3.3 Water Resources

This section provides a review of existing surface water and groundwater hydrology and water quality on and in the vicinity of the project site. This section also includes a review of drainage resources and flood-related hazard potential in the vicinity of the project site.

3.3.1 Setting

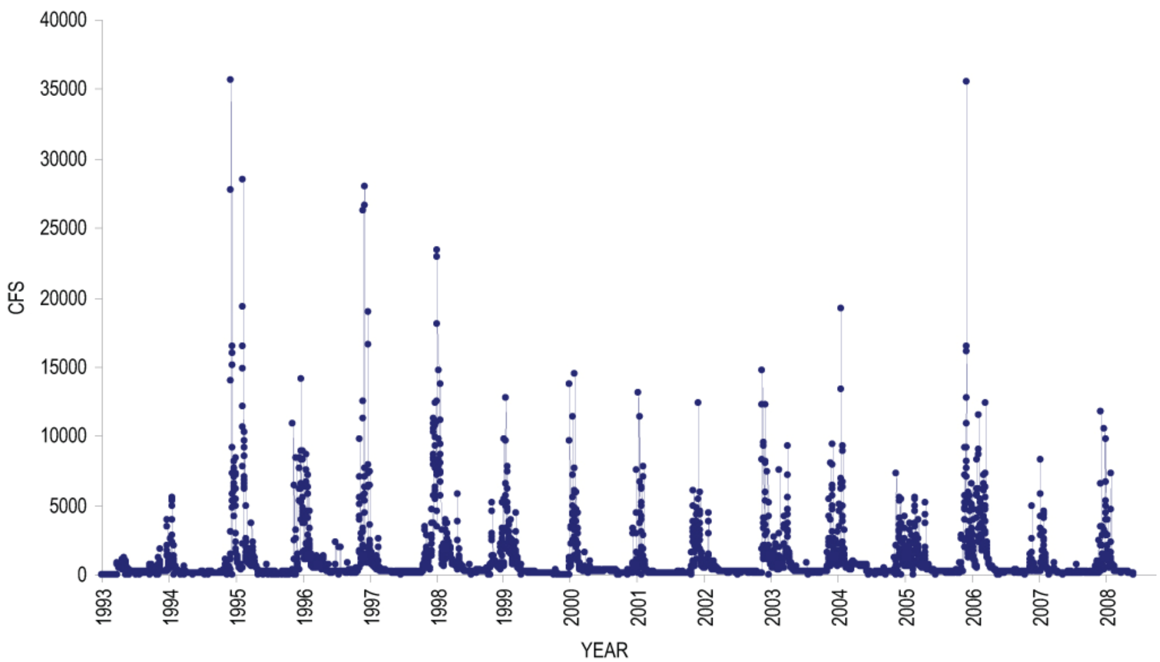
The project site is situated in the north end of the Alexander Valley (Cloverdale Valley), a narrow, north-south trending valley located within California's northern Coastal Ranges. Annual precipitation in the vicinity of the project area ranges from 40 to 44 inches (DWR, 2004). Water and drainage resources applicable to the project include surface waters of the Russian River and Porterfield Creek, and groundwater from an underlying groundwater basin. The Russian River and its tributaries are the primary surface water features in the vicinity of the project site. The following text provides a review of the existing hydrology and water quality, as relevant to the Russian River system and the project site.

Surface Water Hydrology

The Russian River and its tributaries drain an area that is approximately 100 miles long, 12 to 32 miles wide, and 1,485 square miles in area. The Russian River flows from its source (about 15 miles north of Ukiah) in a southerly direction through the Redwood, Ukiah, Hopland, and Alexander Valleys, and into the northwestern Santa Rosa Plain. From that point, the river turns westward and flows an additional 22 miles before discharging to the Pacific Ocean at Jenner. Big Sulfur Creek is the primary tributary in the vicinity of the project site; it merges with the Russian River just northeast of the City of Cloverdale. Other nearby tributaries include Oat Valley Creek, Icaria Creek, Barrelli Creek, and Porterfield Creek. Porterfield Creek, which flows between the east and west parcels of the project site, is an intermittent stream that carries storm runoff and limited spring baseflow from the uplands to the west.

Approximately 93 percent of the annual runoff within the Russian River system occurs from November to April (USACE, 1982), associated with Pacific frontal storms. Runoff during June through October is negligible, and ranged from about 0 to 20 cubic feet per second (cfs) prior to water development and management along the Russian River (e.g., before 1908); flows during this period were sustained by groundwater (Steiner Consulting, 1996). Installation of reservoirs in the Russian River basin, including Lake Mendocino (upstream of the project area along the East Fork of the Russian River) and Lake Sonoma (downstream and southwest of the project area), has substantially modified the natural flow regime of the Russian River, by decreasing the intensity of winter runoff and increasing flows during the summer months. Additionally, Pacific Gas and Electric (PG&E) has historically transferred about 150,000 acre-feet per year (af/yr) of water from the Eel River basin to the upper Russian River basin to support power generation and water supply. However, diversions from the Eel River into the upper Russian River basin have declined since 2004, due to Federal Energy Regulatory Commission revisions to the license for the interbasin transfer.

