

4.3 HYDROLOGY AND WATER QUALITY

This section identifies the impacts to hydrology and water quality, which could result from the development of each alternative described in **Section 2.0**. Impacts are measured against the environmental baseline presented in **Section 3.3**. Indirect and cumulative impacts are identified in **Section 4.14** and **Section 4.15**, respectively. Hydrology and water quality mitigation measures are presented in **Section 5.2.2**.

SIGNIFICANCE CRITERIA

A hydrological or flooding impact of a project alternative would be considered significant if it directly or indirectly would:

- Change the quantity, quality, or rate and direction of flow of groundwater or surface water, either by direct additions or withdrawals or by puncture of an aquitard, sufficient to preclude an intended use;
- Substantially alter the existing drainage pattern of the site or area or substantially increases the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
- Place structures within a 100-year flood hazard area as mapped on a federal flood hazard boundary map, flood insurance rate map, or other flood hazard delineation map;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- Introduce development that would interfere with the ability of an agency to repair or maintain levees for public safety; and/or
- Create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

A water quality impact of a project alternative would be considered significant if it directly or indirectly:

- Violates any water quality standards, waste discharge requirements, or otherwise substantially degrades water quality;
- Substantially alters the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation on- or off-site; and/or
- Substantially degrades the existing surface and groundwater quality due to erosion and siltation.

ANALYSIS METHODOLOGY

This section identifies any impacts to hydrology and water quality that could occur from construction and/or operation of the project alternatives. Impacts to hydrology and water quality were analyzed based

on an examination of the project site, published information regarding the water resources of the project area, and field studies. Where it was concluded that impacts to hydrology and water quality resulting from a project alternative would exceed the significance thresholds listed above, mitigation measures have been recommended to reduce impacts to less-than-significant levels.

4.3.1 ALTERNATIVE A – MIXED-USE TRIBAL DESTINATION RESORT AND CASINO

IMPACTS OF ALTERNATIVE A

4.3.1 Construction of Alternative A could result in the pollution of stormwater runoff, adversely impacting surface water and shallow groundwater quality. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measures 2-1** and **2-2** presented in **Section 5.2.2**, a *less-than-significant* impact would occur.

Impact Discussion

Project construction would involve earth moving, grading, and excavation activities, which would result in the alteration of the existing topography of the project site. These activities could result in changes in on-site drainage patterns, and, as with any construction-site, could result in increased erosion or siltation. Water quality decreases with increased turbidity and total suspended solids (TSS) that result from erosion and siltation, influencing downstream ecology. Construction equipment and materials have the potential to leak fluids, thereby discharging additional pollutants into stormwater. Construction-site pollutants may include sediments, oils and greases, concrete, paints, and adhesives. Discharge of these pollutants could result in contamination of area drainages, which could result in downstream surface water and shallow groundwater contamination. Erosion and discharge of pollutants during construction of Alternative A could result in *significant impacts* to water quality.

As discussed in **Section 3.3**, there is no defined groundwater aquifer beneath the project site. The confining bay mud prevents groundwater from traversing through soil layers. Excavation activities could result in exposing super-saturated soils that would require dewatering.

Prior to construction of Alternative A, required erosion and pollutant control measures would be employed in compliance with the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities (General Construction Permit). Provisions of the General Construction Permit require a site-specific plan to be developed that would address each construction component of Alternative A, including the shoreline park and Western/Winehaven Drive roadway improvements. This Storm Water

Pollution Prevention Plan (SWPPP) would be developed prior to any ground disturbance at the project site and would include practices to reduce erosion and surface water contamination during construction. The SWPPP would identify best management practices (BMPs) to address erosion and discharge of construction pollutants as well as the location of such control measures. Components of the General Construction Permit require provisions for dewatering from excavation sites to be included in the SWPPP. The Tribe would apply for coverage under the US Environmental Protection Agency's (USEPA's) NPDES General Construction Permit on the land proposed for trust and under California's NPDES General Construction Permit for construction of the park and roadway improvements (fee lands). Additionally, development on fee lands (shoreline park and roadway improvements) would have to comply with the City of Richmond's (City's) Municipal Code, Chapter 12.44 Excavation, Grading and Earthwork Construction that requires a grading permit including a preliminary and final Erosion and Sediment Control Plan (ESCP) be prepared by a registered civil engineer prior to development. Compliance with NPDES permit requirements and/or City grading permit requirements would result in a *less-than-significant* impact. In addition, the incorporation of BMPs applicable to Alternative A into the SWPPP and the development of an ESCP have been recommended as mitigation in **Section 5.2.2** to reduce potential impacts of Alternative A resulting from construction.

4.3.2 Development of Alternative A would not deplete groundwater or interfere with recharge such that there would be a net deficit in aquifer volume. No impact would occur.

As discussed in **Section 3.3**, the confining bay mud soil layer restricts vertical movement of water through soil layers. There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater has not historically been used on the site as a potable water source and accordingly there are no groundwater supply wells on the project site. *No impact* would occur.

4.3.3 Operation of Alternative A would alter the existing drainage pattern of the site in a manner that could increase surface water runoff. This would be considered a less-than-significant impact.

