2 Existing Conditions

The following chapter describes the baseline physical setting, environmental characteristics of the hydrologic units and existing regulations of the North Coast Region. Section 2.1 below describes the environmental setting for the region and Section 2.2 below generally describes the current regulatory framework associated with implementation of the objectives for chemical constituent, toxicity, and dissolved oxygen. This chapter generally describes these existing conditions and does not describe all existing laws, regulations and policies under the purview of the Regional Water Board. The descriptions of the regulatory programs are specific to the water quality objectives being discussed. For example the cleanup program is discussed as it relates to the objectives for chemical constituents and groundwater toxicity, while the timber harvest program is discussed in relation to the objective for DO.

2.1 Environmental Setting

The environmental setting of a proposed project establishes the baseline condition against which potential environmental impacts of the proposed project are compared. The proposed project is designed to address existing or potential impacts to water quality within the Region with the goal of improving water quality for the protection of human health, recreation, aquatic life, and ecosystem function. As a programmatic analysis, this chapter provides a general description of the Region, highlighting the key factors identified in the CEQA analysis including: aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.

The North Coast Region comprises all basins including Lower Klamath Lake and Lost River Basins draining into the Pacific Ocean from the California-Oregon state line southerly to the southerly boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties[1]. The region is divided into two natural drainage basins: 1) the Klamath River sub-basin which drains the Cascade Range Geomorphic Province, the Modoc Plateau Geomorphic Province and the Klamath Mountain Geomorphic Province and 2) the North Coastal sub-basin which drains the Coast Range Geomorphic Province. The North Coast Region covers all of Del Norte, Humboldt, Trinity, and Mendocino counties, major portions of Siskiyou and Sonoma counties, and small portions of Shasta, Glenn, Lake, and Marin counties.

The North Coast Region encompasses a total area of approximately 19,390 square miles (mi^2), including 340 miles of scenic coastline, 362 miles of designated Wild and Scenic Rivers, 416 mi^2 of National Recreation Areas, and 1,627 mi^2 of National Wilderness Areas, as well as urbanized, forested, and agricultural areas. The region is characterized by steep,

[1] Wat. Code § 13200 subdivision (a).

mountainous forested terrain with distinct temperature and precipitation zones. The mountain crests, which form the eastern boundary of the region, are about 6,000 feet in elevation with a few peaks higher than 8,000 feet. Much of the region is mountainous and rugged; only 13 percent of the land is classified as valley or mesa, and more than half of that is in the higher- elevation northeastern part of the region in the upper Klamath River Basin. The coast is mild, foggy and produces moderate variations in seasonal temperatures. Coastal redwoods and Douglas fir-tanoak forests dominate this landscape. Inland areas outside of the coastal influence undergo more extreme seasonal temperature variation with seasonal maximums exceeding 100 ºF. Oaks and pines interspersed with grasslands and chaparral are more common inland.

The U.S. Geological Survey (USGS) published in 1998 a report entitled "The Status and Trends of the Nation's Biological Resources." What follows are excerpts from this report for northwestern California[2].

> "Northwestern California has the wettest, most consistent climate in the state. It is composed mainly of the coastline and several metamorphic mountain ranges, including the Klamath Mountains and the north Coast Ranges. The coastal region, from the Oregon border south to Bodega Bay, is dominated by areas of coastal prairie, some coastal marsh, closed-cone pine and cypress forests on poor soils, and grand fir–Sitka spruce forests on better soils (Hickman 1993). Many of the cypress groves are associated with chaparral, rock outcrops, or serpentine soils. The closed-cone pines are generally small in stature and, like the cypresses, are associated with chaparral, fire, and shallow, acidic, nutrient-poor soils, often serpentine or sandstone. These pines are short-lived (50–100 years), and their seeds can only germinate on bare mineral soils. Like the cypresses, the closed-cone pines require fire for successful reproduction. Knobcone pine is the most widespread of the closed-cone pines, ranging nearly the length of the state."
>
> "The Klamath Mountains are geologically old and support mixed evergreen forests of Douglas-fir, ponderosa pine, and sugar pine, with mountain hemlock, white fir, and chinquapin found at higher elevations. Serpentine soils are common in the Klamath Mountains. On the west side, Douglas-fir–hardwood forests grow at low elevations, giving way at higher elevation to white fir–Douglas-fir forests, white fir–California red fir forests, and finally to mountain hemlock–California red fir at the highest elevations. East and south of the highest ridges, the climate is drier and more continental. At low elevations, forests are dominated by ponderosa pine, which is replaced by white fir–pine forests at higher elevations, then red fir–white fir forests, and

[2] http://www.nwrc.usgs.gov/sandt/SNT.pdf accessed August 16, 2013.

finally mountain hemlock–red fir, with whitebark pine occurring at the highest elevations. The Klamath Mountains have a high floristic diversity, in part because they have acted as refugia supporting many endemics and relict species, including Pacific silver fir, subalpine fir, Alaska-cedar, Brewer spruce, Engelmann spruce, and foxtail pine. The complex vegetation patterns in the Klamath Mountains seem based primarily on differences in soils and secondarily on elevation and soil moisture (Sawyer and Thornburgh 1977)."

