3.8 Hydrology and Water Quality

This section addresses the hydrologic and water quality characteristics of the project site and vicinity and addresses potential impacts to hydrology and water quality associated with implementation of the Preferred Alternative of the 2012 Nut Tree Airport Master Plan update (Proposed Project). The environmental setting describes the precipitation and runoff of the area, surface water and groundwater conditions, and water quality issues. The regulatory setting section describes the pertinent federal, state, and local laws related to the hydrology and water quality of a surface mining operation. The impacts and mitigation measures section defines impact significance criteria, discusses potential impacts, and where necessary, provides applicable mitigation measures.

3.8.1 Environmental Setting

Surface Water

The Proposed Project is located within the Putah-Cache hydrologic unit, part of the Sacramento River Basin (Conservation, 2012). The most significant drainage features within the vicinity of the project site are Horse Creek and Pine Tree Creek, both of which run through the Proposed Project area. The creeks originate in the English Hills to the west of the Proposed Project and flow south and east to Ulatis Creek. Water from Ulatis Creek then flows to Cache Slough, and into the Sacramento River west of Liberty Island at the northern end of the Delta, and ultimately to San Francisco Bay. Pine Tree Creek is culverted at several locations, including at an airstrip access road at the south end of the Project site, at the main airport access road at the southeast end of the Project site and at Monte Vista Avenue adjacent to the Project Site. Horse Creek is culverted at the airport runway in the northwest area of the Project site, and at Monte Vista Avenue in the southwest area of the Project site (LSA, 2007).

Drainage

The City of Vacaville maintains a network of storm drains within the city. The City maintains most of the channel reaches of the storm drains, keeping the channel flowlines free from debris and vegetation. The Solano County Water Agency (SCWA) maintains Ulatis Creek, west of Nut Tree Road to the city limit line, and Alamo Creek from Nut Tree Road to the city limit. SCWA is also responsible for maintenance of the modified creeks downstream of the City (Vacaville, 2010).

The storm drain system is made up of a series of pipes under City streets that convey stormwater runoff to the various creeks. The storm drain pipes range in diameter from 12 to 96 inches. The capacities of these pipelines were designed for a storm event with a 10-year return frequency, which is a standard design practice. Stormwater in excess of a 10-year event would pond in the streets or be conveyed through the streets until it reaches a channel or creek (Vacaville, 2010).

The Putah South Canal, which intersects the south/southwest area if airport property, originates from the Putah Diversion Dam located at Lake Solano, located approximately nine miles

northwest of Nut Tree Airport. One of the Putah South Canal detention basins for stormwater is located on the west/southwest are of airport property. Several other storm drainage areas are located on airport property, four of which are located along the west, northwest, and northeast sides of airport property, and an additional stormwater drainage area is located southeast of the Runway 02 threshold (Solano County, 2012).