Today, flows in the Russian River are heavily managed, and include diversions from the Eel River, upstream dams for water supply, flood control, and power supply, as well as downstream diversions to aqueducts and other water supply infrastructure. Even under this substantial level of water management, flows in the Russian River remain highly variable. About 80 percent of the annual discharge occurs during winter (Entrix, 2002) and damaging floods have occurred relatively frequently along the river. The Russian River basin is characterized by a rapid hydrologic response to rain events, and flash floods are relatively common. **Figure 3.3-1** provides a summary of flows in the Russian River near Cloverdale, upstream of the confluence of the Russian River with Sulfur Creek (DWR, 2008). As shown, winter flows range up to several orders of magnitude greater than summer flows. Additionally, **Figure 3.3-2** shows average November through April flows in comparison to average May through October flows, for 1997 through 2008.



Source: DWR (2008).

Cloverdale Rancheria Casino Project. 207737

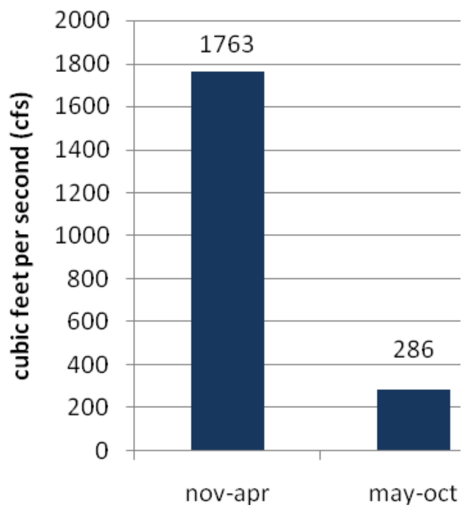
Figure 3.3-1
Russian River Near Cloverdale, Average Daily Flow
1993-2008 (Cubic Feet per Second)

Supplemented by PG&E's conveyances from the Eel River and dry-season reservoir releases, the Russian River flows year-round in the vicinity of the project site. The river provides agricultural water to users in Sonoma County, and also provides recharge water to underlying groundwater aquifers. River water is also supplied to Sonoma County Water Agency, municipalities, small domestic, and industrial water users.

National Marine Fisheries Services (NMFS) recently completed a review of operations along the Russian River watershed, which are implemented by the US Army Corps of Engineers (USACE) and undertaken by Sonoma County Water Agency and Mendocino County Russian River Flood Control and Water Conservation Improvement District (NMFS, 2008). The Biological Opinion completed by NMFS addresses the status of fisheries along the Russian River, in response to operational changes that have resulted from past and ongoing implementation of the Russian River Water Supply and Flood Control Project (RRWSFC Project). The Biological Opinion analyzes the implementation current operations of the RRWSFC Project over the ensuing 15 years, including as relevant to analysis of hydrologic effects for the proposed action, (1) non-flood water supply releases; (2) estuary management procedures; (3) channel maintenance procedures; (4) reservoir flood control operations at Coyote Valley Dam and Warm Springs Dam; and (5) hydroelectric power generation at Coyote Valley Dam and Warm Springs Dam. Note that the Biological Opinion included an assessment of present operating conditions for 15 years; the hydrologic regime shown in **Figure 3.3-1** reflects these operations as implemented to date.

Surface Water Quality

Surface water quality in the Russian River in the vicinity of the project area depends on upstream reservoir releases, surface water diversions, return flows/discharges to the river, stormwater inflow, and other factors. Of particular importance in protecting fisheries resources in the river are temperature and dissolved oxygen (DO). These two constituents are interdependent, in that increased temperatures can substantially reduce DO concentration. Temperature is in turn influenced by releases from upstream reservoirs, both by the temperature of the water released and the volume of water in the river. As in-stream water volumes decrease, water temperature becomes more readily influenced by ambient air temperatures, and may warm substantially. This warming can, in turn, result in a reduction in DO concentration. In general, low DO conditions occur during warm months of dry or critically dry years, when flow is low and ambient temperature is high (Entrix, 2002).



Cloverdale Rancheria Casino Project. 207737

Figure 3.3-2
Average November-April and May-October Russian River Flows, 1997-2008

The Russian River is considered a sensitive water body, and is listed on the State 303(d) list of impaired water bodies. Listed impairments relevant to the Proposed Action and alternatives include nutrients, pathogens, and sedimentation/siltation.