"The northern Coast Ranges occur immediately south of the Klamath Mountains. Coast Range forests do not include hemlock and have noble or red fir replacing grand fir, with rhododendron replacing chinquapin in the understory. Hardwoods increase in frequency on the drier slopes inland. The outer northern Coast Ranges, those farthest to the west, receive a great deal of rain (Hickman 1993). Riparian areas and north-facing slopes of the Coast Range fog belt support redwood forests…, which thrive where coastal fog is frequent. Redwood is a California endemic and is the tallest (112 meters) and fastest-growing tree in the world (Zinke 1977); one of these trees may live more than 2,000 years (Bakker 1972). Although redwoods were common in the Tertiary over much of North America, they are now restricted to the fog belt of maritime central and northern California. Proximity to the sea moderates temperatures, and fog helps prevent evapotranspiration (moisture loss from leaves). Fog drip contributes considerable moisture to the soil during the otherwise dry summer season (18–30 centimeters per year; Zinke 1977). The continuous moisture enables redwood forests to be home to a number of amphibians, including ensatinas, ocelot-spotted giant salamanders, tailed frogs, and seep salamanders, as well as the more common banana slugs (Bakker 1972)."

"Douglas-fir is often a codominant in redwood forests, becoming established after fires, and tanoak, California bay, madrone, and western hemlock are common understory trees where enough light penetrates the canopy (Zinke 1977). Redwood is a valuable timber tree because of its size and because of the wood's unique resistance to rot. More than 85% of the old-growth coast redwood forests has been logged, but much of the original distribution of about 810,000 hectares remains in second-growth redwood forests of varying ages. Second-growth redwood forests support most of the same native vascular plants as old-growth forests, but habitat for species that depend on old-growth forests—such as spotted owls, marbled murrelets, some arthropods, mollusks, and canopy lichens—has been greatly reduced (U.S. Fish and Wildlife Service 1995a). Logging of redwood continues, although most old-growth stands are now protected in state parks and in Redwood National Park."

"Drier slopes of the Coast Ranges support mixed-evergreen and mixed-hardwood forests, whereas montane forests of subalpine fir and pines are

found at higher elevations. Vegetation on the highest peaks is similar to that found at high elevations in the Sierra Nevada; peaks above 1,500 meters are treeless and experience heavy winter snows. Summers are hot and rainfall is low in the inner northern Coast Ranges, especially on eastern slopes in the rain shadow of the peaks. Serpentine soils are common, and dry eastern slopes support chaparral and pine–oak woodland. (Hickman 1993)."

2.1.1 Aesthetics

The North Coast Region is a predominantly rural region with numerous outstanding natural features and scenic vistas, including dramatic coastline, rolling hills, mountains, forests, rivers, wetlands, and estuaries. Hundreds of miles of highway cross through the North Coast Region. But, only a total of 52 miles have been designated officially as State Scenic Highway. This includes 12 miles of Highway 101 as it passes through Redwood State Park in Del Norte County; 12 miles of Highway 12 east of Santa Rosa in Sonoma County, and 28 miles of Highway 116 west of Santa Rosa in Sonoma County. Much of the rest of the highway system in the region is eligible as State Scenic Highway but has not been designated. These are listed in Table 2-1.

Table 2-1 Highways Eligible but not Designated as State Scenic Highways[3]

County	Highways
Del Norte	101 north of Crescent City, 169, 197, and 199
Glenn	None
Lake	20, 29, and 281
Mendocino	1, 20 and 101
Modoc	139 and 299
Siskiyou	96
Sonoma	1 and portions of 12
Trinity	2 and 299

As a general matter, light pollution resulting from outdoor lighting is restricted to the urban areas around Humboldt Bay from McKinleyville to Fortuna, Fort Bragg, Willits, Ukiah, and the greater Santa Rosa area from Windsor to Cotati. But of course, light pollution may be locally present wherever there are multiple outdoor lights.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact to aesthetics.

2.1.2 Agriculture

The predominant land uses in the North Coast Region are in the agricultural sector, including farming, ranching and timber production.

[3] http://www.dot.ca.gov/hq/LandArch/scenic_highways/, accessed 8/16/13.

The California State Department of Conservation (Conservation) produces maps of counties with Prime Farmland, Unique Farmland, and Farmland of Statewide Importance (agricultural lands of special significance). These are farmlands that based on their soil characteristics are especially well suited for agricultural production. Conservation has produced maps for Modoc, Siskiyou, Mendocino, and Sonoma counties. These maps indicate agricultural lands of special significance predominantly concentrated in: 1) the Tule Lake region in Modoc County; 2) the Scott Valley, Shasta Valley, and upper Klamath River Valley in Siskiyou County; 3) Round Valley, Potter Valley, Eden Valley, Anderson Valley and the upper Russian River Valley in Mendocino County; and 4) Alexander Valley, Dry Creek Valley, and the Laguna de Santa Rosa in Sonoma County.

Conservation also defines areas of grazing land, based on certain environmental characteristics. Mendocino County is identified as predominantly grazing land. Sonoma County is a patchwork of farm land and grazing land. Modoc and Siskiyou counties are predominantly National Forest, interspersed with farmland and grazing land.