Flooding

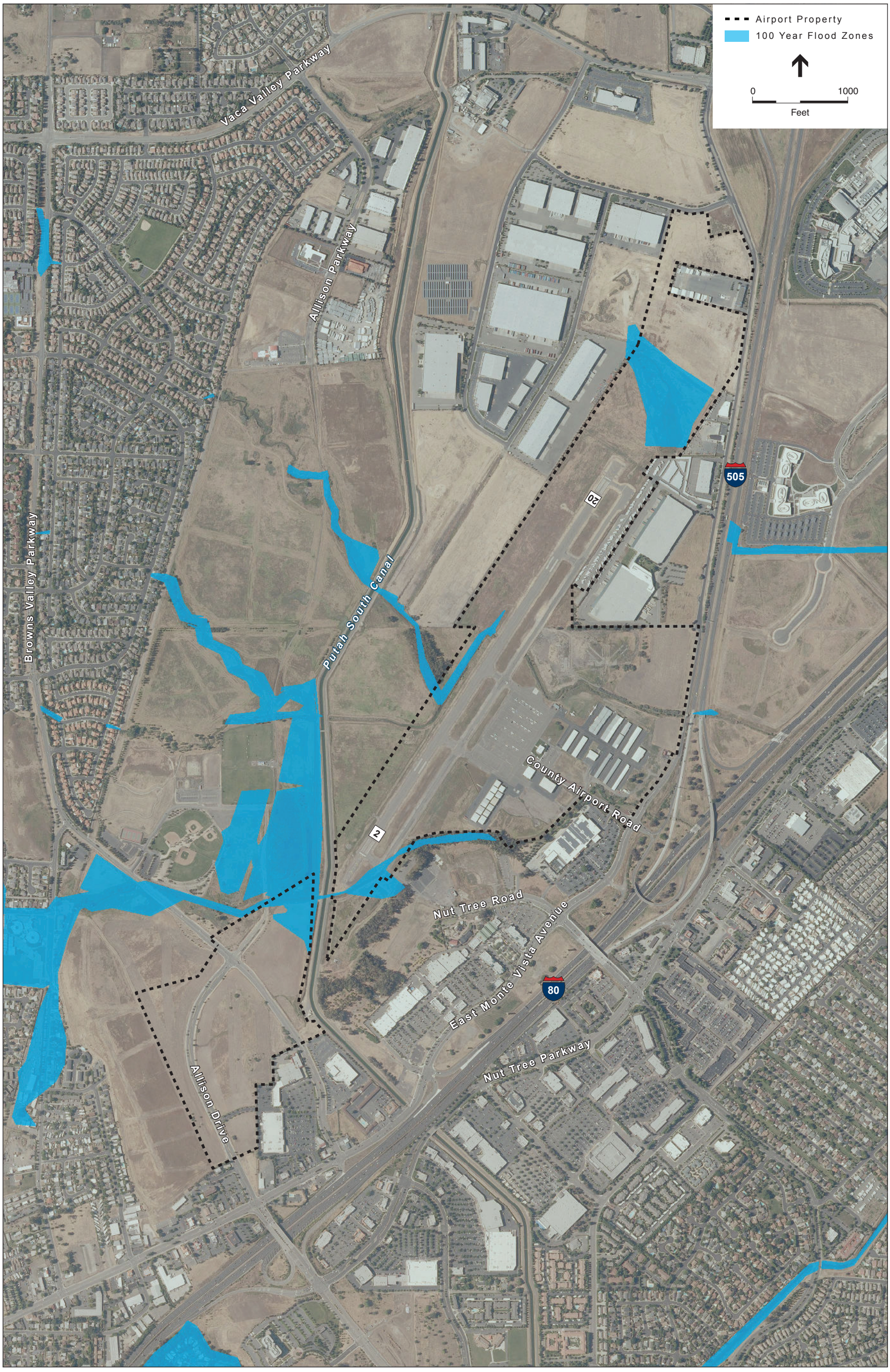
Figure 3.8-1 shows boundaries for 100-year flood zones that extend into the Nut Tree Airport property. Based on Federal Emergency Management Agency (FEMA) 100-year flood mapping methodology, no creeks, channels or drainage areas are subject to 100-year floods on the project site. However, in several areas the 100-year flood zone is located adjacent to proposed project facilities. A drainage basin to the northeast of the existing runway is within a 100-year flood zone, as well as portions of Horse Creek and Pine Tree Creek adjacent to the runway (**Figure 3.8-1)**.

Groundwater

The primary water-bearing formations comprising the Solano subbasin are sedimentary continental deposits of Late Tertiary (Pliocene) to Quaternary (Recent) age. Fresh water-bearing units include younger alluvium, older alluvium, and the Tehama Formation (DWR, 2004). The units pinch out near the Coast Range on the west and thicken to a section of nearly 3000 feet near the eastern margin of the basin. Saline water-bearing sedimentary units underlie the Tehama formation and are generally considered the saline water boundary (DWR, 2004).

Flood basin deposits occur along the eastern margin of the subbasin. These deposits consist primarily of silts and clays, and may be locally interbedded with stream channel deposits of the Sacramento River. In the delta, flood basin deposits contain a significant percentage of organic material (peat), and are sometimes mapped as peaty mud (DWR, 2004). Thickness of the unit ranges from 0 to 150 feet. The flood basin deposits have low permeability and generally yield low quantities of water to wells. Recent stream channel deposits consist of unconsolidated silt, fine- to medium grained sand, gravel and in some cases cobbles deposited in and adjacent to active streams in the subbasin. They occur along the Sacramento, Mokelumne and San Joaquin Rivers, and the upper reaches of Putah Creek. Thickness of the younger alluvium ranges from 0 to 40 feet, however with the exception of the Delta, they generally lie above the saturated zone. Older alluvium consists of loose to moderately compacted silt, silty clay, sand, and gravel deposited in alluvial fans during the Pliocene and Pleistocene. Thickness of the unit ranges from 60 to 130 feet, about one quarter of which is coarse sand and gravel generally found as lenses within finer sands, silts, and clays. Permeability of the older alluvium is highly variable. (DWR, 2004).

The Tehama Formation is the thickest water-bearing unit underlying the Solano subbasin, ranging in thickness from 1500 to 2500 feet. Surface exposures of the Tehama Formation are limited mainly to the English Hills along the western margin of the basin. It consists of moderately compacted silt, clay, and silty fine sand enclosing lenses of sand and gravel, silt and gravel, and cemented conglomerate. Permeability of the Tehama Formation is variable, but generally less than the overlying younger units. Because of its relatively greater thickness, however, wells completed in the Tehama can yield up to several thousand gpm (DWR, 2004).



SOURCE: USDA, 2010; ESRI, 2012; and ESA, 2012

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Figure 3.8-1
FEMA 100 Year Flood Zones

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Underlying the Tehama Formation are brackish to saline water-bearing sedimentary units including the somewhat brackish sedimentary rocks of volcanic origin (Pliocene to Oligocene) underlain by undifferentiated marine sedimentary rocks (Oligocene to Paleocene). These units are typically of low permeability and contain connate water. The upper contact of these units generally coincides with the fresh/saline water boundary at depths as shallow as a few hundred feet near the Coast Range on the west to nearly 3000 feet near the eastern margin of the basin (DWR, 2004).