A watershed's runoff characteristics are altered when impervious surfaces replace natural soil and vegetation. Runoff changes may increase drainage volumes, increase drainage velocities, increase peak discharges, and shorten the time to peak flows, potentially resulting in localized flooding. A preliminary drainage analysis, including a drainage plan, has been developed for each drainage watershed on the project site and is included as **Appendix H** of this EIS/EIR. A summary of the proposed drainage plan is provided below. The water quality analysis and water quality impacts from stormwater generated by Alternative A are discussed below under Water Quality. With the incorporation of project features to reduce impervious surfaces and

incorporation of bioretention facilities into the drainage plan, the project site would be capable of storing the increase in surface water runoff generated as a result of Alternative A.

Implementation of Alternative A would result in *less-than-significant* flooding impacts associated with stormwater runoff.

Drainage Plan

The proposed drainage plan divides the property into the eight distinct watersheds, identified in **Figure 3.3-3**. The plan utilizes collection storm drains, landscaped areas, swales, and bioretention basins to reduce peak runoff flows from the implementation of Alternative A to pre-existing conditions. Refer to **Appendix H** for the complete drainage plan.

Existing Watershed 1

Minor roadway improvements are planned along Western Drive to maintain the existing vertical profile. Small storm drain improvements are planned to convey the existing runoff flow paths from the eastern upland area across Western Drive to a proposed 11,900 square feet (sf) bioretention basin, and then discharge to a swale leading to the Bay.

Existing Watershed 2

This watershed includes the existing Winehaven building located on the western side of Western Drive that would be retained. Existing former Navy housing east of Western Drive would also be retained. The proposed project would include improvements to Western Drive (maintaining the vertical profile) and the construction of a new parking area located north of the existing Winehaven Building. The proposed storm drain system would collect runoff from the upland areas east of the historic housing, the area around the Winehaven Building, and a portion of Watershed 3 that would include the main casino structure. Runoff would then be directed to a 15,600 sf below ground stormwater treatment vault with discharge leading to a swale, which leads into the Bay. The slight redirection of runoff from the main casino building is an option to better follow the proposed street layout. The casino area could be drained to the existing watershed as presented in the Stormwater Management Plan (SWMP) presented in **Appendix H**.

Existing Watershed 3

Development within this watershed would present the greatest change to existing conditions. This watershed would contain the main parking structure, casino, and conference buildings. The project improvements would also include new access roads, service roads, and paved areas. The main parking structure would be located within a natural valley; however, the size of the structure would require significant grading of the natural side slopes. The project grading would be a combination of cut grading with new retention walls, and cut grading shaped to provide a stable slope. The proposed storm drains would begin at the east side of the new parking structure with an open swale collecting and directing runoff around the south side of the structure. Along the

south side of the structure, runoff would be conveyed down a steep slope by a concrete lined ditch, which leads to a drainage inlet at the bottom of the slope. At this point, storm drains would convey the runoff across Western Drive, between the casino and conference buildings; to a 37,500 sf below ground stormwater treatment vault that discharges to a swale that leads into the Bay.

Existing Watershed 4

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 4 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 6100 sf bioretention basin, and discharge to a swale that leads into the Bay.

Existing Watershed 5

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 5 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 3000 sf bioretention basin, and discharge to a swale that leads into the Bay.

Existing Watershed 6

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 6 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 2100 sf bioretention basin, and discharge to a swale that leads into the Bay.

Existing Watershed 7

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 6 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 1400 sf bioretention basin, and discharge to a swale that leads into the Bay.

Existing Watershed 8

This watershed includes the planned improvements to the hotel and to the coastal and trail and hillside access roads. Runoff would result from the roof of the hotel parking structure, the hotel, the cottages and cottage access roads, and the coastal access road. All of the proposed storm drains would convey runoff to a point below the hotel bluff, discharge to a 13,700 sf bioretention basin, and then discharge to a swale that leads into the Bay.

4.3.4 Implementation of Alternative A would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact would occur.

Trust Land

Development of the project components on trust land would shift jurisdiction from local authorities to the Federal Government. Floodplain management is addressed in Executive Order 11988, which requires the evaluation of Federal actions taken in a floodplain. Specifically, the Order states that agencies shall first determine whether the proposed action would occur in a floodplain. Secondly, if an agency proposes to allow an action to be located in a floodplain, “the agency shall consider alternatives to avoid adverse impacts and incompatible development in the floodplains” (42 F.R. 26951). Finally, if the only practicable alternative action requires siting in a floodplain, the agency shall “minimize potential harm to or within the floodplain.” The entirety of the project footprint would not be located in a floodplain as mapped by the Federal Emergency Management Agency (FEMA), as shown in **Figure 3.3-2**. The project does not include damming of waters and there are no downstream structures of populated centers as the site discharges directly to the Bay. Therefore, *no impact* would occur on trust land.

Fee Lands

The development of the shoreline park and roadway improvements under Alternative A on fee land would remain under the jurisdiction of the City and would be governed by the policies outlined within the City’s General Plan (**Table 3.3-6**). The General Plan provisions require new development to implement flood control measures on all creeks and watersheds to reduce impacts from 100-year storm events. The provisions also require special design features if a new development is located within a 100-year floodplain or area prone to flooding from sea level rise. The project site does not contain surface water features beyond ephemeral drainages and the project has implemented drainage improvement features to control runoff within the watershed; therefore, Alternative A would not be impacted by a 100-year storm event. The project footprint is not located within a 100-year floodplain or area prone to flooding from a rise in sea level. Development on fee lands would be consistent with the City’s policies regarding flood hazards. *No impact* would occur.

4.3.5 Operation of Alternative A would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the

shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.3.6 Operation of Alternative A would introduce an additional source of pollutants to surface water and groundwater. This would be a less-than-significant impact.