The U.S. Forest Service (USFS) manages lands encompassing approximately 56% of the North Coast Region (6,889,419 acres) spread between two USFS Regions and six national forests:

1. USFS Region 5 (Pacific Southwest Region), manages all or a portion of the following National Forests: Modoc National Forest, Klamath National Forest, Shasta/Trinity National Forest, Six Rivers National Forest, and Mendocino National Forest. These Forests comprise about 6,793,819 acres of the North Coast Region.

2. USFS Region 6 (Pacific Northwest Region) manages a portion of the Rogue River-Siskiyou National Forest, accounting for approximately 95,600 acres of the North Coast Region.

Private timber land accounts for a substantial amount of the region's land area, including lands managed for industrial and non-industrial timber production. The California Board of Equalization reports a total harvest from counties of the North Coast Region of 575,900 million board feet or 575,900,000 board feet in 2012. This is more than 40% of the timber harvested in the state.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact to agriculture.

2.1.3 Air Quality

According to the California Air Resources Board (Air Board), the North Coast Region contains 3 separate, designated air basins. These are:

1. North Coast Air Basin encompassing Del Norte, Humboldt, Mendocino, Trinity, and substantial portions of Sonoma counties;
2. Northeast Plateau Basin encompassing Modoc, Lassen, and Siskiyou counties; and

3. Lake County Air Basin

The southern portion of Sonoma County is contained in the Bay Area Air Basin.

The pollutants of concern to air quality include: particulate matter (PM), ozone, nitrogen dioxide, sulfates, carbon monoxide, sulfur dioxide, visibility reducing particles, lead, hydrogen sulfide, and vinyl chloride. Statistics for ozone, particulate matter, carbon monoxide, nitrogen dioxide, and hydrogen sulfide are readily available for the 3 air basins within the North Coast Region, and Sonoma County, as shown in Table 2-2.

Ozone, an important ingredient of smog, is a highly reactive and unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through complex reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Key pollutants involved in ozone formation are hydrocarbon and nitrogen oxide gases. Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM 10." Fine particles are 2.5 microns or less in diameter (PM 2.5) and can contribute significantly to regional haze, reduction of visibility, and respiratory illness. Carbon monoxide (CO) is a colorless, odorless gas. It results from the incomplete combustion of carbon-containing fuels such as gasoline or wood, and is emitted by a wide variety of combustion sources. Sulfur dioxide (SO_2) is a gaseous compound of sulfur and oxygen. SO_2 is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.

Table 2-2 2012 Air Quality Statistics for the 3 Air Basins, and Sonoma County, contained within the North Coast Region[4]

	North Coast Air Basin	Sonoma County	Northeast Plateau Air Basin	Lake County Air Basin
Ozone, # of days > 1-hour CA standard	1	0	0	2
Ozone, # of days > 8-hour CA standard	0	0	1	3
PM2.5, # of days > 24-hour Nat'l standard	0	0	0	0
PM10, # days > 24-hour CA standard	0	*	0	0
Carbon Monoxide, # of days > CA standard	0	*	*	*
Nitrogen Dioxide, # of days > CA standard	0	0	*	*
Hydrogen Sulfide, # of days > CA standard	*	*	*	0

*Insufficient data to calculate

As indicated in Table 2-2, the air quality in the North Coast Region is exceptionally good. The California Air Pollution Control Officers Association reports that none of the counties within the North Coast Region had any days in 2012 in which overall air quality was "unhealthy" and all had" good" overall air quality for an average of 349 days of the year (CAPCOA 2013). With respect to ozone, the numbers of exceedences indicated in Table 2-2 are among the lowest of any of the air basins in the state.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact to air quality.

2.1.4 Biological Resources

The mission of the Regional Water Board is to develop and implement water quality standards and programs of implementation designed to restore and maintain the beneficial uses of water within the region. In the North Coast Region, some of the beneficial uses of water that often drive the water quality protection efforts of the agency are Cold Freshwater Habitat (COLD); Spawning, Reproduction, and Early Development (SPWN); Migration of Aquatic Organisms (MIGR); and Rare, Threatened or Endangered Species (RARE). The water quality programs designed to protect these beneficial uses, in turn, are most often driven by the habitat requirements of salmonids.

Salmonidae are a family of aquatic vertebrates that during the freshwater portion of their life cycle require cold, clear, well-oxygenated freshwater, free of excessive fine sediment or obstructions to migration. As such, they are often recognized as indicators of watershed health, where populations are stable. Historically, they were abundant in watersheds of the

[4] http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed on January 21, 2014.

North Coast Region. Today, populations of several Salmonidae species are listed by federal and state wildlife agencies as threatened or endangered by extinction. Species listed in some or all watersheds of the North Coast Region include: Chinook salmon, coho salmon, and steelhead trout. The proposed program is designed, in part, to protect the COLD, SPWN, MIGR, and RARE beneficial uses.