Water Quality

Water quality refers to the chemical, biological, and physical characteristics of water. The water quality within a watershed is influenced by surrounding land uses. Constituents found in urban runoff vary; variances can be the result of differences in rainfall intensity, geographic features, and the land use of the area, as well as vehicle traffic and the percentage of impervious surface.

Runoff from the Vaca Mountains and English Hills, which are the headwaters for the creeks draining through Vacaville, is laden with sediment, which increases the turbidity (cloudiness) of the water flowing in the creeks. The sediment load in the runoff results from the erosive soils within the Ulatis Creek Watershed (Vacaville, 2010).

The term “receiving water” is typically used to describe any water body, such as a creek, river, reservoir, or canal, which receives runoff. In the context of the Proposed Project, it refers to those water bodies that would receive runoff from the Proposed Project site in excess of the 100-year event. The primary receiving water is Ulatis Creek, which drains to Cache Slough.

The natural weather pattern in the Proposed Project area consists of a long dry period from May to October, and a wet season from November to April. During the seasonal dry period, pollutants contributed by vehicle exhaust, vehicle tire and brake wear, spills, and atmospheric fallout accumulate within the watershed. Household herbicides, pesticides, fertilizers, and other chemicals also accumulate within the watershed. Precipitation during the early portion of the wet season displaces these pollutants into the stormwater runoff, which can result in elevated pollutant concentrations in the initial wet weather runoff.

Concentrations of heavy metals present in dry weather runoff are typically higher than concentrations measured in wet weather runoff because of the lower volume of water and infrequence of rain events (Vacaville, 2010). Sources of dry weather runoff constituent pollutants include commercial and domestic irrigation, general wash-off, groundwater infiltration, and other illicit discharges.

Beneficial uses are defined as the uses of water necessary for the survival or well being of man, plants and wildlife. These uses of water serve to promote the tangible and intangible economic, social and environmental goals of mankind. **Table 3.8-1,** below**,** depicts the beneficial uses associated with the affected watershed as described in the Basin Plan (CVRWQCB, 2007).

TABLE 3.8-1
BENEFICIAL USES OF PROJECT-EFFECTED WATERSHED

Beneficial Uses	Ulatis Creek
Municipal and Domestic Supply	X
Agricultural Supply	X
Industrial Service Supply	X
Industrial Process Supply	X
Contact Water Recreation	X
Non-contact Water Recreation	X
Warm Freshwater Habitat	X
Cold Freshwater Habitat	X
Wildlife Habitat	X
Spawning, Reproduction, and/or Early Development	X

SOURCE: CVRWQCB, 2007

In accordance with the requirements of the CWA (see Section 4-6.3 "Regulatory Setting"), the SWRCB has determined that beneficial uses in Ulatis Creek within the Delta are impaired by high concentrations of diazinon and chlorpyrifos (pesticides related to agricultural and urban runoff).

3.8.2 Regulatory Setting

Federal

Clean Water Act

The objective of the federal CWA is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribes the basic federal laws for regulating discharges of pollutants into waters of the U.S.; these laws include setting water quality standards for contaminants in surface waters, establishing wastewater and effluent discharge limits from various industry categories, and imposing requirements for controlling nonpoint-source pollution. At the federal level, the CWA is administered by USEPA. At the state and regional levels, the act is administered and enforced by the State Water Resources Control Board (SWRCB) and the RWQCBs.

Section 404

The purpose of Section 404 of the CWA is to maintain the integrity of U.S. waters through the control of discharge of fill material. Section 404 states that no dredge or fill material may be discharged into aquatic ecosystems unless no adverse effects will result, and that there should be no discharge of dredge or fill material into wetlands if an alternative exists that would have fewer environmental impacts. Adverse effects include those that would jeopardize endangered or threatened species or critical habitat under the ESA of 1973. Section 404 guidelines also recognize that the loss of wetlands is the most significant environmental impact, and that the loss is irreversible. Areas that meet the

definition of "waters of the United States" and lie within the ~~March JPA Planning Area~~ **Proposed Project Area** include Horse Creek, as well as any other blue line areas indicated on USGS topographic maps.

Section 303(d)

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a list of water bodies that do not meet established water quality standards, even after the minimum required levels of pollution control technology have been installed at point sources. The law requires that these jurisdictions establish priority rankings for water bodies on the lists and develop action plans for allowable discharge into the watershed, called total maximum daily loads (TMDL), to improve water quality.