Runoff from the developed project site could transport contaminants to the San Francisco Bay (Bay) and the groundwater beneath the site. Parking areas and roadways are a primary area of concern due to the number of pollutants (i.e. oil, metals) that originate from vehicles. Fertilizers and pesticides applied to landscaping may also enter surface runoff and reduce surface water quality. To control operational storm water pollution and protect water quality, Alternative A includes a combination of site planning, structural treatment BMPs, and non-structural source control BMPs.

Site planning includes the minimization of impermeable surfaces and development of a design-grade Stormwater Control Plan in accordance with Richmond Municipal Code 12.22.050. In addition, the project has been designed to incorporate two main structural BMPs: the stormwater bioretention basin described previously and sediment/grease traps, which would be installed prior to any discharge points. This would ensure that the runoff from paved surfaces is treated prior to release to the Bay. These features would reduce by approximately 80 percent the TSS and other potentially environmentally polluting mineral or materials such as oils and greases, nutrients and metals.

The sediment/grease separators would be designed to comply with the Federal stormwater treatment guideline of 80 percent reduction of TSS in post-construction stormwater runoff as described in the USEPA guidance document *National Management Measures Guidance to Control Nonpoint Source Pollution from Urban Areas* (EPA 842-B-02-003). This guidance document indicates that 80 percent reduction of TSS is assumed to control heavy metals, phosphorous, and other pollutants. Storm event monitoring data provides specific removal efficiencies for various pollutants (Step, 2003). The bioretention basin would provide additional removal efficiency. A summary of the pollutant reduction efficiencies is listed in **Table 4.3-1**.

TABLE 4.3-1
ESTIMATED STORMWATER QUALITY – ALTERNATIVE A

Pollutant	Anticipated Level in Stormwater (mg/L) ^A	Stormceptor Reduction Efficiency ^B	Detention Basin Reduction Efficiency ^C	Estimated Minimum Reduction Efficiency	Anticipated Discharge Pollutant Level (mg/L)
Total Suspended Solids	80	80%	30-65%	80%	16
Total Petroleum Hydrocarbon	3.5	80%	N/A	80%	0.70
Total Phosphorus	0.3	11%	15-45%	15%	<0.3
Total Nitrogen	2	43%	15-45%	43%	<2
Zinc	0.14	39%	15-45%	39%	<0.1
Copper	0.01	28%	15-45%	28%	<0.01
Lead	0.018	51%	15-45%	51%	<0.01

Sources: ^A USEPA, 2002.

^B STEP, 2003.

^C USEPA 1999.

Numerical water quality objectives have been set for some of the expected pollutants. For pollutants that do not have numerical limits set, water quality objectives are narrative and require protection of beneficial uses. For these pollutants, drinking water maximum contaminant levels (MCLs) have been considered, which would be protective of beneficial uses of both surface water and groundwater. A comparison of the expected stormwater quality and water quality objectives for the area shows that anticipated water stormwater quality would meet all applicable water quality objectives. This comparison is provided in **Table 4.3-2**.

Based on the comparison, project site runoff quality is expected to meet applicable water quality objectives for all of the pollutants of concern for the protection of beneficial uses. Reduction goals for nutrient levels would be ensured through source control measures. Specifically, fertilizer use would be controlled to apply only what is required and would be adjusted for nutrient levels observed in the recycled water irrigation source. Fertilizer would not be applied prior to a rain event and irrigation amounts would be reduced or eliminated during the wet season to prevent excessive runoff.

The combination of structural and non-structural BMPs would reduce pollutants in stormwater to the maximum extent practicable. These BMPs would be specifically outlined in the Tribe's Stormwater Control Plan required with the development application. **Section 5.0** commits the Tribe to developing the design-grade Stormwater Control Plan in accordance with the Richmond Municipal Code 12.22.050. Therefore, Alternative A would result in *less-than-significant* impacts to surface water quality.

TABLE 4.3-2
COMPARISON OF STORMWATER DISCHARGE AND DESIGN OBJECTIVES – ALTERNATIVE A

Pollutant	Anticipated Discharge Pollutant Level (mg/L)^A	Design Objective	Basis for Objective
Total Suspended Solids	16	312	Objective based on USEPA recommended 80% reduction efficiency.
Total Petroleum Hydrocarbon	0.70	No visible film.	San Francisco Bay Basin Plan for oil and grease.
Total Phosphorus	<0.3	N/A	N/A
Total Nitrogen (NO ₃)	<2	45	Objective based on California Primary Drinking Water Standard, which is expected to protect beneficial uses.
Zinc	<0.1	5.0	Objective based on California Secondary Drinking Water Standard, which is expected to protect beneficial uses.
Copper	<0.01	1.0	Objective based on California Secondary Drinking Water Standard, which is expected to protect beneficial uses.
Lead	<0.01	0.015	Lead Action Level. California Health and Safety Code

Source: ^A STEP, 2003.

4.3.2 ALTERNATIVE B – MIXED-USE TRIBAL DESTINATION RESORT AND CASINO WITH RESIDENTIAL COMPONENT

IMPACTS OF ALTERNATIVE B

4.3.7 Construction of Alternative B could result in the pollution of stormwater runoff, adversely impacting surface water and shallow groundwater quality. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 2-1** and **2-2** presented in **Section 5.2.2**, a *less-than-significant* impact would occur.