The Regional Water Board designs its water quality programs to protect other beneficial uses associated with the region's biological resources as well, including:

- Warm Freshwater Habitat (WARM)
- Estuarine Habitat (EST)
- Wildlife Habitat (WILD)
- Preservation of Areas of Special Biological Significance (ASBS)
- Wetland Habitat (WET)

The North Coast Region includes numerous threatened and endangered faunal and floral species (T&E species). The presence and disposition of T&E species must be evaluated at the project level to ensure their adequate site specific protection. The proposed program that is the subject of this CEQA analysis is intended to be implemented in a manner that restores and maintains the beneficial uses of the North Coast Region, including those beneficial uses identified above.

As elsewhere in the state, the quantity and quality of wetland habitat has been substantially reduced from historic levels. As such, the restoration and maintenance of the region's wetland and riparian resources is a high priority for the Regional Water Board. Riparian habitat is associated with virtually every waterbody in the North Coast Region. Substantial wetland habitat exists in the Laguna de Santa Rosa, Humboldt Bay, Bodega Bay, and associated with the estuaries of most of the rivers in the region.

Similarly, the water quality protection efforts of the Regional Water Board are intended to support and complement the environmental protection efforts represented in local policies and ordinances, Habitat Conservation Plans, Natural Community Conservation Plans, and other approved local, regional, or state habitat conservation plans.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact to biological resources.

2.1.5 Cultural Resources

The Regional Water Board has adopted a Native American Culture (CUL) beneficial use designed to support the cultural and/or traditional practices of indigenous people such as subsistence fishing and shellfish gathering, basket weaving and jewelry material collection, navigation to traditional ceremonial locations, and ceremonial uses. The CUL beneficial use has been designated in the Smith River, Klamath River, Trinity River, Redwood Creek, Mad River, Jacoby Creek, Freshwater Creek, Salmon Creek, Van Duzen River, and Oil Creek watersheds, as well as Trinidad Hydrologic Unit, Humboldt Bay, and Ferndale Hydrologic

Subarea. However, CUL is an existing beneficial use in other locations throughout the region, and which will be designated once the data are collected. The proposed program that is the subject of this CEQA analysis is intended to be implemented in a manner that restores and maintains the beneficial uses of the North Coast Region, including the CUL beneficial use.

Because the North Coast Region has a rich human history going back perhaps 10,000 years, lands throughout the region have the potential to harbor buried ancient cultural resources. Similarly, there are numerous sites of historic interest scattered throughout the region, representing the region's mining, shipping, logging, and agricultural history, among others. The presence and disposition of cultural resources must be evaluated at the project level to ensure their site-specific protection.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact to cultural resources.

2.1.6 Geology and Soils

The California Geological Survey divides the state into 11 distinct geomorphic provinces. A geomorphic province is a naturally defined geologic region that displays a distinct landscape or landform. The Klamath River sub-basin includes the Modoc Plateau, Cascade Range, and Klamath Mountain provinces. The North Coastal sub-basin includes the Coastal Range province.

Modoc Plateau Geomorphic Province
The Modoc Plateau is a volcanic table land (elevation 4,000-6,000 feet above sea level) consisting of a thick accumulation of lava flows and tuff beds along with many small volcanic cones. Occasional lakes, marshes, and sluggishly flowing streams meander across the plateau. The plateau is cut by many north-south faults. The province is bound indefinitely by the Cascade Range on the west and the Basin and Range on the east and south.

Cascade Range Geomorphic Province
The Cascade Range, a chain of volcanic cones, extends through Washington and Oregon into California. It is dominated Mt. Shasta, a glacier-mantled volcanic cone, rising 14,162 feet above sea level.

Klamath Mountains Geomorphic Province
The Klamath Mountain Geomorphic Province has rugged topography with prominent peaks and ridges reaching 6,000-8,000 feet above sea level. In the western Klamath, an irregular drainage pattern is incised into an uplifted plateau called the Klamath peneplain. The uplift has left successive benches with gold-bearing gravels on the sides of the canyons. The Klamath River follows a circuitous course from the Cascade Range through the Klamath Mountains. The province is considered to be a northern extension of the Sierra Nevada (CDC 2002). The Klamath Mountain Geomorphic Province consists of four mountain belts: the eastern Klamath Mountain belt, central metamorphic belt, western Paleozoic and

Triassic belt, and western Jurassic belt. Low-angle thrust faults occur between the belts and allow the eastern blocks to be pushed westward and upward. The central metamorphic belt consists of Paleozoic hornblende, mica schists, and ultramafic rocks. The western Paleozoic and Triassic belt, and the western Jurassic belt consist of slightly metamorphosed sedimentary and volcanic rocks. This is an uplifted and dissected peneplain on strong rocks; there are extensive monadnock ranges. Elevation ranges from 1,500 to 8,000 ft (456 to 2,432 m). Soils include Alfisols, Entisols, Inceptisols, and Ultisols, in combination with mesic and frigid soil temperature regimes and xeric and udic soil moisture regimes.

Coast Ranges
The Coast Ranges are northwest-trending mountain ranges (2,000 to 4,000, and occasionally 6,000 feet elevation above sea level), and valley. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valley in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 6000 miles long, extending from Point Arena to the Gulf of California (CDC 2002). This area has parallel ranges, and folded, faulted, and metamorphosed strata; there are rounded crests of subequal height. Elevations range from 1,000 to 7,500 ft (304 to 2,280 m). Soils include Alfisols, Entisols, Inceptisols, Mollisols and Ultisols in combination with mesic and thermic soil temperature regimes and xeric soil moisture regime.