Permits

Since 1972, the CWA has regulated the discharge of pollutants to waters of the United States from all point sources. Section 402(d) of the CWA establishes a framework for regulating nonpoint source (NPS) storm water discharges under the National Pollutant Discharge Elimination System (NPDES) permit program. Established in 1990, Phase I of the NPDES storm water program regulates storm water discharges from major industrial facilities, large and medium-sized municipal separate storm sewer systems (those serving more than 100,000 persons), and construction sites that disturb five or more acres of land. In the 1999 Phase II NPDES storm water program, discharges of storm water associated with construction activities that result in the disturbance of one acre of land or more must also apply for coverage under the statewide NPDES General Construction Permit.

State

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. The act sets out specific water quality provisions and discharge requirements regulating the discharge of waste within any region that could affect the quality of state waters. Under the act, the SWRCB has ultimate authority over state water rights and water quality policy. The nine RWQCBs are responsible for the oversight of water quality on a day-to-day basis at the local/regional level, including the preparation and periodic updating of Basin Plans that identify existing and potential beneficial uses for specific water bodies.

Water Quality Control Plans

Each RWQCB is required to develop, adopt, and implement a Basin Plan, also known as a Water Quality Control Plan, for its respective region. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in each region. Basin Plans identify beneficial uses of surface waters and groundwater within the corresponding region; specify water quality standards, known as water quality objectives, for both surface water and groundwater; and, develop the actions necessary to maintain the standards to control non-point and point sources of pollutants to the state's waters. All discretionary projects requiring permits from the RWQCB (i.e., waste and pollutant discharge permits) must implement

Basin Plan requirements (i.e., water quality standards), taking into consideration the beneficial uses to be protected.

NPDES General Construction Permit

On September 2, 2009, the SWRCB adopted a new General Construction Permit for Discharges of Storm Water Associated with Construction Activities, to become effective on July 1, 2010, replacing the existing permit, which is in effect until June 30, 2010 as described above. The new permit requires a risk-based permitting approach, dependent upon the likely level of risk imparted by a project. The new permit also contains several additional compliance items, including (1) additional mandatory Best Management Practices (BMPs) to reduce erosion and sedimentation, which may include incorporation of vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/sediment/spill control plans, training, and other structural and non-structural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a Rain Event Action Plan; (5) requirements for the post-construction period; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics on site; and (8) mandatory training under a specific curriculum. Under the revised permit, BMPs will be incorporated into the compliance action and monitoring requirements for each development site, as compared to the existing permit, where specific BMPs are implemented via a SWPPP. Under the updated permit a SWPPP would be reviewed by the RWQCB. However, additional monitoring, reporting, and training requirements for management of storm water pollutants will also be implemented, unless the new permit is challenged and set aside prior to its implementation.

Local

Regional Water Quality Control Board

The Central Valley RWQCB is responsible for the protection of beneficial uses and the water quality of water resources within the Sacramento River Basin. The RWQCB administers the NPDES storm water permitting program and regulates storm water in this area, which includes the project area. Solano County is a permittee under the NPDES permit. The RWQCB also issues 401 certifications for projects that require a Section 404 permit from the USACE.

Solano County Water Agency

The SCWA maintains Ulatis Creek, west of Nut Tree Road to the city limit line. SCWA is also responsible for maintenance of the modified creeks downstream of the city (Vacaville, 2010).

Solano County General Plan

Nut Tree Airport is located entirely within the northeastern portion of the City of Vacaville. However, the airport is owned and operated by Solano County. The Solano County General plan was adopted on August 5, 2008. The Resources chapter (Chapter 4) of the General Plan provides information and policy guidance to Solano County to ensure that adequate public facilities and services are available now and in the future including water, wastewater and stormwater.

City of Vacaville General Plan

The City of Vacaville General Plan (Plan) was adopted in December of 2007 and serves as a comprehensive update of the 1980 General Plan. Currently, the City of Vacaville is in the General Plan Update process and it is anticipated that formal adoption of the updated General Plan will occur in 2013.

Conservation Element

The following goals from the *City of Vacaville General Plan's* Conservation Element are applicable to the Proposed Project:

> **Goal 8.1-G 4.** Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson and Ulatis Creek watersheds.

3.8.3 Analysis, Impacts, and Mitigation

Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. The Proposed Project was determined to result in a significant hydrologic, drainage, or groundwater impact if it would:

- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or project area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would cause substantial erosion and siltation and/or flooding onsite or offsite;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place structures within a 100-year flood hazard area which could impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

Methodology and Assumptions

This document provides an analysis of the Proposed Project, which characterizes the potential impacts in the areas of hydrology, water quality, and water resources. In support of this analysis, relevant information was gathered from the Nut Tree Airport, as well as other local, state, and federal water management agencies. Potential effects of the Proposed Project were assessed in comparison to a baseline of existing conditions, in accordance with the California Environmental Quality Act (CEQA), and impacts were identified in terms of relative significance, as discussed below. Mitigation measures were applied in order to minimize the effects of these impacts, as warranted.