Groundwater Hydrology

The project site is located in the Cloverdale Area Subbasin of the Alexander Valley Groundwater Basin. The subbasin has a total surface area of approximately 10 square miles, and occupies a structural depression in the Coast Ranges near the northern end of Sonoma County. The subbasin boundary extends from Alderglen Springs and Preston in the north, to about one mile south of Asti, concurrent with a reduced section of water bearing sediments (DWR, 2003). The Russian River flows in a southerly direction along the entire length of the subbasin, and is joined by Big Sulphur Creek at the north end of the Cloverdale Valley. DWR (1983) estimated the groundwater storage capacity of the subbasin to be approximately 71,000 acre-feet (af); however, no reliable estimate of the subbasin's groundwater budget is available (DWR, 2003; USGS, 2006). A study completed by US Geological Survey indicated that approximately 20 to 30 known wells were drilled in the vicinity of the City of Cloverdale and the project between 1950 and 2004 (USGS, 2006).

Available groundwater in the Cloverdale Area Subbasin is primarily associated with Quaternary Alluvial formations. This geologic unit which consists of unconsolidated sand, silt, clay, and gravel underlies the Russian River and its tributaries. The thickness of Quaternary Alluvium ranges from less than 10 to more than 80 feet; groundwater yields from specific wells may be dependent upon a well's intersection with prehistoric (buried) Russian River channels, as wells located away from the river generally have lower yields. Irrigation wells screened in these alluvial formations typically yield production rates of 50 to 200 gallons per minute (gpm; DWR, 2003).

The Franciscan Complex is the other primary geologic formation in the vicinity of the project, and consists of weakly to strongly metamorphosed rocks, including mainly of sandstone and shale, with some serpentinite, greenstone, chert, and schist layers. Generally speaking, Franciscan rocks are commonly considered to be non-water bearing within California's Coastal Range (USGS, 2006 and references therein). However, some areas of the Franciscan Complex contain limited water-bearing layers, which are characterized by many fractures. Well yields in the Franciscan Complex are generally low, although production rates may be sufficient to sustain small domestic uses (DWR, 2003). Drill logs of wells on site indicate that the Franciscan Complex lies below approximately 50 to 70 feet of alluvium.

Groundwater level in the subbasin appears to be relatively stable. A survey of three wells in the area indicates substantial annual variation in groundwater levels, but do not indicate a significant long term change in water levels (DWR, 2003, 1983). The City of Cloverdale relies on groundwater to supply its annual usage, and as of 2000, pumped approximately 2.4 million gallons per day (mgd) (DWR, 2003). DWR records indicate that domestic wells in the subbasin typically range from 20 to 420 feet depth below ground surface (bgs), while municipal and irrigation wells typically range from 30 to 220 feet bgs (DWR, 2003). A review of groundwater data available from 1967 through 2004 by the US Geological Survey indicated seasonal fluctuation in groundwater levels in the vicinity of the project on the order of 1 to 10 feet. Overall, groundwater levels appear to be stable over this period, and no substantial increasing or decreasing trend was observed (USGS, 2006).

Groundwater beneath the project site is present in the alluvium and underlying bedrock. The only formation capable of providing significant quantities of groundwater is the younger alluvium and river channel deposits. The Franciscan Bedrock in this area tends to have a low specific yield. Although depths and thicknesses of the alluvium and bedrock vary beneath the site, especially east of Porterfield Creek where alluvial thicknesses are greater and bedrock is deeper, a generalized lithology can be described as topsoil (approximately 4 to 12 feet deep) underlain by an unsaturated zone of clay and gravel mixtures (3 to 11 feet thick), overlying a unit of river sands, gravels and cobbles (8 to 70 feet thick) underlain by a clay unit (12 to 36 feet thick) overlying a sandstone/siltstone bedrock. Groundwater occurs under unconfined conditions in the alluvial coarse-grained materials. Groundwater levels fluctuate seasonally and are controlled by seasonal rainfall, runoff from up-gradient, adjacent upland areas to the west and east of the property, and the surface flow in the Russian River. Based on review of groundwater elevation data provided during previous investigations, groundwater depths range from about 6 feet below ground (bgs) surface to 23 feet bgs (measurements taken in May 2008). Groundwater flow beneath the project site follows the general surface topography and flows in an east-northeasterly direction towards the Russian River. The Russian River in this area is a gaining stream meaning that groundwater from adjacent land areas flows into the river from adjacent upland areas.