Tectonics
Of prime significance to the geology and soils of the North Coast Region is the collision and subduction of the Juan de Fuca tectonic plate under the North American plate and the transform (strike-slip) movement between the Pacific and North American plates along the San Andreas fault, including activity at the Triple Junction where the North American, Gorda, and Pacific plates meet. The tectonic activity of the North Coast Region generally results in steep, unstable slopes and a mixture of consolidated and unconsolidated, marine and continental-derived geology. As a result, erosional potential in the North Coast Region can generally be described as high.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact from erosion and sedimentation resulting from land disturbance.

2.1.7 Greenhouse Gas Emissions (GHGs)

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs).[5] The major greenhouse gases of concern include the following:

- *Carbon dioxide (CO_2)*-- Carbon dioxide enters the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- *Methane (CH_4)* -- Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- *Nitrous oxide (N_2O)* -- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- *Fluorinated gases* -- Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

A statewide GHG inventory conducted by the California Air Board indicates that of the total GHG emissions in California in 2004, the categories of GHG sources rank as follows by percent contribution: transportation (38%); electricity generation (25%); industrial processes, including landfills and wastewater treatment (20%); commercial and residential fuel uses (9%); agriculture and forestry (5%); and unspecified emissions (3%). The estimate of agriculture and forestry contributions to GHG emissions includes consideration of the carbon sequestration services provided by trees and rangeland.[6]

The net GHG emissions in the state increased from 1990 to 2004 by about 12%. The source categories contributing most significantly to the increase in emissions came from electricity generation (19% increase above 1990 contributions from this source category), transportation (21% increase), agriculture and forestry (39% increase) and an increase in unspecified emission sources (1161% increase). These increases were balanced by decreases in other source categories, including decreased emissions from commercial and residential fuel uses (13% decrease) and industrial fuel uses (7% decrease). The Global Warming Solutions Act of 2006 (AB 32) calls for the reduction by 2020 of GHG emissions to California's 1990 levels.

[5] http://www.epa.gov/climatechange/ghgemissions/gases.html accessed August 26, 2013.
[6] http://www.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_sector_90-04_sum_2007-11-19.pdf accessed August 26, 2013.

With respect to the analysis of potential environmental impacts associated with this proposed program, the source categories of most interest include: road transportation, electricity generation, landfills, wastewater treatment, residential and commercial fuel uses, and agriculture and forestry. A project implemented under this proposed program could result in an increase in GHGs over baseline conditions if it results in an increase in: fuel use associated with transportation, electricity use, land disposal or composting of waste (including wood and agricultural waste), wastewater influent volumes or concentrations, residential or commercial density. A project could result in a decrease in GHGs over baseline conditions if it results in an increase in woody biomass or a decrease in any of the categories listed above.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact resulting from GHG emissions.

2.1.8 Hazards and Hazardous Materials

A CEQA analysis includes evaluation of the project impacts with respect to the use of hazardous substances, proximity to hazardous waste facilities, proximity to airports, likelihood of interfering with emergency response, and potential to expose people to significant wildfire risk.

Hazardous Materials

According to the California Department of Toxic Substances Control's (DTSC) website[7] there are no commercial offsite hazardous waste removal facilities in the North Coast Region, except for a used oil and antifreeze facility in the City of Fortuna. Also reported on its website, there are 12 sites in the North Coast Region included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. They include: 1 in Del Norte, 2 in Humboldt, 1 in Lake, 3 in Mendocino, 1 in Modoc, 2 in Sonoma, 2 in Siskiyou and none in Trinity counties. Further, staff of the Regional Water Board oversees hundreds of groundwater contamination site cleanups in the North Coast Region, including leaking underground storage tank and spill sites. These sites are spread throughout the region and information about them can be found on the State Water Board's website.[8]

[7] http://www.envirostor.dtsc.ca.gov/public/ accessed August 16, 2013.
[8] http://geotracker.waterboards.ca.gov/ accessed August 16, 2013.

Risk of Wildfire
The North Coast Region is predominantly rural and largely vegetated with grassland, woodland, and forest. The California Department of Forestry and Fire Protection (CalFire) has identified hundreds of North Coast communities at risk from wildfires on either federal or non-federal lands. Further, CalFire has identified at least 5 communities as existing in a Very High Fire Hazard Severity Zone, including: Cloverdale, Santa Rosa, Ukiah, Willits, and Yreka. As such, the existing risk to North Coast residents from wildfire can be considered high.

Hazardous Substances and Emergency Response Plans
The baseline condition as it relates to the use of hazardous substance and the availability of a local emergency response plan can only be determined at the project level. A project implemented in compliance with this proposed program must conduct a project level analysis of these issues.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact resulting from hazards and hazardous substances.

2.1.9 Hydrology and Water Quality

Water Quality
The surface water quality issues of most concern in the North Coast Region are excess sediment, elevated water temperatures, and excess nutrients. These water quality conditions are the result of point and non-point sources of pollution and other controllable factors (e.g., landscape alteration, road building, etc.) and are exacerbated by hydrologic modification, water withdrawal, and the loss of competent riparian zones and floodplains to development, agriculture, and logging. Many north coast aquatic ecosystems are impacted by these pollution sources and controllable factors, resulting in a loss of sustainable water supply, loss of aquatic habitat and risk to threatened and endangered aquatic species, increase in winter flood potential, and increase in risk of summer nuisance algal blooms (including microcystis and other cyanobacteria).