Impacts and Mitigation Measures

Impact 3.8-1: Could the Proposed Project result in a violation of water quality standards or waste discharge requirements? (*Less Than Significant*)

Phase I Projects

The Proposed Project includes stabilizing the Runway Safety Area (RSA), shifting the runway and its associated utilities by 200 feet north, rehabilitating taxiways, adding an additional taxilane, and constructing solarized shade hangars. Other activities include refurbishment, replacement, or installation of lights, beacons, airfield perimeter fencing and gates, and signs and markings. Construction of these facilities could potentially result in the disturbance of surface soils and facilitate erosion on site. Additionally, the use of construction equipment could result in the release of greases, oils, coolants, hydraulic fluid, fuels, cement washout, and other construction-related contaminants into the environment. As a result, storm water could become contaminated by elevated sediment levels, or by elevated levels of other construction-related pollutants. Sediment from Proposed Project-induced on-site erosion can also accumulate in downstream drainage facilities, interfere with flow, and aggravate downstream flooding conditions.

Potentially significant construction related impacts would be reduced to less than significant with the implementation of BMP's provided under the NPDES General Construction Permit. As a condition of construction, the applicant would be required to obtain coverage under the NPDES Permit for Discharges of Stormwater Associated with Construction Activities (NPDES General Permit), under the RWQCB. Conditions of this permit would include adherence to requirements of the revised NPDES General Construction Permit, effective July 1, 2010. As discussed previously, permit requirements would include the following or equivalent measures:

- Preparation of a site-specific SWPPP;
- Preparation of hazardous material spill control and countermeasure programs;
- Stormwater quality sampling, monitoring, and compliance reporting;
- Development and adherence to a Rain Event Action Plan;
- Adherence to numeric action levels and effluent limits for pH and turbidity; monitoring of soil characteristics on site;
- Mandatory training under a specific curriculum; and

- Mandatory implementation of BMPs, which could include, but would not be limited to, as necessary:
  - Physical barriers to prevent erosion and sedimentation including setbacks and buffers, rooftop and impervious surface disconnection, rain gardens and cisterns, and other installations;
  - Construction and maintenance of sedimentation basins;
  - Limitations on construction work during storm events;
  - Use of swales, mechanical, or chemical means of storm water treatment during construction, including vegetated swales, bioretention cells, chemical treatments, and mechanical storm water filters; and
  - Implementation of spill control, sediment control, and pollution control plans and training.

Adherence to these and/or other similar BMPs would be required as a condition of the permit, and would substantially reduce or prevent waterborne pollutants from entering natural waters, per RWQCB standards, by putting into place measures intended to monitor and avoid construction-related water quality impacts. The specific set of BMPs would be determined prior to initiation of construction activities in the project area, and a schedule for implementation and monitoring and compliance measures, would be developed in coordination with the permitting agency, to meet state and federal water quality standards. Adherence to the NPDES General Construction Permit including the implementation of a SWPPP and associated BMPs will result in a less-than-significant erosion and sedimentation impact. No additional mitigation is required.

Project Build-out

Project build-out, including Phases II and III of the Proposed Project would include the construction and operation of approximately 7.32 acres of hangars and the remodeling and expansion of an existing administration building. Construction could result in soil disturbance and the release of contaminants into the environment. As with Phase I, the adherence to the NPDES General Construction Permit and the use of BMPs and preparation of a site specific SWPPP would ensure the protection of water quality. Therefore, the Proposed Project will result in a less-than-significant erosion and sedimentation impact. No additional mitigation is required.

Mitigation Measures: None required.

Impact 3.8-2: Could the Proposed Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level? (*Less Than Significant*)

Phase I Projects

As discussed above, the Project site lies in the Solano Subbasin, part of the Sacramento Valley groundwater basin, which is a 664 square mile groundwater basin. Phase I of the Proposed Project would result in addition of 18.59 acres of impervious surfaces from the shifting the runway and

its associated utilities by 200 feet north, constructing the South Corporate Hangar, expanding the South Apron, adding an additional taxilane that would connect Runway 20 to off-site industrial uses, and the construction of non-aviation uses. The increase in impervious surfaces represents 0.004% of the entire surface area of the groundwater basin. Given the proportion of the increase in the impervious surfaces as compared to the existing conditions and the groundwater basin, the Proposed Project would not cause a significant change over existing conditions as to affect groundwater recharge in the basin. The impact is therefore considered less than significant.

Project Build-out

Project build-out, including Phases II and III of the Proposed Project would include similar construction and operation impacts as Phase I. Phases II and III would result in an increase of impervious surfaces by and additional 8.36 acres. This increase would represent an additional 0.002% of the entire surface area of the groundwater basin. Therefore, the Proposed Project will result in a less-than-significant impact to groundwater levels and groundwater recharge.

Mitigation Measures: None required.