There are eight groundwater production wells on the project site, all located on the vineyard parcel east of Porterfield Creek. Three of these wells are owned and operated by the South Cloverdale Water District (SCWD). Currently, only one of the three SCWD wells is operating. There are four irrigation wells, including one that serves the Lile Vineyard on the west side of Highway 101. Two of these irrigation wells are currently operating and are providing irrigation water for the existing vineyards. One well, the "6-acre Water Company" well serves about 24 residences located adjacent to the project site. The existing wells on-site have perforated screens placed at various intervals above the alluvial/bedrock interface, no deeper than 80 feet bgs.

A Water Supply Report (**Appendix I**) was completed for the Proposed Action and alternatives, and included an assessment of utilizing groundwater from the project site for a potable water supply. As discussed in further detail in **Chapter 2.0**, the proposed water supply well would be located on the southeastern parcel (APN 116-310-005), approximately 200 feet southwest of the western bank of the Russian River, and within the 100-year floodplain of the Russian River. A study completed in support of the Water Supply Report included testing of an existing irrigation well, the Tyris Company Well, which is located in the area of the proposed water supply well. As required by the Sonoma County Permit and Resource Management Department (SCPMRD), the Tyris Company Well was pumped for eight-hours at 100 gallons per minute (gpm) during a dry weather pump test on December 8, 2008. This well is screened in the alluvial layer above the underlying Franciscan complex to a depth of approximately 70 feet. Results indicated a total and constant drawdown of 1.7 feet during the test period, and a 100 percent recovery within minutes of the cessation of pumping. The specific capacity of the well was calculated to be 59 gpm per foot of drawdown. (County of Sonoma, 2008)

Groundwater Quality

The groundwater of the Cloverdale Area Subbasin of the Alexander Valley Groundwater Basin is generally characterized as moderately hard to hard[1]. Based on data from four wells, total dissolved solids (TDS) ranges from 130 to about 300 mg/L, with electrical conductivity ranging from about 180 to 454 micromhos/cm (DWR, 1983). While groundwater in the area is generally suitable for all uses, relatively high boron levels, exceeding 0.5 mg/L, may contribute to reduced crop yields (DWR, 1983). A Phase II assessment included a review of groundwater sampling data completed on

[1] Hardness is a measure of the content of specific minerals in water, including primarily calcium and magnesium. Elevated hardness can cause the formation of scales, calcification on pipes, and reduced generation of suds in soapy water.

site. Results from these samples are compiled in **Table 3.3-1**, along with the relevant USEPA maximum contaminant level (MCL) for drinking water. As shown, none of the measured constituents exceeded an applicable MCL. Note that **Table 3.3-1** provides a summary of the maximum detected values for the indicated water quality constituents on site, as well as a review of relevant MCLs. The reader is referred to the Phase II report for the project for additional detail (**Appendix K**).

TABLE 3.3-1
US EPA MAXIMUM CONTAMINANT LEVELS FOR DRINKING WATER

Constituent	Highest Detection	Primary MCL	Secondary MCL	Units
Primary Inorganics				
Antimony	<0.006	0.006		mg/L
Arsenic	<0.002	0.01		mg/L
Barium	0.2	2		mg/L
Beryllium	<0.001	0.004		mg/L
Cadmium	<0.001	0.005		mg/L
Chromium (total)	<0.001	0.1		mg/L
Copper	0.0058	1.3		mg/L
Mercury	<0.001	0.002		mg/L
Nitrate (as N)	n/m	10		mg/L
Nitrite (as N)	n/m	1		mg/L
Selenium	<0.005	0.05		mg/L
Thallium	<0.001	0.002		mg/L
Secondary Inorganics				
Aluminum	n/m		0.05 to 0.2	mg/L
Chloride	n/m		250	mg/L
Color	n/m		15	color units
Copper	n/m		1	mg/L
Corrosivity	n/m		non-corrosive	n/a
Fluoride	n/m		2	mg/L
Foaming agents	n/m		0.5	mg/L
Iron	n/m		0.3	mg/L
Manganese	n/m		0.05	mg/L
Odor	n/m		3	threshold odor number
pH	n/m		6.5-8.5	pH units
Silver	<0.01		0.1	mg/L
Sulfate	n/m		250	mg/L
Total Dissolved Solids (TDS)	n/m		500	mg/L
Zinc	0.0096		5	mg/L
Bacteriological Constituents				
E. coli	110			MPN/100mL
Radiological Constituents				
Alpha Particles	n/m	15		picocuries per Liter
Beta Particles and Photon Emitters	n/m	4		millirems per year
Radium 226 and 228	n/m	5		picocuries per Liter
Uranium	n/m	0.03		mg/L
Pesticides and Volatile Organic Compounds (VOCs)				