Impact Discussion

Erosion-related impacts during construction of Alternative B would be greater when compared to Alternative A, due to the increase in impervious surfaces from the residential development on fee land. Implementation of Alternative B would result in an additional 35-acres of land disturbance

when compared to Alternative A and would require more construction vehicles and materials that would increase the potential for stormwater contamination. The increase in land disturbance could result in *significant impacts* to a greater extent than Alternative A.

During construction of Alternative B, required erosion and construction pollutant control measures would be employed in compliance with the NPDES General Construction Permit. The SWPPP would be required to address the additional potential for contamination as a result of the increase in land disturbance compared to Alternative A. The BMPs discussed under Alternative A would be applicable to Alternative B and an ESCP would be required to include the additional land disturbance for the residential area. Compliance with NPDES permit requirements and/or City grading permit requirements would result in a *less-than-significant* impact. In addition, **Mitigation Measures 2-1** and **2-2** apply the BMPs and ECP discussed under Alternative A to Alternative B.

4.3.8 Development of Alternative B would not deplete groundwater or interfere with recharge such that there would be a net deficit in aquifer volume. No impact would occur.

As discussed in **Section 3.3**, the confining bay mud soil layer restricts vertical movement of water through soil layers. There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater has not historically been used on the site as a potable water source and accordingly there are no groundwater supply wells on the project site. *No impact* would occur.

4.3.9 Operation of Alternative B would alter the existing drainage pattern of the site in a manner that could increase surface water runoff. This would be considered a less-than-significant impact.

The potential for stormwater impacts associated with on-site flooding during operation of Alternative B would be greater than Alternative A. Under Alternative B, stormwater runoff rates would increase due to the additional development of residential land uses. Although portions of the residential neighborhood would contain pervious coverage such as landscaping, the increase in development would result in a corresponding increase in stormwater runoff rates when compared to Alternative A. However, it should be noted that the southern area of the project site planned for residential development is mostly paved; therefore, the increase in impervious surfaces would be minimal. The drainage study (**Appendix H**) includes an analysis of the increase in impervious surfaces on the project site from the development of Alternative B and necessary detention capacity to prevent on-site flooding of drainage facilities. A summary of the drainage plan for Alternative B is described below. The incorporation of the bioretention basins in the site plan assures that Alternative B would detain the added runoff due to the development

of the project site. Therefore, potential impacts to on-site drainage systems associated with flooding are considered *less-than-significant*.

Drainage Plan

The drainage plan for Alternative B is similar to Alternative A with the addition of drainage features to handle surface water runoff from the residential area to be located at the south end of the project site, within Existing Watersheds 4 through 7.

Existing Watershed 1

Watershed 1 would consist of the same grading improvements and outcomes as discussed under Alternative A.

Existing Watershed 2

Watershed 2 would consist of the same grading improvements and outcomes as discussed under Alternative A.

Existing Watershed 3

Watershed 3 would consist of the same grading improvements and outcomes as discussed under Alternative A.

Existing Watersheds 4 through 7 would include the proposed residential area located at the south end of the project site. The proposed residential area would be primarily sited on an abandoned railway, which sides with the eastern edges of the residential and street footprint against the base of the coastal hills. The natural watersheds from the hills would remain unchanged. At the most the runoff from the uplands will be collected into new storm drains and conveyed along the streets, collect storm runoff from the residential areas and streets and discharge to the treatment areas located west of Western Drive. The storm drain plan identifies two treatment areas, one for Watersheds 4 and 5, and one for Watersheds 6 and 7. These two treatment basins could also be configured for four locations, as presented in the SWMP prepared by LFR, Inc (**Appendix H**).

Existing Watershed 4

Most of this watershed remains in a natural state except for a small portion within the proposed residential footprint. Improvements within the watershed include widening and realigning Western Drive, new residential streets, and high-density residential structures. Storm drain improvements would be designed to collect runoff from the natural upslope areas, new residential areas on the east side of Western drive, convey the runoff to a 8800 sf bioretention basin, and finally discharge to a swale that leads to the Bay. The 8800 sf bioretention basin could also be combined with the Watershed 5 basin with a total size of 30,900 sf.

Existing Watershed 5

Just over half of this watershed remains in a natural state. Improvements within the watershed would include the widening and realignment of Western Drive, new residential streets, and high-density residential structures. Storm drain improvements would be made to collect runoff from the natural upslope areas and the new residential areas on the east side of Western Drive. Runoff would be conveyed to a 22,100 sf bioretention basin and discharged to a swale that leads to the Bay. This 22,100 sf bioretention basin could also be combined with the Watershed 4 basin with a total size of 30,900 sf.

Existing Watershed 6

Approximately half of Watershed 6 would remain in a natural state. Improvements within the watershed would include the widening and realignment of Western Drive, new residential streets, and high-density residential structures. Storm drain improvements would be made to collect runoff from the natural upslope areas and the new residential areas on the east side of Western Drive. Runoff would be conveyed to a 14,400 sf bioretention basin and discharged to a swale that leads to the Bay. This 14,400 sf bioretention basin could also be combined with the Watershed 7 basin with a total size of 23,900 sf.

Existing Watershed 7

Most of this watershed remains in a natural state except for a small portion within the proposed residential footprint. Improvements within the watershed would include the widening and realignment of Western Drive, new residential streets, and high-density residential structures. Storm drain improvements would be made to collect runoff from the natural upslope areas and the new residential areas on the east side of Western Drive. Runoff would be conveyed to a 9500 sf bioretention basin and discharged to a swale that leads to the Bay. This 9500 sf bioretention basin could also be combined with the Watershed 5 basin with a total size of 23,900 sf.