There are more localized water quality issues, as well. For example, surface water monitoring indicates a problem with pathogens in Bodega Bay Hydrologic Area, Hare Creek Beach and Pudding Creek Beach on the Mendocino Coast, several coastal beaches in the Trinidad Hydrologic Unit, and riverfront beaches on the Russian River and its tributaries, as well as the Laguna de Santa Rosa and its tributaries. In addition, several of the region's waterbodies are impaired by mercury, including: Lake Pillsbury, the Laguna de Santa Rosa, Lake Sonoma, Trinity Lake, and the East Fork Trinity River. Exotic species are listed as a water quality problem in Bodega Bay and dioxin and PCBs are listed as impairing Humboldt Bay.

In 2009, the USGS, in conjunction with the State Water Resources Control Board, collected untreated groundwater data from 58 wells selected from the California Department of Public Health (now State Water Board Division of Drinking Water) database within 34

groundwater basins located in the North Coast Region. Wells were randomly selected from Lake, Mendocino, Glenn, Humboldt, and Del Norte Counties. The results of the study are published in Methany et al. (2011). All detected concentrations of organic constituents, nutrients, major and minor ions, and radioactive constituents were less than health-based benchmarks for the 30 wells sampled in the Northern Coast Ranges. There were a few detections of arsenic, boron, and barium in the 28 wells of the interior basins that exceeded drinking water standard maximum contaminant levels (MCLs) or notification levels; but, these are likely related to the area's geology. The results of this study indicate that community drinking water systems drawing from primary aquifer systems in the North Coast Region generally provide safe drinking water, with the exceptions noted.

Groundwater quality problems in the North Coast Region include contamination from seawater intrusion and nitrates in shallow coastal groundwater aquifers; high total dissolved solids and alkalinity in groundwater associated with the lake sediments of the Modoc Plateau basins; and iron, boron, and manganese in the inland groundwater basins of Mendocino, Sonoma, and Siskiyou counties. Past and potential septic tank failures in western Sonoma County at Monte Rio and Camp Meeker, along the Trinity below Lewiston Dam, in the vicinity of Fort Bragg along the Mendocino Coast, and the shore of Arcata in Humboldt Bay, and various other areas throughout the region, are a concern due to potential impacts to groundwater wells and recreational water quality. Potential contributions of nutrients and pesticides to shallow groundwater are resulting from the continued conversion of land to vineyards in Sonoma and Mendocino counties, widespread farming activities in the Upper Klamath River basin and the Smith River plain and other agricultural activities at locations throughout the region. Aging wastewater treatment ponds and leaking septic tanks play a part in shallow groundwater contamination in the region, as well. Groundwater is likely to become an increasingly important source of domestic, municipal, and agricultural water supply, as a result of climate change and predicted effects on surface water discharge volumes and timing. However, a significant amount of shallow groundwater has been contaminated by a long history of activities and operations, primarily: wood treatment facilities, unlined landfills, leaking underground storage tanks, dry cleaning facilities, inadequate wastewater treatment ponds, and insufficient septic systems. In many basins, shallow groundwater is neither used nor useable. But, because the North Coast Region is predominantly rural, many people rely on shallow (sometimes hand-dug) wells for their drinking water.

In the 2014 California Water Plan, the Department of Water Resources (DWR) presents information gathered on groundwater use in the North Coast Region[9]. As noted there is limited large-scale groundwater development in the North Coast Region due to the small number of significant coastal aquifers. Most of the groundwater development that has

[9] http://www.waterplan.water.ca.gov/

occurred comes from shallow wells installed adjacent to rivers. There are, however, significant groundwater basins underlying the Klamath River Valley (including Tule Lake, and Lower Klamath Sub-basins), Santa Rosa Valley, Shasta Valley, Smith River Plain, Ukiah Valley, Eel River Valley, Scott River Valley and Butte Valley. Despite the limits on large-scale infrastructure, groundwater is used widely throughout the region for individual domestic, agricultural, and industrial water supply. Many rural areas rely exclusively on private wells for residential water. According to a review of driller well logs from 1977 to 2010 approximately 35,000 wells were installed in the North Coast Region. Of those approximately 70% are for domestic use, 17% for environmental monitoring, 5% for agricultural irrigation, 2% for public water supply and less that 1% for industrial supply. While domestic wells are more numerous than agricultural wells, approximately 83% of the groundwater used between 2002 and 2010 was for agricultural purposes while 15% was for urban/domestic use. (DWR 2013)

Hydrology
Because of the low infiltration capacity and permeability of the Franciscan and volcanic rocks common in the North Coast Region, groundwater origin baseflows in streams are sometimes poorly maintained. Along the mountain drainages, baseflow that does occur is maintained by groundwater discharge emerging from fractures through springs and seeps. Some streams may be composed of discontinuous wet reaches with pools sustained over summer by groundwater discharge. Some higher elevation streams may run dry from summer to late fall. As a consequence, flows between these ephemeral streams and the underlying aquifer may periodically cease.

