered and enforced by the SWRCB, which develops regulations to implement water-quality control programs mandated at the federal and state levels. In California, the NPDES permits are issued through SWRCB and the nine regional water-quality control boards.

¹⁰ 33 U.S.C. § 1251 et. seq.

The RWQCB conducted an assessment of the Los Angeles County in the mid-1990s and identified impairment of a number of the water bodies in Los Angeles County.¹¹ Pollutants found to have caused impairment or may potentially cause impairment to the beneficial use of the water bodies include heavy metals, coliform bacteria, enteric viruses, pesticides, nutrients, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organic solvents, sediments, trash, debris, algae, scum, and odor. These pollutants were found to increase human and aquatic life health risks through contact with the contaminated water.

On July 15, 1996, the RWQCB adopted Order No. 96-054, which is the NPDES Permit (NPDES No. CAS614001) (Permit) for municipal stormwater and urban runoff discharges within the County of Los Angeles. This Permit covers 85 cities and the unincorporated areas of Los Angeles County, with the exception of the portion of Los Angeles County in the City of Avalon and the Antelope Valley including Palmdale, and Lancaster. Under the permit, the County is designated as the Principal Permittee and the 85 cities as Permittees.

To comply with the Permit with the objective of reducing pollutants in stormwater and urban runoff, the Permittees including the County and the City of Pasadena, have developed a variety of stormwater management programs covering Illicit Connection/Illicit Discharge, Development Planning, Development Construction, Public Agency Activities, and Public Information and Participation. Model Programs were created for various categories.

As part of the Development Planning Model Program, the Standard Urban Stormwater Mitigation Plan (SUSMP) was created to guide development and redevelopment planning, engineering, and construction efforts in compliance with the Permit. The primary objectives are to

- ?? Effectively prohibit non-stormwater discharges and
- ?? Reduce the discharge of pollutants from stormwater conveyance systems to the maximum extent practicable.

¹¹ Regional Water Quality Control Board, Los Angeles Region, 1996. *Water Quality Assessment*.

In February 2002, the RWQCB adopted the resolution that established SUSMP criteria for priority projects as defined in the SUSMP Manual.¹² According to this manual, the priority projects subject to SUSMP include any project located within or directly adjacent to or discharging to an environmentally sensitive area. Since the Arroyo Seco is environmentally sensitive, development and implementation of the Specific Plans must comply with the SUSMP and related water quality control requirements.

LOCAL

City of Pasadena General Plan

The *City of Pasadena Comprehensive General Plan*¹³ has identified a series of strategies and policies relating to the City's water resources, including conservation of its water resources along with prudent use through sound resource-management practices. The policies include the following:

Policy 101.0 The Department of Water and Power (DWP) should continue to work with water-management groups seeking to implement regional water-development plans and programs or to protect or enhance present water resources.

Policy 102.0 Water production and its protection should have priority consideration in the development of any supplementary uses of DWP lands.

Policy 103.0 Uncovered open spaces should be managed to maximize opportunities for the percolation of precipitation or delivered water.

¹² County of Los Angeles Department of Public Works. July 2000. *Standard Urban Stormwater Mitigation Plan*. July 2000.

¹³ City of Pasadena, 1994.

Land Use and Mobility Element of the *City of Pasadena Comprehensive General Plan*

Policy 9.5 Stewardship of the Natural Environment: Encourage and promote the stewardship of Pasadena's natural environment, including water conservation, clean air, and natural open-space protection and recycling. Encourage the use of native, water-conserving and regionally appropriate landscaping.

Policy 18.2 Water Conservation: Increase the efficiency of water use among Pasadena residents, and commercial and industrial organizations.

3.7.2 Existing Conditions

The Arroyo Seco Watershed (Watershed) can be divided into three segments: the upper basin from JPL area to the headwaters, the Hahamongna Watershed Park (Park) and Devil's Gate Dam (Dam), and the Central and Lower Arroyo Seco Master Plan Areas; each segment contains distinct topographic, geologic, hydrologic, and drainage features.

Channel and Floodplain Characteristics

Storm runoff from the 21.75-square-mile upper basin in the Angeles National Forest drains into the Park (Figure 3.7.2-1, Arroyo Seco Tributary). There are approximately 20 main tributaries upstream of JPL: Bear, Little Bear, Brown Mountain, Cloudburst, Mt. Lawlor, Ladybug, Daisy, Colby, Long, Dark, Twin, Brown, Pine, Falls, Nino, Agua, Fern, Raccoon, El Prieto, and Millard. Additionally, Flint Wash joins Arroyo Seco immediately upstream of the dam. The highest elevation of the mountain is Strawberry Peak at 6,164 feet NGVD. The channel invert at the headwater near Red Box is at 4,300 feet. The channel slope varies from 0.09 ft/ft at the headwater to 0.016 ft/ft in the Park and further reduces to 0.01 ft/ft in the central and lower reach.