Existing Watershed 8

This watershed would include the planned hotel and improvements and to both the coastal and trail access roads. Runoff would derive from the roof of the hotel parking structure, the hotel, the cottages and cottage access road, and the coastal access road. All of the proposed storm drains would convey runoff to a point below the hotel bluff, discharge to a 13,700 sf bioretention basin, and then discharge to a swale that leads to the Bay.

4.3.10 Implementation of Alternative B would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact would occur.

Trust Land

The entirety of the project area is not located in a floodplain as mapped by FEMA (**Figure 3.3-2**). The project does not include damming of waters and there are no downstream structures of populated centers as the site discharges directly to the bay. Therefore, *no impact* would occur on trust lands.

Fee Lands

The development of the shoreline park, roadway improvements, and residential neighborhood under Alternative B would be located on lands held in fee by the Tribe under the jurisdiction of the City and would be governed by the policies outlined within the City's General Plan (**Table 3.3-6**), as discussed under Alternative A. The project site does not contain surface water features besides ephemeral drainages and the project has implemented drainage features to control runoff within the watershed; and therefore, would not be impacted by a 100-year storm event. The project footprint is not located within a 100-year floodplain or area prone to flooding from a raise in sea level. Development on fee lands would be consistent with City policies regarding flood hazards. *No impact* would occur.

4.3.11 Operation of Alternative B would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.3.12 Operation of Alternative B would alter the existing drainage pattern of the site in a manner that would introduce an additional source of pollutants to surface water and groundwater. This would be a less-than-significant impact.

To control operational storm water pollution and protect surface water quality, Alternative B would utilize a combination of site planning, structural treatment BMPs, and non-structural source control BMPs, similar to those described for Alternative A.

Site planning would include the minimization of impermeable surfaces and the incorporation of stormwater bioretention basins and sediment/grease traps to ensure that the runoff is minimized from the paved surfaces and is filtered prior to release to the surface runoff drainage system (see **Section 4.3.1** for more details). A summary of the pollutant reduction efficiencies for the

proposed drainage scheme is listed in **Table 4.3-1**. A comparison of the expected effluent levels to water quality objectives are provided in **Table 4.3-2**.

Based on the comparison, project site runoff quality is expected to comply with and potentially exceed applicable water quality objectives for all of the pollutants of concern for the protection of beneficial uses. Reduction goals for nutrient levels would be ensured through source control measures. The combination of structural and non-structural BMPs would reduce pollutants in stormwater to the maximum extent practicable. These BMPs would be specifically outlined in the Tribe's Stormwater Control Plan required with the development application. **Section 5.0** commits the Tribe to developing the design-grade Stormwater Control Plan in accordance with the Richmond Municipal Code 12.22.050. Therefore, Alternative B would result in *less-than-significant* impacts to surface water quality.

4.3.3 ALTERNATIVE C – REDUCED INTENSITY MIXED-USE TRIBAL DESTINATION RESORT AND CASINO

IMPACTS OF ALTERNATIVE C

4.3.13 Construction of Alternative C could result in the pollution of stormwater runoff, adversely impact surface water and shallow groundwater quality. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 2-1** and **2-2** presented in **Section 5.2.2**, a *less-than-significant* impact would occur.

Impact Discussion

Erosion-related impacts during construction of Alternative C would be reduced when compared to those of Alternative A, due to the decrease in overall land disturbance compared to Alternative A. Implementation of Alternative C would result in 10 fewer acres of land disturbance when compared to Alternative A and would require fewer construction vehicles and construction materials, decreasing the potential for contamination of stormwater runoff compared to Alternative A. The decreased in land disturbance could still result in *significant impacts*, albeit to a lesser extent, than Alternative A.

During construction of Alternative C, required erosion and construction pollutant control measures would be employed in compliance with the NPDES General Construction Permit, with fewer measures required within the SWPPP based on the reduction in intensity of land development. Although fewer would be required, the BMPs discussed under Alternative A would be applicable to Alternative C and an ESCP would be required. Compliance with NPDES

permit requirements and/or City grading permit requirements would result in a *less-than-significant* impact. In addition, mitigation recommended in **Section 5.2.2** would incorporate the BMPs and an ESCP, discussed under Alternative A, into the project description of Alternative C.

4.3.14 Development of Alternative C would not deplete groundwater or interfere with recharge such that there would be a net deficit in aquifer volume. No impact would occur.

As discussed in **Section 3.3**, the confining bay mud soil layer restricts vertical movement of water through soil layers. There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater has not historically been used on the site as a potable water source and accordingly there are no groundwater supply wells on the project site. *No impact* would occur.

4.3.15 Operation of Alternative C would alter the existing drainage pattern of the site in a manner that could increase surface water runoff. This would be considered a less-than-significant impact.

Stormwater generation impacts during operation of Alternative C would be reduced when compared to those for Alternative A. Under Alternative C, the increase in stormwater runoff rates over pre-existing conditions would be less than Alternative A. Although more portions of the site would remain as open space compared to Alternative A, Alternative C would still result in an increase in stormwater runoff over existing conditions, and require detention to account for this increase. The drainage study (**Appendix H**) includes an analysis of the increase in impervious surfaces on the project site from the development of Alternative C and necessary detention capacity to prevent on-site flooding of drainage facilities. A summary of the drainage plan for Alternative C is described below. The incorporation of the bioretention basins in the site plan assures that Alternative C would detain the added runoff due to the development of the project site. Therefore, potential impacts to on-site drainage systems associated with flooding are considered *less-than-significant*.