TABLE 3.3-1
US EPA MAXIMUM CONTAMINANT LEVELS FOR DRINKING WATER

Constituent	Highest Detection	Primary MCL	Secondary MCL	Units
Alachlor	n/m	0.002		mg/L
Atrazine	n/m	0.003		mg/L
Benzene	n/m	0.005		mg/L
Benzo(a)pyrene	n/m	0.0002		mg/L
Carbon tetrachloride	n/m	0.005		mg/L
Diquat	n/m	0.02		mg/L
Vinyl chloride	n/m	0.002		mg/L
Xylenes	n/m	10		mg/L

KEY: n/m: not measured; n/a: not applicable; mg/L: milligrams per Liter; MPN: most probable number; ESA, 2009; USEPA, 2003

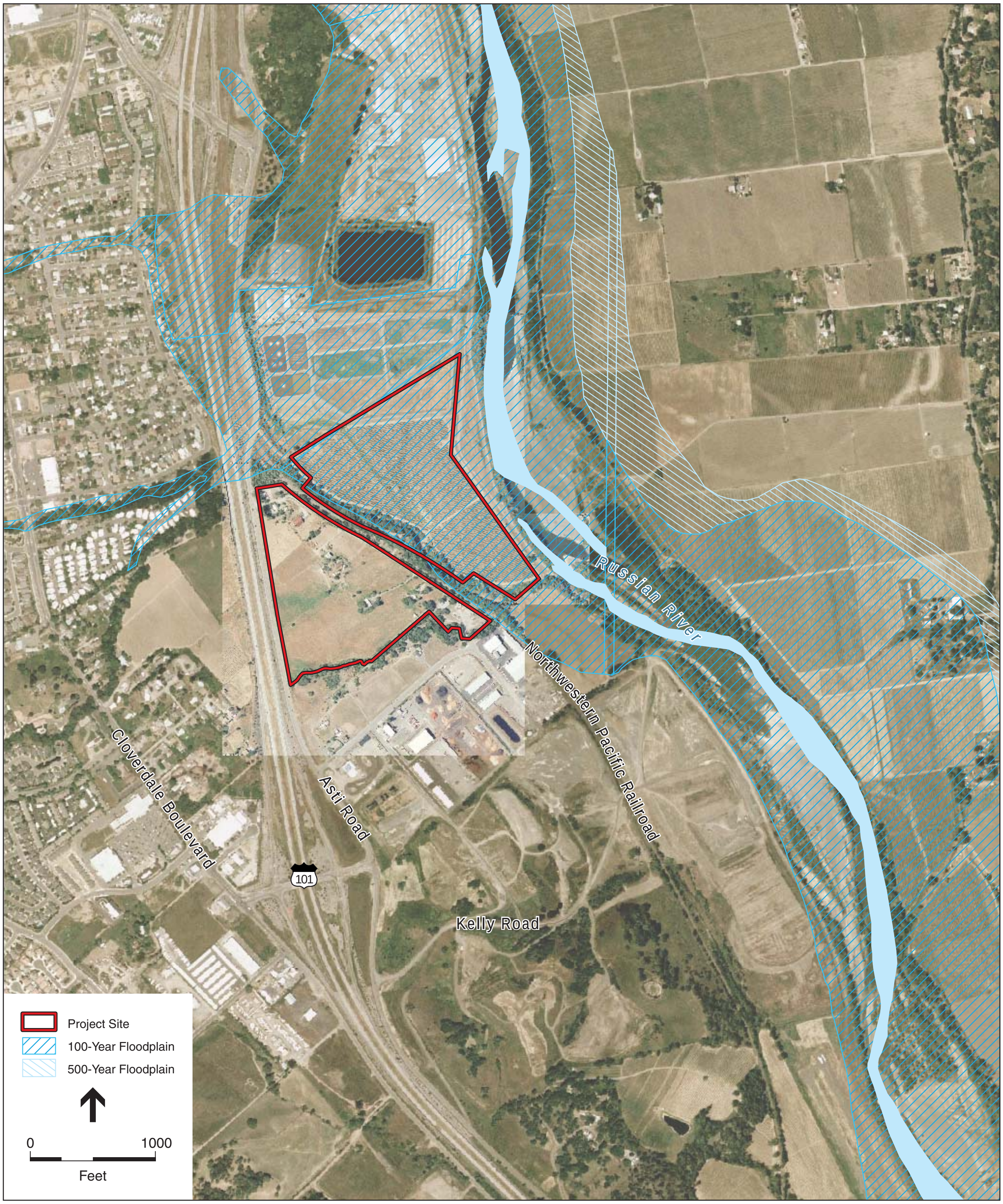
Flooding and Drainage

Flooding of the Russian River

Periodic flooding along the Russian River has, in the past, caused substantial damage to Sonoma County economic resources since the mid-1930s (SCWA, 1999). To prevent flooding, Sonoma County Water Agency and the U.S. Army Corps of Engineers have installed several flood control devices along the Russian River and its tributaries. These include Coyote Dam, Spring Lake Park, Warm Springs Dam, and various storm channeling and drainage systems in the Sonoma Valley.