Impact 3.8-3: Could the Proposed Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or substantially increase the rate or amount of surface runoff, in a manner which would result in substantial erosion or siltation on- or off-site? (*Potentially Significant*)

Phase I Projects

Following Project implementation, most of the Project site would be converted to impervious surfaces. New impervious surfaces include pavement from shifting the runway and its associated utilities by 200 feet north, construction of the South Corporate Hangar, expanding the South Apron, construction of an additional taxilane, and development of the proposed non-aviation land uses. Areas that would remain pervious include portions of the Project area where new facilities are not slated, such as areas adjacent to the west side of the runway, areas around creeks, and the area north of the existing administration building (west of the proposed North Hangars).

During wet weather events, impervious surfaces typically do not allow for stormwater infiltration thereby creating higher sheet flows on impervious surfaces, as compared to pervious surfaces. As a result, larger volumes of storm runoff accumulate and higher rates of flow alter existing drainage patterns. Therefore, construction of impervious surfaces would result in a net increase in the rate and volume of surface runoff, potentially contributing to downstream flood impacts. Additionally, increases in stormwater runoff from the site could cause increased erosion and subsequent sedimentation downstream. Therefore this impact is considered potentially significant, and implementation of Mitigation Measure 3.8-1 is required.

Project Build-out

Project build-out, including Phases II and III of the Proposed Project would include similar construction and operation impacts as Phase I from the construction and operation of hangars, and

the extension of Runway 02/20. As with Phase I, a large portion of land would be converted to impervious surfaces and result in larger volumes of storm runoff potentially contributing to downstream flood impacts, sedimentation, and erosion. Implementation of Mitigation Measure 3.8-1 would ensure the Proposed Project would not result in impacts related to flooding and drainage. Therefore, the Proposed Project will result in a less-than-significant impact from erosion or siltation.

Mitigation Measure

Measure 3.8-1: Prepare a project drainage plan. In order to reduce potential impacts associated with all phases of development, the Applicant shall prepare and submit a Drainage Plan to the City engineer and the Central Valley Regional Water Quality Control Board for approval. The Drainage Plan shall include design/plan level depiction of all proposed stormwater drainage facilities such as vegetated swales, and/or detention basins. The following measures shall be implemented within the Drainage Plan, based on modeled runoff volumes and flow rates specific to with-Project conditions:

- The applicant shall design, implement, and maintain a stormwater retention and/or detention feature(s) such that there would be no net increase in project condition peak flows; and/or, with respect to the additional impervious surface area proposed for the project, the [applicant] shall design and implement volume- and/or flow-based Treatment Control Best Management Practices (BMPs) as defined in Attachment 4 (pages 5-6) of the State Water Resources Control Board (SWRCB) small municipal separate storm sewer systems (MS4s) General Permit (Small MS4 General Permit) (SWRCB Order 2003-0005-DWQ).

- Prior to implementation, design drawings and any related documents or specifications with respect to these required mitigation measures shall be submitted to the City of Vacaville and the Central Valley Regional Water Quality Control Board.

Impact Significance after Mitigation: Implementation of the proposed mitigation would ensure that project-related stormwater is appropriately managed in a manner that would reduce peak project flows to pre-project levels. In doing so, potential impacts related to on- and off-site erosion or siltation from stormwater runoff would be less than significant.

Impact 3.8-4: Could the Proposed Project substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? (*Potentially Significant*)

Phase I and Project Build-out

As described in previous impact discussions, full build-out of the Proposed Project would result in the creation of new impervious surfaces at Nut Tree Airport. The addition of the impervious surfaces would alter the existing drainage pattern of the site and increase the amount of surface runoff above current conditions. In order to offset potential on- and off-site flooding, implementation of Mitigation Measure 3.8-1 would be required. Adherence to this measure will

ensure that prior to project development, a project drainage plan is prepared. The plan would include design-level depictions of all proposed stormwater drainage facilities, such as vegetated swales and/or detention basins that would be required in order to capture storm water runoff from the new facilities. The development of such a plan will ensure that peak project flows are returned to pre-project levels, and potential impacts from on- or off-site flooding would be reduced to less-than-significant levels.

Mitigation Measure

> **Measure 3.8-2:** Implement **Measure 3.8-1**.
>
> **Impact Significance after Mitigation:** Implementation of the proposed mitigation would ensure that project-related stormwater is appropriately managed in a manner that would reduce peak project flows to pre-project levels. In doing so, potential impacts related to on- and off-site flooding from stormwater runoff would be less than significant.

Impact 3.8-5: Could the Proposed Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? (*Potentially Significant*)

Phase I Projects

As discussed under Impact 3.8-3, Project implementation would result in the creation of new impervious surfaces and potentially result in larger volumes of stormwater runoff that may exceed the existing or planned capacity of on-site water drainage systems. An increase in impervious surfaces could also result in the transport of water quality pollutants, including sediment, fuel residues, oils, and other pollutants associated with airport operations to downstream receiving waters (via Horse Creek) including Ulatis Creek and its tributaries and the Putah South Canal. However, implementation of Mitigation Measure 3.8-1 would reduce impacts associated with an increase in run-off associated with the construction of new impervious surfaces.