Upstream of the Park, the Arroyo Seco remains natural and is typically narrow, steep, and V-shaped with confined floodplains. The high-velocity flows on the mountain slopes and in the steep channels have caused significant erosion and contributed to sedimentation in the Park. However, in many reaches, the channel bed has attained its stability with exposure of the bedrock or formation of significant armor layers. Continuing erosion and sedimentation today are most likely due to slope failure and hillside erosion.

In addition to the upper drainage basin, a 10-square-mile tributary area contributes flows to Arroyo Seco from the upstream boundary of the Park near the JPL Bridge to the dam. Direct drainage to the Park is mostly through storm drains from local municipalities except for Flint Wash, which is an unimproved open channel draining to the southwest corner of the Hahamongna Park.

The Arroyo Seco suddenly reduces its longitudinal gradient downstream of the Angeles National Forest boundary, which creates a natural sediment deposition area in the Park. High sedimentation potential is also related to construction of the Devil's Gate Dam and Reservoir for downstream flood protection. During the past flood events, the sediment laden flows entered the reservoir and left large volumes of sediments behind the Dam. Currently, sediment management and removal are the responsibility of the Los Angeles County Department of Public Works (LACDPW). Removal of sediments consisted of sluicing (pushing sediment through the gate) and excavation based on an as needed, economic-efficiency basis. From dam construction in 1919 to 1995, there have been approximately 3,660 acre-feet excavated and 1,370 acre-feet sluiced. However, the sediment volume deposited in the area exceeded that removed, which caused reduction of the active reservoir storage volume and the flood control function of the dam. Low-flow channels were formed within the reservoir, meandering through the Park and connecting to the sediment excavation area and the low flow outlet at the dam.

Downstream of Devil's Gate Dam, the Arroyo Seco features a narrow floodplain valley and is mostly confined by bridges and concrete lining. The flow is conveyed through a short natural canyon and then emerges at the Brookside Golf Course. The Arroyo Seco is a trapezoidal concrete channel extending from

the golf course to north of Seco Street. South of Seco Street, it remains a concrete channel, extending 750 feet south to the natural drainage channel under the Holly Street Bridge, the Colorado Street Bridge, and into the lower reach. The water meanders within the valley before it flows over a spillway and back into the concrete channel. The channel remains mostly concrete lined from the Arroyo Seco confluence to the Los Angeles River outlet at the Pacific Ocean.

There are nine major tributaries to Arroyo Seco downstream of the Dam: Montana Street Drain, Linda Vista Tributary, Seco Street Drain, Linda Vista Avenue Drain, Annandale Country Club Drainage, Laguna Road Storm Drain, Figueroa Street Storm Drains (downstream of Avenue 64 and Avenue 52), and Avenue 50 Storm Drain. The total drainage area from these tributaries is 5,228 acres or 8.17 square miles.

Devil's Gate Dam and Reservoir Operation

Devil's Gate Dam is operated in a relatively simple way and has been operated this way since at least 1977. Under all flow and sediment transport situations, the lowest elevation outlet gate is kept open until water levels behind the dam rise to elevation 1,010 feet NGVD. In this way, flow-assisted sediment transport through the dam is maximized without compromising flood protection, thereby reducing the amount of sediment accumulation and the subsequent required excavation in the reservoir. Through this operating strategy, storage capacity is maximized for use during major storm events.

During relatively large storm events, when water levels exceed elevation 1,010 feet NGVD, the lowest outlet gate is closed and other gates, such as the 7-foot by 10-foot slide gates in the tunnel, are used to make releases. Closing the lowest gate once water levels reach 1,010 feet NGVD causes debris and sediment to settle out of suspension farther away from the dam, reducing clogging at the lowest outlet structure. Generally, once water levels behind the dam reach 1,040.5 feet NGVD (the elevation of the spillway crest), all gates are closed and releases are made only through the spillway ports. The second spillway, an ogee spillway, has a crest elevation of 1,067 feet NGVD and is the final outlet structure for the most extreme events. The spillways were completely reconstructed with the dam retrofit in 1995.

Stormwater

The upper watershed in the Angeles National Forest remains natural without urban pollution. Along the way, water is added to the system from runoff, storm drains, and natural springs. Storm drains from urban areas contribute trash, and storm runoff from hills contributes sediments. There are existing equestrian, biking, and hiking trails as well as parks along the channel, which may involve trash and animal wastes. The Central Arroyo Seco contains asphalt parking areas that surround the Rose Bowl. There are no landscaped areas to break up the expanse of asphalt. The stormwater runoff from all impervious surfaces flows directly into the flood control channel without treatment. Currently, water quality is good within the Arroyo Seco; however, control of

trash will be a future focus for water quality improvement since this watershed is part of the Los Angeles River, which is listed in 303(d) by EPA for trash TMDL.