In the valleys, groundwater occurs in the alluvial deposits. Many rural residents throughout the region intercept groundwater in fractures or localized alluvium. In these settings, groundwater may be impacted by periodic or seasonal depletion. There, baseflow is maintained by groundwater discharge along reaches where the water table is higher than the adjacent stream. In the larger valley drainages, such as the Russian River, groundwater discharge is large enough to sustain perennial flow (R2 Resource Consultants & Stetson Engineers, 2007). This is similarly the case in the Klamath River basin. Though, studies in the Scott River Valley and the Santa Rosa Plain indicate that groundwater pumping for irrigation has impacted stream flow in the Scott River and Laguna de Santa Rosa watersheds, respectively.

With respect to groundwater depletion, the potential is a noted risk within groundwater basins in the Santa Rosa Plain, the lower Mad River area, the town of Mendocino, Scott Valley, and Tule Lake and has resulted in the investment of numerous stakeholders developing voluntary groundwater management plans.

The *Sustainable Groundwater Management Act* (SGMA) was signed by Governor Edmund G. Brown Jr. on September 16, 2014, and includes the provisions of Senate Bill (SB) 1168, Assembly Bill (AB) 1739, and SB 1319. A central feature of the SGMA is the recognition that groundwater management in California is best accomplished locally. The SGMA builds upon the existing groundwater management provisions established by AB 3030 (1992), SB

1938 (2002), and AB 359 (2011), as well as SBX7 6 (2009) which established the California Statewide Groundwater Elevation Monitoring (CASGEM) Program.

The SGMA requires the formation of locally-controlled Groundwater Sustainability Agencies (GSAs) which must develop Groundwater Sustainability Plans (GSPs) in groundwater basins or subbasins that DWR designates as medium or high priority. The legislative intent of the SGMA is to achieve all of the following:

- To provide for the sustainable management of groundwater basins.
- To enhance local management of groundwater consistent with 1) rights to use or store groundwater and 2) Section 2 of Article X of the California Constitution.
- To establish minimum standards for sustainable groundwater management.
- To provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater.
- To avoid and minimize subsidence.
- To improve data collection and understanding about groundwater.
- To increase groundwater storage and remove impediments to recharge.
- To manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention.

The SGMA defines sustainable groundwater management as "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." Undesirable results are defined as any of the following effects:

- Chronic lowering of groundwater levels (not including overdraft during a drought if a basin is otherwise managed).
- Significant and unreasonable reduction of groundwater storage.
- Significant and unreasonable seawater intrusion.
- Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.
- Significant and unreasonable land subsidence that substantially interferes with surface land uses.
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

There are currently eight medium priority basins within the North Coast including:

1. Smith River Plain
2. Eel River Valley
3. Scott River Valley
4. Shasta River Valley
5. Tule Lake
6. Ukiah Valley
7. Santa Rosa Plain
8. Butte Valley

Surface flows in the North Coast Region are impacted by numerous water diversions, both permitted and unpermitted, legal and illegal. The State Water Board has adopted the North Coast Instream Flow Policy to better ensure that future water rights permits contain the provisions necessary to protect the stream flows necessary to support salmonids and salmonid habitat. Further, recent collaboration between the staff of the North Coast Region and the Division of Water Rights has resulted in contemporary water rights permits containing provisions specific to the protection of water quality conditions in the North Coast Region. For example, erosion control plans and riparian protection plans are sometimes required in new water rights permits.

On the other end of the spectrum, the North Coast Region contains hundreds of miles of rural private and public roads which sometimes serve to extend the drainage network of the region's watersheds with inadequate, poorly designed, or failing road drainage features. The result, in some watersheds, has been an increase in peak flows or change in peak flow timing, accompanied by an increased risk of erosion, sedimentation, and flooding.

Also with respect to flooding, many of the watersheds of the North Coast Region are still moving quantities of stored sediment first deposited during catastrophic flooding events of 1955 and 1964. Flooding events of 1982, 1995, and 1997 also have had dramatic impact on North Coast rivers. The California Emergency Management Agency has mapped a tsunami inundation risk for all of Del Norte County, Humboldt County from its border with Del Norte to Ferndale, Mendocino County from Brunel Point to Gualala, and Sonoma County from Russian Gulch to Bodega Head.[10]

Recycled Water

"Recycled water" means water that, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource[11]. California experiences frequent drought conditions. On April 25, 2014, the Governor proclaimed a continued State of Emergency due to severe drought conditions and directed the State Water Board to adopt statewide general waste discharge requirements to facilitate the use of treated wastewater that meets standards set by the former California Department of Public Health (CDPH) Division of Drinking Water, now the State Water Board Division of Drinking Water (DDW) in order to reduce demand on potable water supplies. Recent emergency actions follow a similar Declaration of Statewide Drought in effect from 2008 through 2011 (Executive Order S-06-08) and Drought Declaration State of Emergency in effect from 2009 through 2011 (Executive Order S-11-09). Drought conditions in California also persisted from 1987 through 1992. Paleoclimatologists have reconstructed medieval climate episodes from tree ring studies, sediment deposition, and other sources. These studies show that the most severe droughts during the past 1,000 years have lasted from 20 to more than 150 years.