Impacts related to polluted runoff would be mitigated with the implementation of the construction and operational measures identified Impact 3.8.1, which includes implementation of water and other requirements prescribed by the NPDES Permit for Discharges of Stormwater Associated with Construction Activities (NPDES General Permit). Implementation of Mitigation Measure 3.8-1 and compliance with NPDES General Permit requirements would ensure that potential releases of sediment, oils, fuel, trash, and other potential water quality pollutants to natural waters would be minimized. Therefore, this impact is considered less-than-significant with mitigation.

Project Build-out

Project build-out, including Phases II and III of the Proposed Project would include the construction of additional hangars and a runway extension resulting in similar construction and operational impacts as Phase I related to stormwater flows and stormwater pollution. As with Phase I, implementation of Mitigation Measure 3.8-1 would reduce impacts from peak runoff volumes including sediment transport and conveyance, and/or exacerbate downstream flooding. In

addition, erosion and sedimentation control measures and BMPs, including compliance with NPDES General Permit Requirements as discussed for Impact 3.8-1 would be required. Therefore, the Proposed Project will result in a less-than-significant impact with mitigation to groundwater levels.

Mitigation Measure

> **Measure 3.8-3:** Implement **Measure 3.8-1**.
>
> **Impact Significance after Mitigation:** Implementation of the proposed mitigation would ensure that project related stormwater is appropriately managed in a manner that would not exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Impacts to on- and off-site drainage patterns after implementation of this measure are considered less than significant.

Impact 3.8-6: Could the Proposed Project otherwise substantially degrade water quality? (*Potentially Significant*)

Phase I Projects

As previously mentioned, connections to the existing stormwater drainage system would be constructed as part of the Proposed Project. The connection to the existing stormwater drainage system would reduce peak flows associated with the construction of new impervious surfaces to and would provide treatment of surface runoff prior to off-site discharge into Putah South Canal. Adherence to construction BMPs and implementation of Mitigation Measure 3.8-1 would ensure that any pollutant load carried by runoff headed to the Putah South Canal will be the same or less than existing baseline conditions. The Proposed Project would implement the BMPs as stated above under Impact 3.8.1 in order to ensure compliance with NPDES permit requirements. As such, with implementation of BMPs and previously described mitigation measures, the project would not otherwise substantially degrade water quality. Impacts associated with construction and operation of the Proposed Project would be less-than-significant with mitigation.

Project Build-out

Project build-out, including Phases II and III of the Proposed Project would include similar construction and operation impacts as Phase I. Project build-out would result in the construction of hangars that would connect to the existing stormwater drainage system. As with Phase I, implementation of Mitigation Measure 3.8-1 and the implementation of BMPs stated above under Impact 3.8.1 would reduce project impacts to water quality to less-than-significant with mitigation.

Mitigation Measure

> **Measure 3.8-4:** Implement **Measure 3.8-1**.

Impact Significance After Mitigation: Implementation of the proposed mitigation would prevent or reduce potential for the emission of water quality pollutants, and thereby reduce potential impacts associated with water quality degradation to less-than-significant levels.

Impact 3.8-7: Would construction of the Proposed Project result in placement of housing within a 100-year flood zone? (*No Impact*)

Phase I and Project Build-out

No phase of the Proposed Project includes the construction of any new housing. Therefore, no housing would be placed in a 100-year flood zone. No impact related to placement of housing within a flood zone would occur.

Mitigation Measures: None required.

Impact 3.8-8: Would implementation of the Proposed Project impede or redirect flood flows due to placement of new structures? (*Less Than Significant*)

Phase I Projects

The Proposed Project would not result in the construction of new structures within a FEMA-designated 100-year flood zone, and would not impede or redirect flows (see **Figure 3.8-1**). Phase I of the Proposed Project would include the closure of a portion of the taxiway system at the end of Runway 02; however, because this project element would not remove pavement, or result in the addition of new impervious surface, impacts related to the impediment or redirection of flood flows would not occur. Therefore, no new structures would be placed in a 100-year flood zone as a result of Phase I of the Proposed Project, and no impact related to placement of structures within a flood zone would occur.

Project Build-out

Project build-out, specifically Phase III of the Proposed Project, would include the extension of Runway 02/20 by 600 feet, which would result in a portion of the runway and associated taxiway system (approximately .7 acre of impervious surface) extending into a portion of the 100-year flood zone located to the northeast of the existing runway (see **Figure 3.8-1**). Construction of the runway extension could result in the redirection of 100-year flood flows to adjacent undeveloped areas located within the Airport. Measures to address this potentially significant impact would include raising the base elevation of future development out of the 100-year floodplain or the construction of drainage facilities, such as detention basins, to ensure that all floodwater levels will be equal to or less than existing levels. However, because the proposed extension is a Phase III project and no specific details for this area have been identified, it is not possible to state the specific design measures that would be used to accommodate the potentially significant flood risk. Nonetheless, based on the minimal area (approximately .7 acre) involved, the minor project flood elevation and the availability of design and construction measures to accommodate this

constraint for future development, floodplain impacts resulting from the proposed runway extension would be less than significant.