Groundwater

The Hahamongna Watershed Park is situated over part of an unconfined groundwater aquifer known as the Monk Hill Basin. Together, the Pasadena Subarea, the Santa Anita Subarea, and the Monk Hill Basin make up a larger unconfined aquifer called the Raymond Basin (Figure 3.7.2-2, Raymond Basin Aquifer). The Raymond Basin aquifer is approximately 40 square miles in area and underlies much of the City of Pasadena. It is bounded to the north by the San Gabriel Mountains, to the south and east by the San Gabriel Valley, and to the west by the San Rafael Hills. The Monk Hill and greater Raymond Basin aquifers are composed largely of unconsolidated alluvial sediments (conveyed by runoff processes), ranging to a maximum thickness of approximately 1,100 feet. Below the Hahamongna Watershed Park, the alluvial aquifer is composed of relatively coarse sediments from Arroyo Seco. These coarse sediments make the aquifer very permeable. Water percolates from the surface to the groundwater relatively quickly, and groundwater flows at relatively high rates. The many groundwater wells along the Arroyo Seco are used for both water supply and monitoring groundwater contamination from JPL.

The City currently has the right to divert up to 25 cfs to the Arroyo Seco Spreading Grounds and gain proportional groundwater pumping credit from the Raymond Basin Management Board (RBMB). However, the City currently only has spreading capacity to handle an 18 cfs diversion. Since groundwater is the City's most economical source of municipal water supply, the Department of Water and Power has established the master planning objective of at least maintaining, and potentially expanding the groundwater recharge credit from percolation in the Hahamongna Park.

3.7.3 Significance Thresholds

The City of Pasadena normally considers a project to have a significant impact on hydrology or water quality if the proposed project will have any of the following effects:

- ?? A violation of State Drinking water standards established by the State of California Department of Health Services.
- ?? A net extraction of known groundwater resources or involve excavation within an active groundwater recharge area.
- ?? Alter action of an existing drainage pattern.
- ?? Increase storm water runoff by more than one percent above the baseline condition.
- ?? Capacity of existing storm water facilities is exceeded.
- ?? Result in degradation of water quality such that it is unable to attain mandatory health-related standards of water quality for City water services established by the State of California Department of Health Services.
- ?? Location housing within a 100-year flood hazard area, mapped by the Federal Emergency Management Agency.
- ?? Exposure of people to flood-related hazards.
- ?? Exposure of people or property to inundation from seiche or mudflow.

3.7.4 Impact Analysis

3.7.4.1 Hahamongna Watershed Park Master Plan

The Hahamongna Watershed Park includes Oak Grove Park, Devil's Gate Dam, Johnson Field, equestrian staging areas, multi-use trails, groundwater wells,

water conservation spreading basins, a water treatment plant, asphalt-paved parking areas, various maintenance buildings, and public restrooms.

Floodplain Encroachment Impact Analysis

The plan involves future construction within the floodplain and adjacent to the floodplain based on the 100-year floodplain boundaries delineated in the previous studies for Arroyo Seco and Devil's Gate Dam. The floodplain features and flood water elevations, however, will not be impacted significantly due to the proposed development. The types of construction proposed within the floodplain typically do not require significant fill or dredging that may lead to changes in topographic or geomorphologic characteristics of the Arroyo Seco and Devil's Gate reservoir. No major structure is proposed that may affect the flow resistance or flow conveyance of the channel. The floodplain is very wide and flow velocities are generally slow in the reservoir area; minor encroachment on the floodplain in this area would not cause significant changes in the flood water stages or erosion/sedimentation trends. Therefore, no significant short or long term impacts would be expected as long as the designers and contractors follow the design guidelines that limit significant grading and drainage changes.

Water Quality Impact Analysis

Since the proposed plan involves development within the floodplain or adjacent to floodplain boundaries, significant short term construction impacts to water quality are expected and would require mitigation during the construction period. A description of mitigation measures to alleviate significant impacts is provided below.

Long term, accumulated water quality impacts may be related to potential increase in vehicles, horses, and park and trail users. Trash, oil/grease, fertilizer, and animal waste are the common pollutant sources related to the proposed plan. These impacts would be reduced to below a level of significance with mitigation.

Groundwater Impact Analysis

The plan intends to improve the spreading grounds and to provide groundwater recharge through diversion of surface water in Arroyo Seco. This would result in no adverse or positive impacts to the Raymond Basin.