Drainage Plan

The drainage plan for Alternative C is similar to Alternative A, except drainage improvements would be reduced without the development of the hotel, hotel parking, hotel access road, and the cottages.

Existing Watershed 1

Project improvements within Watershed 1 would be similar to those discussed under Alternative A.

Existing Watershed 2

Project improvements within Watershed 2 would be similar to those discussed under Alternative A. Runoff would be directed to a 17,400 sf below ground stormwater treatment vault with discharge from the vault leading to a swale that leads to the Bay. The slight redirection of runoff from the main casino building is an option to better follow the proposed street layout. The casino area could be drained to the existing watershed as presented in the SWMP presented in **Appendix H**.

Existing Watershed 3

Project improvements within Watershed 3 would be similar to those discussed under Alternative A; however, under Alternative C the below ground stormwater treatment vault would be 30,800 sf.

Existing Watershed 4

Except for the proposed improvements to Western Drive, this watershed would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 4200 sf bioretention basin, and discharge to a swale that leads to the Bay.

Existing Watershed 5

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 5 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 3000 sf bioretention basin, and discharge to a swale that leads to the Bay.

Existing Watershed 6

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 6 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 2100 sf bioretention basin, and discharge to a swale that leads to the Bay.

Existing Watershed 7

Except for the proposed improvements to Western Drive and minor bike trail parkland improvements along the waterfront, Watershed 7 would remain relatively unchanged. Storm drain improvements would be made to collect runoff from the east side of Western Drive, convey the runoff to a 1400 sf bioretention basin, and discharge to a swale that leads to the Bay.

Existing Watershed 8

Except for small improvements proposed near the foot of the dock and access are improvements, Watershed 8 would remain relatively unchanged. Storm drain improvements would be made to collect runoff along the foot of the tall coastal bluff, convey the runoff to an 1800 sf bioretention basin, and discharge to a swale that leads to the Bay.

4.3.16 Implementation of Alternative C would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact would occur.

Trust Land

The entirety of the project area is not located in a floodplain as mapped by FEMA (**Figure 3.3-2**). The project does not include damming of waters and there are no downstream structures of populated centers as the site discharges directly to the bay. Therefore, *no impacts* from flooding would occur on trust lands.

Fee Lands

The development of the shoreline park and roadway improvements under Alternative C would be located on lands held in fee by the Tribe under the jurisdiction of the City and would be governed by the policies outlined within the City's General Plan (**Table 3.3-6**), as discussed under Alternative A. The project site does not contain surface water features besides ephemeral drainages and the Tribe would develop drainage features to control runoff within the watershed; and therefore, would not be impacted by a 100-year storm event. The project footprint is not located within a 100-year floodplain or area prone to flooding from a raise in sea level. Development on fee lands would be consistent with City policies regarding flood hazards. *No impact* would occur.

4.3.17 Operation of Alternative C would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.3.18 Operation of Alternative C would alter the existing on-site drainage pattern in a manner that would introduce an additional source of pollutants to surface water and groundwater. This would be a less-than-significant impact.

To control operational storm water pollution and protect surface water quality, Alternative C would utilize a combination of site planning, structural treatment BMPs, and non-structural source control BMPs, similar to those described for Alternative A.

Site planning would include the minimization of impermeable surfaces and the incorporation of stormwater bioretention basins and sediment/grease traps to assure that the runoff is minimized from the paved surfaces and is filtered prior to release to the surface runoff drainage system (see **Section 4.3.1** for more details). A summary of the pollutant reduction efficiencies for the proposed drainage scheme is listed in **Table 4.3-1**. A comparison of the expected effluent levels to water quality objectives are provided in **Table 4.3-2**.

Based on the comparison, project site runoff quality is expected to meet applicable water quality objectives for all of the pollutants of concern for the protection of beneficial uses. Reduction goals for nutrient levels would be ensured through source control measures. The combination of structural and non-structural BMPs would reduce pollutants in stormwater to the maximum extent practicable. These BMPs would be specifically outlined in the Tribe's Stormwater Control Plan required with the development application. **Section 5.0** commits the Tribe to developing the design-grade Stormwater Control Plan in accordance with the Richmond Municipal Code 12.22.050. Therefore, Alternative C would result in *less-than-significant* impacts to surface water quality.

4.3.4 ALTERNATIVE D – NON-TRUST ACQUISITION WITH NON-GAMING MIXED- USE DEVELOPMENT

IMPACTS OF ALTERNATIVE D

4.3.19 Construction of Alternative D could result in the pollution of stormwater runoff, adversely impact surface water and shallow groundwater quality. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 2-1** and **2-2** presented in **Section 5.2.2**, a *less-than-significant* impact would occur.

Impact Discussion

The potential for erosion-related impacts during construction of Alternative D would be greater than Alternative A, due to the increase in overall land disturbance when compared to Alternative A. Implementation of Alternative D would result in an additional 32 acres of land disturbance, when compared to Alternative A, and would require more construction vehicles and construction

materials, thus increasing the potential for contamination of stormwater runoff compared to Alternative A. Land disturbance could result in *significant impacts*, to a greater extent than Alternative A.