Other project elements that would traverse through 100-year flood zone (as identified in **Figure 3.8-1**), include the proposed land acquisition west of the runway. However, given that no proposed development is planned for this area, no impacts to floodplains would occur as a result of these projects elements.

In summary, potential impacts related to impeding or redirecting flood flows as a result of the full build-out of the Proposed Project are considered less than significant.

Mitigation Measures: None required.

Impact 3.8-9: Would the Proposed Project expose people or structures to significant risk of flooding due to levee or dam failure? (*No Impact*)

Phase I and Project Build-out

The Proposed Project is not located within the inundation zone of a levee or Dam (ABAG, 2012). Therefore, no impact would occur as a result of the Proposed Project.

Mitigation Measures: None required.

Impact 3.8-10: Would implementation of the Proposed Project result in increased risk of inundation by seiche, tsunami, or mudflow? (*No Impact*)

Phase I and Project Build-out

A seiche is a wave within a large, closed water body, such as a lake or large pond. A seiche may be instigated by seismic movements, or by a landslide into the water body or other mass movement that temporarily displaces a substantial volume of water. South Horse Basin #1 is located adjacent to the project area, however, it only stores water during major storm events and is not a permanent water storage basin. No major water bodies are located in the project area. The Proposed Project would not be located in areas subject to seiche, or alter existing water bodies such that the chances of seiche could increase.

Tsunami refers to a large scale ocean wave that is generated by an earthquake. Because the project area is located over 35 miles from the Pacific Ocean, the project would not increase the risk of inundation by a tsunami.

Mudflows occur in mountainous areas with unstable soils, or in areas where seismic or volcanic activity may induce the mass movement of water-saturated surface sediments. The project area has relatively flat topography, and no potential sources of mudflow nearby the Proposed Project, which could affect the project area, have been identified.

Therefore, implementation of the Proposed Project would result in no impact related to the risk of inundation by seiche, tsunami, or mudflow.

Mitigation Measures: None required.

Cumulative Impacts

Impact 3.8-11: Could implementation of the Proposed Project result in a cumulatively considerable impact to hydrology and water quality impacts? (*Potentially Significant*)

The geographic area for the analysis of cumulative impacts for hydrology and water quality is the Valley Putah-Cache watershed. The cumulative analysis considers the past, present, and probable future projects listed in Chapter 2 for cumulative impacts.

Phase I Projects

Concurrent construction of the Proposed Project and other cumulative projects could result in increased erosion and subsequent sedimentation, which could have a cumulative effect on the water quality of the receiving waters including the Putah South Canal. Any inadvertent release of fuels or other hazardous materials during concurrent construction of Projects could affect the water quality in the stream channels or storm drains that eventually flow into Ulatis Creek. Therefore the addition of either silt or sediment from construction activities from the Proposed Project combined with other projects in the watershed would have a significant cumulative effect. However, as described under Impacts 3.8-1 and 3.8-3 above, the Proposed Project's applicant would minimize the Proposed Project impacts by complying with the applicable water quality regulations including preparing and implementing a SWPPP; and installing BMPs and practicing control measures to manage and reduce erosion, stormwater runoff, and sedimentation downstream. This would also minimize any resulting flooding impacts from construction activities. The Proposed Project impact on water quality and flooding from construction would be less than significant. Given the existing developed nature of the Proposed Project vicinity, and other projects in the watershed, the Proposed Project would not result in a cumulatively considerable contribution toward the cumulative water impact from construction.

Project Build-out

Concurrent implementation of the Proposed Project and other cumulative projects could result in long term impacts related to water quality, and flooding from increased impervious areas. Addition of impervious surfaces from the Proposed Project along with other proposed developments could reduce infiltration thereby increasing storm runoff flows. The cumulative increase in impervious surfaces could cause a substantial increase in runoff, which if not controlled could result in a significant flooding effect downstream. However, the Proposed Project would incorporate design and treatment control measures to minimize long term stormwater impacts, including stormwater retention.

As described in Impacts 3.8-3 and 3.8-4, the Proposed Project would comply with the stormwater control requirements for flow and water quality and would have performance standards listed in the MS4 permit (e.g., the runoff rates from the project would be similar to pre-development rates and minimize stormwater pollutant to MEP), which would result in a less-than-significant impact. Therefore the Proposed Project would not result in a cumulatively considerable contribution toward the cumulative impact.

Mitigation Measure

Implement **Measure 3.8-1**.

Impact Significance after Mitigation: Implementation of the proposed mitigation proposed above would reduce the proposed project's contribution to potentially significant hydrology and water quality impacts to less-than-significant. They would reduce the proposed project's contribution to environmental impacts to less than cumulatively considerable.

3.8.4 References

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