The plan does not involve activities that could cause soil or groundwater contamination; therefore, it is expected that there would be no significant impacts to groundwater quality.

3.7.4.2 Central Arroyo Seco Master Plan

The Central Arroyo Seco contains the Rose Bowl, the Rose Bowl Aquatic Center, Jackie Robinson Baseball Field, tennis courts, Brookside Golf Course and Clubhouse, multi-use trails, equestrian loop, multi-purpose fields, Rosemont Pavilion, an amphitheater, Brookside Park, and associated asphalt-paved parking.

Floodplain Encroachment Impact

No significant impacts would be expected due to the proposed plan. The construction elements would be mostly outside of the 100-year floodplain or the plan element would not cause any change in floodplain features such as flood elevations, floodplain boundaries, velocities, and erosion/sedimentation patterns.

Water Quality Impacts

Since the proposed plan involves developments adjacent to floodplain boundaries, significant short term construction impacts to water quality would be inevitable and would require mitigation during the construction period. A description of mitigation measures to alleviate significant impacts is provided below.

Long term, accumulated water quality impacts may be related to potential increase in vehicles, horses, and park and trail users. Trash, oil/grease, fertilizer, and animal waste are the common pollutant sources related to the proposed plan. These impacts would be reduced to below a level of significance with mitigation.

Groundwater Impacts

No significant impacts are expected due to the proposed plan. The plan does not include elements that would cause changes in groundwater transport.

3.7.4.3 Lower Arroyo Seco Master Plan

The Lower Arroyo Seco contains a natural park, fly-casting pond and clubhouse, archery range and clubhouse, and multi-use trails for walking, jogging, cycling, and equestrian use.

Floodplain Encroachment Impact

No significant impacts are expected due to the proposed plan. The Arroyo Seco in this reach has the capacity of 100-year flood, except for a few cross-sections. The proposed plan elements are primarily outside of the floodplain, and therefore would not impact the floodplain features and functions.

Water Quality Impacts

Since the proposed plan involves developments adjacent to floodplain boundaries, significant short term construction impacts to water quality are inevitable and would require mitigation during the construction period. A description of mitigation measures that would alleviate significant impacts is provided below.

Long term, accumulated water quality impacts may be related to potential increase in vehicles, horses, and park and trail users. Trash, oil/grease, fertilizer, and animal waste are the common pollutant sources related to the

proposed plan. These impacts would be reduced to below a level of significance with mitigation.

Groundwater Impacts

No significant impacts would be expected due to the proposed plan. The plan does not include elements that could cause changes in groundwater transport.

3.7.4.4 Rose Bowl Use Plan

The Rose Bowl Operating Company has recommended that the City Council approve a Rose Bowl Use Plan that would allow 25 major events, or displacement events, to be permitted annually. The definition of a major event is an event that has a minimum of 20,000 attendees.

Floodplain Encroachment Impacts

No significant impacts would be expected as a result of the proposed project. The plan would not involve construction or activities that could cause changes in the floodplain features or functions.

Water Quality Impacts

The plan would increase visitors and vehicles, therefore, the primary concerns would be trash and oil/grease.

Groundwater Impacts

No significant impacts would be expected as a result of the proposed project. The plan would not include elements which may cause changes in groundwater transport.

3.7.4.5 *Design Guidelines*

The design guidelines will include recommendations for parking lot and trash collection improvements to provide pollution control.

3.7.5 Mitigation Measures

Measure Hydro - 1

A construction storm water pollution prevention plan (SWPPP) shall be prepared prior to construction as part of the final project plan. This plan shall be implemented during and after construction. SUSMP requirements shall be followed and included in project Best Management Practices (BMPs), both for structural and non-structural measures. Parking lots to be constructed within the floodplain may use pervious surfaces to increase infiltration and provide a runoff filtration system. Wetland ponds at the flow outlets or vegetative swales bordering the parking areas may be integrated as part of parking lot design to achieve the water quality improvement objectives. On-site retention systems

may be constructed at the low flow concentration locations or any on-site retention of trash, oil/grease, and other waste shall be removed prior to major storm events to avoid inundation and conveyance to the downstream channel. Frequent site maintenance shall be conducted to ensure that project BMPs are functioning as intended.

Measure Hydro – 2

BMPs for oil/grease control at the existing parking areas and trash management shall be implemented throughout the walking areas to mitigate water quality impacts.

3.7.6 Level of Significant Impact after Mitigation

It is expected that the potential impacts resulting from implementation of the proposed project would be reduced to less than a significant level with implementation of proposed mitigation measures Hydro 1 and Hydro 2.