The Federal Emergency Management Agency (FEMA) provides information of flood hazard and flooding frequency on its Flood Insurance Rate Maps (FIRMs), and identifies designated zones of flood hazard potential. FEMA-delineated flood zones for the project site are shown on **Figure 3.3-3**. As shown, approximately half of the project site (the area located to the northeast of the railroad line), is located within a delineated 100-year flood zone[2]. The indicated 100-year flood results primarily from run-on to the site from the Russian River, to the south of the project site. While some stormwater run-on to the site from the vicinity of US 101 and other areas to the north of the project site would be anticipated to occur, flooding associated with the Russian River is anticipated to be the primary driver of flooding on-site.

[2] The 100-year flood zone, as defined by FEMA, consists of the land area that has a one percent annual chance of being inundated by floodwaters.



SOURCE: FEMA, 2005; ESRI, 2006; and ESA, 2008

Cloverdale Rancheria Resort Casino Project EIS . 207737

Figure 3.3-3
Flood Zones

Drainage Patterns of the Project Site

The northeastern parcels of the project site are presently under agricultural use (vineyards), while the southwestern parcels are primarily agricultural and rural residential. Drainage on both the northeastern and southwestern parcels is provided by existing agricultural ditches, as well as Porterfield Creek, which flows in a southeasterly direction along the western boundary of the northeastern parcel. Coyote Creek flows in an easterly direction along the southern edge of the southwestern parcels, crosses under the railroad via an existing culvert, and joins with Porterfield Creek before discharging into the Russian River near Kelly Road.

Drainage from the northeastern parcel, which is currently planted as a vineyard, generally flows from north to south. Surface runoff from the northern half of the vineyard either infiltrates into the groundwater basin or flows into Porterfield Creek and/or the Russian River (depending on location and volume of flows). Runoff from the southern half of the vineyard is channeled via natural low points into Porterfield Creek near the southeast corner of the vineyard.

Stormwater drainage from the southwestern parcels flow off-site via four culverts. Sheet-flow runoff occurs along the northwestern end of the parcels, the easternmost portion of the parcels, and along the southern boundary of the parcels, adjacent to Coyote Creek. Two of the existing culverts, located along the northeastern boundary of the parcels, pass under the railroad tracks and discharge indirectly to Porterfield Creek. The northern culvert is 18 inches in diameter and discharges into an area showing highly erodible soil conditions.

Stormwater

Drainage from areas located off-site is channeled onto or across the project site at several places, but primarily along its northern and western boundaries. These include areas where stormwater run-on (e.g., the flow of stormwater onto the project site) occurs associated with Heron Creek, as well as stormwater discharges from US 101 and the foothill areas to the west.

Substantial stormwater run-on occurs along the northern end of the site associated with Heron Creek, which has a watershed area of over 1,000 acres. Prior to the construction of US 101, this creek flowed along the west side of the City's WWTP and joined Porterfield Creek near the northwest corner of the site. However, during construction of US 101, Porterfield Creek was altered and caused flooding north of the site (specifically, north and west of the City's WWTP).

In addition to run-on associated with Heron Creek, additional stormwater flows are channeled onto the site via two existing, 30-inch culverts that discharge runoff from US 101 and the foothill areas to the west of US 101. The culverts discharge water at the west boundary of the project site, and the tributary area for each is approximately 20 acres.

3.3.2 Regulatory Setting

Executive Order 11988

Under Executive Order 11988, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year (i.e., the 100-year floodplain). FEMA requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. FEMA 100-year and 500-year floodplains are shown in **Figure 3.3-3**.

Clean Water Act

The Clean Water Act (CWA) (CWA, 33 USC 1251-1376) is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important applicable sections of the act are:

- Sections 303 and 304, which provide for water quality standards, criteria, and guidelines.
- Section 401, which requires an applicant for any federal permit that proposes an activity that may result in a discharge to "waters of the United States" to obtain certification from the state that the discharge will comply with other provisions of the Act. In California, certification is provided by the State Water Resources Control Board (SWRCB), but would fall under EPA jurisdiction (Region IX) for the Proposed Action and alternatives.
- Section 402, which establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. In California, this permit program is administered by the Regional Water Quality Control Boards, but would fall under EPA jurisdiction (Region IX) for the Proposed Action and alternatives.
- Section 404, which establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is administered by the Army Corps of Engineers (Corps).