Because the site would not be taken into trust, the Tribe would apply for coverage under California's NPDES General Construction Permit under Alternative D. Additionally, the Tribe would have to comply with the City's Building Department Excavation Grading and Earthwork ordinance that requires a preliminary and final ESCP be prepared by a registered civil engineer prior to development. Compliance with NPDES permit requirements and/or City grading permit requirements would result in a *less-than-significant* impact. In addition, BMPs applicable to Alternative D and an ESCP prepared by a registered civil engineer have been recommended as mitigation presented in **Section 5.2.2** to reduce impacts on both trust and fee lands.

4.3.20 Development of Alternative D would not deplete groundwater or interfere with recharge such that there would be a net deficit in aquifer volume. No impact would occur.

As discussed in **Section 3.3**, the confining bay mud soil layer restricts vertical movement of water through soil layers. There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater has not historically been used on the site as a potable water source and accordingly there are no groundwater supply wells on the project site. *No impact* would occur.

4.3.21 Operation of Alternative D would alter the existing drainage pattern of the site in a manner that could increase surface water runoff, potentially resulting in flooding. This would be considered a less-than-significant impact.

Under Alternative D, the increase in stormwater runoff rates over pre-existing conditions would be greater than Alternative A. The drainage study (**Appendix H**) includes an analysis of the increase in impervious surfaces on the project site from the development of Alternative D and necessary detention capacity to prevent on-site flooding of drainage facilities. A summary of the drainage plan for Alternative D is described below. The incorporation of the bioretention basins in the site plan assures that Alternative D would detain the added runoff due to the development of the project site. Therefore, potential impacts to on-site drainage systems associated with flooding are considered *less-than-significant*.

Drainage Plan

Alternative D would include the same proposed residential improvements at the southern end of the project site as Alternative B. In addition, there would be single-family residences located

along the top of a bluff, and a significant area for proposed commercial development with some additional high-density residential development.

Existing Watershed 1

Project improvements within Watershed 1 would be similar to those discussed under Alternative B; however, under Alternative D the proposed bioretention basin would be 11,400 sf.

Existing Watershed 2

Project improvements within Watershed 2 would be similar to those discussed under Alternative B; however, under Alternative D the below ground stormwater treatment vault would be 174,700 sf.

Existing Watershed 3

Project improvements within Watershed 3 would be similar to those discussed under Alternative B. This watershed would encompass the main area of commercial development with a network of streets that are both parallel and perpendicular to Western Drive. The project improvements would also include off-street parking areas, landscaped areas, and service roads. A portion of the main commercial area is placed up against the natural slopes; however the size of the commercial footprint requires significant grading of the natural side slopes. The project grading is a combination cut grading retained by new retaining walls, and cut grading shaped to provide a stable slope. The proposed storm drains start at the east side of the new commercial area with connections to the new storm drains located in the streets, conveyed west in the streets to a 31,500sf below ground stormwater treatment vault. The discharge from the vault connects to a swale leading to the Bay.

As with Alternative B, Alternative D would involve existing Watersheds 4 through 7 that would include the proposed residential area located at the south end of the project site. The proposed residential area would be primarily sited on an abandoned railway, which sides with the eastern edges of the residential and street footprint against the base of the coastal hills. The natural watersheds from the hills would remain unchanged. At the most, the runoff from the uplands will be collected into new storm drains and conveyed along the streets, collect storm runoff from the residential areas and streets and discharge to the treatment areas located west of Western Drive. The storm drain plan identifies two treatment areas, one for Watersheds 4 and 5, and one for Watersheds 6 and 7. These two treatment basins could also be configured for four locations, as presented in the SWMP prepared by LFR, Inc (**Appendix H**).

Existing Watershed 4

Project improvements within Watershed 4 would be similar to those discussed under Alternative B.

Existing Watershed 5

Project improvements within Watershed 5 would be similar to those discussed under Alternative B.

Existing Watershed 6

Project improvements within Watershed 6 would be similar to those discussed under Alternative B.

Existing Watershed 7

Project improvements within Watershed 7 would be similar to those discussed under Alternative B.

Existing Watershed 8

This watershed would include the planned single-family residential lots and access street located on the top of an existing bluff, combined commercial and residential along the western toe of the bluff, and improvements to the access road and trail at the toe of the bluff. Residential runoff may be directed to either of the treatment areas for Watersheds 8 or 3. The storm drain plan identified the residential lots and cul-de-sac as draining to the Watershed 3 treatment basin; however the location presented in the SWMP is also viable. Runoff from the natural areas of the bluff, the costal access road, the residential areas at the top of the bluff, and the commercial structures along the foot of the bluff would be positively drained with storm drains and open ditches to the 17,900 sf bioretention basin at the western toe of the bluff, and then discharge to a swale that leads to the Bay.

4.13.22 Development of Alternative D would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact would occur.

The entirety of the project area is not located in a floodplain as mapped by FEMA (**Figure 3.3-2**). The development of all components under Alternative D would be located on lands held in fee by the Tribe under the jurisdiction of the City and would be governed by the policies outlined within the City's General Plan (**Table 3.3-6**). The project site does not contain surface water features and the Tribe would implement upgraded drainage features to control runoff within the watershed and therefore would not be impacted by a 100-year storm event. The project footprint is not

located within a 100-year floodplain or area prone to flooding from a rise in sea level. Development on fee lands would be consistent with City policies regarding flood hazards. *No impact* would occur.

4.3.23 Operation of Alternative D would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.2.24 Operation of Alternative D would alter the existing on-site drainage pattern in a manner that would introduce an additional source of pollutants to surface water and groundwater. This would be a less-than-significant impact.