Federal Safe Drinking Water Act

The Safe Drinking Water Act was established to protect the quality of waters actually or potentially designated for drinking use, whether from above ground or underground sources. Contaminants of concern in a domestic water supply are those that either pose a health threat or in some way alter the aesthetic acceptability of the water. Primary and secondary maximum contaminant levels (MCLs) are established for numerous constituents of concern including turbidity, total dissolved solids (TDS), chloride, fluoride, nitrate, priority pollutant metals and organic compounds, selenium, bromate, trihalomethane and haloacetic acid precursors, radioactive compounds, and gross radioactivity.

The law was amended in 1986 and 1996, and its implementation is overseen by the EPA. As such, the EPA is authorized to set national health-based standards for drinking water to protect against natural and man-made contaminants in drinking water (EPA, 2006). Any groundwater wells developed on the site would be subject to regulation under the Safe Drinking Water Act and oversight by the EPA.

State and Local

While the following state and local regulations would not be directly applicable to the project site (as the site would become lands held in trust by the Federal government subject to EPA oversight), a discussion is provided to summarize the current off-site (and downstream) regulatory setting.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, as revised in December, 2007, provides for protection of the quality of all waters of the state for use and enjoyment by the people of California. It further provides for regulation of all activities that may affect the quality of waters of the state, in order to obtain the highest water quality that is reasonable, considering all demands on those waters. The Act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by inter-basin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. Within this framework, the Act authorizes the State Water Resources Control Board and regional boards to oversee responsibility for the coordination and control of water quality within California. Only water quality effects to lands outside of the project site would be subject to regulation under the Porter-Cologne Water Quality Control Act.

North Coast Regional Water Quality Control Board and Basin Plan

The Porter-Cologne Act provides for development of Water Quality Control Plans (Basin plans) that designate beneficial uses of California's major rivers and groundwater basins, and establish water quality objectives for those waters. Beneficial uses represent the services and qualities of a water body (e.g. the reasons why it is considered valuable), while water quality objectives represent the standards necessary to protect and support those beneficial uses. Basin plans provide the technical basis for determining waste discharge requirements and taking regulatory enforcement actions if deemed necessary. Note that, because the project site would be taken into trust by the Tribe, the North Coast Regional Water Quality Control Board's (NCRWQCB) jurisdiction would be limited to lands that are located outside of the project site.

The NCRWQCB, which is one of nine regional water quality control boards overseen by the State Water Resources Control Board, is the state agency that oversees these operations in the North Coast Region. The NCRWQCB has adopted the Water Quality Control Plan for the North Coast Region (Basin Plan; NCRWQCB, 2007), which establishes surface water quality objectives and parameters for color, tastes and odors, floating material, suspended material, settleable material, oil and grease, biostimulatory substances, sediment, turbidity, pH, dissolved oxygen, bacteria, temperature, toxicity, pesticides, chemical constituents, and radioactivity for all surface waters within its region.:. The Basin Plan also specifies groundwater quality objectives for tastes and odors, bacteria, radioactivity, and chemical constituents. **Table 3.3-2** shows additional specific surface water quality objectives for the Russian River Hydrologic Unit in the vicinity of the project area, as defined by the NCRWQCB (2007).

TABLE 3.3-2
SURFACE WATER QUALITY OBJECTIVES FOR THE RUSSIAN RIVER HYDROLOGIC UNIT IN THE VICINITY OF THE PROJECT SITE

Constituent	Objective Type	Value
Specific Conductance	90 Percent Upper Limit[1]	320
(micromhos)	50 Percent Upper Limit[2]	250
Total Dissolved Solids	90 Percent Upper Limit[1]	170
(mg/L)	50 Percent Upper Limit[2]	150
Dissolved Oxygen	Minimum	7.0
(mg/L)	90 Percent Lower Limit[1]	7.5
	50 Percent Lower Limit[2]	10.0
Hydrogen Ion	Maximum	8.5
(pH)	Minimum	6.5

1 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.
2 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

SOURCE: NCRWQCB, 2007

As defined by the NCRWQCB, the project site is located in the Geyserville Hydrologic Subarea of the Middle Russian River Hydrologic Area, which is a portion of the Russian River Hydrologic Unit. As such, the Basin Plan identifies the following existing beneficial uses for the Russian River in the vicinity of the project site: Municipal and Domestic Supply, Agricultural Supply, Industrial Service Supply, Groundwater Recharge, Freshwater Replenishment, Navigation, Water Contact Recreation, Non-Contact Recreation, Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, Rare/Threatened/Endangered Species, Migration of Aquatic Organisms, and Spawning/Reproduction/Early Development. Additionally, the Basin Plan identifies the following potential beneficial uses for the Russian River in the vicinity of the project site:

- Industrial Process Supply,
- Hydropower Generation,
- Shellfish Harvesting,
- and Aquaculture.

Because the project site would be taken into trust, application of Basin Plan standards would only be considered only for those impacts that may occur off the project site.

Porter-Dolwig Ground Water Basin Protection Law

The Porter-Dolwig Ground Water Basin Protection Law (California Water Code §12920 et seq.) gives the DWR authority to initiate or participate in investigations, studies, plans and design criteria for projects to prevent degradation of groundwater throughout the State. The law authorizes the DWR to evaluate, review if necessary, and provide technical assistance to the local agency if necessary. Sections 12923 and 12924 state that DWR shall, in conjunction with other public agencies, conduct an investigation of the state's groundwater basins. The DWR shall identify the state's groundwater basins on the basis of geological and hydrological conditions and consideration of political boundary lines whenever practical. The DWR shall also investigate existing general patterns of groundwater pumping and groundwater recharge within such basins to the extent necessary to identify basins which are subject to critical conditions of overdraft. Because the project site would be taken into trust, this law would not be applicable to the project site. However, it provides a regulatory context for the surrounding area.

California Department of Health Services Drinking Water Regulations

California's Department of Health Services (DHS) serves as the primary responsible agency for drinking water regulations. DHS must adopt drinking water quality standards, for surface and groundwater, at least as stringent as Federal standards (as described above), and may also regulate contaminants to more stringent standards than the EPA, or develop additional standards. DHS regulations cover over 150 contaminants, including microorganisms, particulates, inorganics, natural organics, synthetic organics, radionucleides, and DBPs. The California DHS is responsible for enforcement of drinking water regulations in the State of California, and would have jurisdiction over activities located in the surrounding area. As described above, drinking water standards on the project site would be regulated by the EPA.

North Coast Integrated Regional Water Management Plan

Phase I of the North Coast Integrated Regional Water Management Plan (IRWMP; North Coast Regional Partnership, 2007) has been completed by a consortium of county and city agencies, Tribal representatives, and resources conservation and other private entities, located along the Northern California Coastal Range and southern Cascades, from Santa Rosa north to Crescent City, and from Eureka east to Modoc County, including the project site. Primary objectives of the IRWMP include conservation and restoration of habitats to support native salmon; protection and enhancement of drinking water quality; assurance of water supply while protecting the environment; support for NCRWQCB programs and their implementation; address environmental justice and public health issues; and provide an ongoing, inclusive framework for intra-regional cooperation, planning, and project implementation. To this end, the IRWMP 1) identifies related existing conditions and issues concerning water resources, 2) describes a suite of projects that would facilitate realization of IRWMP objectives, and 3) provides an assessment of potential benefits and impacts associated with implementing projects in area surrounding the project site. The project site would not be subject to the provisions of the IRWMP, but it provides a regulatory context for the surrounding area.

References

California Department of Water Resources (DWR), 1983. Evaluation of Ground Water Resources: Sonoma County: Bulletin 118-4, Volume 5: Alexander Valley and Healdsburg Area.

California Department of Water Resources (DWR), 2003. California's Groundwater Bulletin 118.

California Department of Water Resources (DWR), 2008. Department of Water Resources California Data Exchange Center. Station ID: CLV; Sensor Number: 41. Available at: http://cdec.water.ca.gov/.

County of Sonoma, Permit and Resource Management Department, 2008 Certification of Water Yield in Water Scarce Areas, Pump Test Worksheet completed by Dave Lowman. 505 Lile Lane, Cloverdale California, Well Permit 020644, December.

Entrix, 2002. Russian River Biological Assessment. Interim Report 3: Flow Related Habitat. April 5, 2002.

Miller, J.F., Frederick, R.H., and Tracey, R.J., 1973 [1974], California, v. 11 *of* Precipitation frequency atlas of the Western United States: U.S. Department of Commerce, National Oceanic and Atmospheric Administration Atlas 2, 71 p.

North Coast Regional Partnership, 2007. North Coast Integrated Regional Water Management Plan, Phase 1. July 2007.

North Coast Regional Water Quality Control Board (NCRWQCB), 2007. Water Quality Control Plan for the North Coast Region. January 2007.

Sonoma County Water Agency, 1999. Biannual Report: Fifty Years of Caring for Sonoma County's Water Resources.

Steiner Environmental Consulting, 1996. A history of the salmonid decline in the Russian River. Steiner Environmental Consulting, Sonoma County Water Agency, California State Coastal Conservancy.

US Army Corps of Engineers (USACE), 1982. Russian River Basin Study Northern California Streams Investigation Final Report. San Francisco District, San Francisco, CA.

US Environmental Protection Agency (USEPA), 2006. Safe Drinking Water Act Basic Information. Available at: http://www.epa.gov/safewater/sdwa/basicinformation.html.