To control operational storm water pollution and protect surface water quality, Alternative D would utilize a combination of site planning, structural treatment BMPs, and non-structural source control BMPs, similar to those described for Alternative A.

Site planning would include the minimization of impermeable surfaces and the incorporation of stormwater bioretention basins and sediment/grease traps to assure that the runoff is minimized from the paved surfaces and is filtered prior to release to the surface runoff drainage system (see **Section 4.3.1** for more details). A summary of the pollutant reduction efficiencies for the proposed drainage scheme is listed in **Table 4.3-1**. A comparison of the expected effluent levels to water quality objectives are provided in **Table 4.3-2**.

Based on the comparison, project site runoff quality is expected to meet applicable water quality objectives for all of the pollutants of concern for the protection of beneficial uses. Reduction goals for nutrient levels would be ensured through source control measures. The combination of structural and non-structural BMPs would reduce pollutants in stormwater to the maximum extent practicable. These BMPs would be specifically outlined in the Tribe's Stormwater Control Plan required with the development application. **Section 5.0** commits the Tribe to developing the Stormwater Control Plan in accordance with the Richmond Municipal Code 12.22.050. Therefore, Alternative D would result in *less-than-significant* impacts to surface water quality.

4.3.5 ALTERNATIVE E – TOTAL PARKLAND

IMPACTS OF ALTERNATIVE E

4.3.25 Development of Alternative E would not introduce new avenues of stormwater pollution. No impact to the existing setting would occur.

Implementation of Alternative E would not involve earth moving or excavation activities; however, it may involve minimal grading activities associated with the Bay Trail. Existing topography of the project site would be minimally altered under this alternative. Implementation of Alternative E would not introduce new impervious surfaces that would increase stormwater runoff rates. If upon final design, grading activities were to impact lands greater than one acre, implementation of a SWPPP, as described above under Alternative A, would occur prior to any construction to reduce any impacts to less-than-significant levels. Implementation of Alternative E would involve minimal construction or operational activities, and therefore is not likely to introduce avenues to entrain construction or operational contaminants into surface water or groundwater resources. The existing drainage pattern would be maintained and water resources would experience existing siltation rate. *No impact* would occur to the existing setting would occur.

4.3.26 Operation of Alternative E would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.3.27 Development of Alternative E would not alter the existing drainage pattern and therefore would not result in flooding. No impact to the existing setting would occur.

The watershed's runoff characteristics would be maintained under Alternative E. No new impervious surfaces would be introduced into the project site. Therefore, the current flooding potentials would be maintained. *No impact* to existing settings would occur.

4.3.28 Development of Alternative E would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact to existing settings would occur.

The project site is not located in a floodplain as mapped by FEMA (**Figure 3.3-2**). The development of new project components such as public restrooms would be completed on land retained by the City. Under this alternative, the project site would not be taken into federal trust. The project site is not located within a 100-year floodplain or an area prone to flooding from a rise in sea level. Development on City lands would be consistent with policies regarding flood hazards. *No impact* would occur.

4.3.6 ALTERNATIVE F – NO ACTION

IMPACTS OF ALTERNATIVE F

4.3.29 Implementation of Alternative F would not introduce new avenues of stormwater pollution. No impact to the existing setting would occur.

Implementation of Alternative F would not involve earth moving, grading, and excavation activities and would not result in the alteration of the existing topography of the project site. Additionally, implementation of Alternative F would not introduce new impervious surfaces that could increase stormwater runoff rates. Implementation of Alternative F would not involve construction or operational activities, and therefore would not introduce avenues to entrain construction or operational contaminants into surface water or groundwater resources. The existing drainage pattern would be maintained and water resources would experience existing siltation rate. *No impact* to the existing setting would occur.

4.3.30 Implementation of Alternative F would not deplete groundwater or interfere with recharge such that there would be a net deficit in aquifer volume. No impact would occur.

As discussed in **Section 3.3**, the confining bay mud soil layer restricts vertical movement of water through soil layers. There are no aquifers underlying the project site capable of providing potable water in quantities available to meet the need of previous on-site development (US Navy, 2002a). Groundwater has not historically been used on the site as a potable water source and accordingly there are no groundwater supply wells on the project site. *No impact* would occur.

4.3.31 Implementation of Alternative F would not alter the existing drainage pattern and therefore would not result in flooding. No impact to the existing setting would occur.

The watershed's runoff characteristics would be maintained under Alternative F. No new impervious surfaces would be introduced into the project site. Therefore, the current flooding potentials would be maintained. *No impact* to the existing setting would occur.

4.3.32 Implementation of Alternative F would not result in inundation by seiches or tsunamis. No impact would occur.

As discussed in **Section 3.3**, the location of project site is not located in an area with the potential for inundation by a seiche or tsunami. The project site is located in the inner, northern bay and would be protected from a tsunami generated deep in the ocean to the west. Additionally, the shape of the bay does not provide the confining banks necessary to result in seiche. *No impact* would occur.

4.3.33 Implementation of Alternative F would not place structures within a floodplain and would not expose people or structures to a significant risk of loss, injury or death involving flooding. No impact to existing settings would occur.

The entirety of the project area is not located in a floodplain as mapped by FEMA (**Figure 3.3-2**), and under Alternative F, the Tribe would not construct new structures. The existing drainage patterns would continue to flow under existing conditions to the bay. *No impact* to the existing setting would occur.