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[10] http://www.consrv.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Pages/Statewide_Maps.aspx accessed August 16, 2013.
[11] CWC § 13050(n).)

Recycled water use can help to reduce local water scarcity. It is not the only option for bringing supply and demand into a better balance; but, it is a viable cost effective solution that is appropriate in many cases. The feasibility of recycled water use depends on local circumstances, which affect the balance of costs and benefits. In drought conditions, recycled water can be particularly valuable, given the scarcity of alternative supplies. In normal precipitation years recycled water use may reduce groundwater extraction, which could also be augmented with storm water capture and infiltration and groundwater recharge. For additional discussion on groundwater management see Section 2.2 existing regulatory framework.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impact resulting from controllable factors with the potential to impact hydrology or water quality.

2.1.10 Land Use and Planning

As above, it is not the intention of this proposed program to interfere with or supersede any land use plan, policy or regulation of another agency. A project-level analysis is necessary to ensure that the project is designed and/or mitigated in such a manner as to comply with the requirements of other agencies.

2.1.11 Mineral Resources

Like elsewhere in the state, the North Coast Region was substantially impacted by the California gold rush of 1949, particularly in the Klamath Geomorphic Province where hundreds of gold claims were exercised and where suction dredging is still of interest. Abandoned mines in the Klamath Basin are the focus of cleanup. Further, sand, gravel and other aggregate is a substantial commodity of the North Coast Region, impacting numerous watersheds in the region. A project-level analysis is necessary to ensure that the project is designed and/or mitigated in such a manner as to consider it within the context of cumulative water quality impacts which may arise in conjunction with historical and contemporary mineral extraction.

2.1.12 Noise

The North Coast Region is substantially rural, with a limited number of larger communities, the largest being Santa Rosa and its surrounding communities in Sonoma County. As a general matter, noise pollution is limited to localized areas. As above, any project implemented as a result of this proposed program must be evaluated on a site-specific basis, appropriately avoiding, minimizing, and mitigating potential impacts.

2.1.13 Population, Housing, and Public Services

The North Coast Region includes all residents of Del Norte, Humboldt, Trinity, and Mendocino counties, the majority of Modoc, Siskiyou, and Sonoma counties, and a small percentage of the populations of Glenn, Lake and Marin counties. The population of the

entire North Coast Region was about 670,700 in year 2010[12], which is less than 2 percent of California's total population. More than half of this region's population lives in the southern part, primarily in Santa Rosa and the surrounding communities of Cotati, Healdsburg, Rohnert Park, Sebastopol and Windsor in the Russian River Watershed with a population of 261,485 people in year 2010[13], which is heavily influenced by the overall urban expansion of the adjacent San Francisco Bay region. Other smaller communities in the northern portions of this region include Eureka, 27,191; Ukiah, 16,075; Arcata, 17,231; Crescent City, 7,643; and Yreka, 7,765.[14]

When compared with the 2000 regional population of 636,000, the 670,300 in 2010 represents a growth rate of 5.4 percent over the 10 years, which is a little over half the statewide growth rate of about 9.7 percent over the same period. Projections today indicate that the regional population is expected to grow to about 809,400 by year 2050, which represents approximately 21 percent increase from year 2010 totals. More than half of this projected growth is anticipated to occur in the Santa Rosa region, as urban populations from the San Francisco Bay area continue to expand north. Population increases in the rural communities in the northern portion of this region are projected to grow more slowly.

The North Coast Region has experienced steady population growth over the past two decades and is projected to continue positive growth through the year 2050[15]. Due to the rural nature of much of the region and the fact that there is a lower associated cost of living, many communities within the region are seeing an influx of retirees from larger, more urbanized settings. This has placed pressure on existing community services. Additionally, as population densities encroach in the more urban settings, some of the more rural communities are becoming bedroom communities. There is also a rise in migrant workers within the region. Modoc County has a county-operated migrant camp. The trend for both Modoc and Siskiyou counties is that many of the migrant workers are becoming permanent residents, while younger non-migrant residents continue to leave the area. Despite the overall growth rates of the region, population growth rates are not as great as those of the rest of the Sstate, reflecting the rural character of the region. In fact, some of the more remote counties of the region - Modoc and Siskiyou - are projected to lose overall population in the coming decades.

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impacts.

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[12] http://www.dof.ca.gov/research/demographic/state_census_data_center/census_2010/ accessed August 16, 2013.
[13] Ibid.
[14] Ibid
[15] Ibid.

2.1.14 Recreation

The Regional Water Board implements water quality protection programs designed to result in water quality suitable for full contact water recreation such as swimming and surfing (REC-1), as well as non-contact water recreation (REC-2). Other beneficial uses potentially relevant to the topic of recreation include Navigation (NAV), Commercial and Sport Fishing (COMM), and Shell Fish Harvesting (SHELL). As a predominantly rural region, the North Coast Region offers a multitude of recreational opportunities in addition to water-related activities, including camping, hiking, backpacking, horseback riding, bike riding, bird watching, and much more. Protection of REC-1 and REC-2 uses must be incorporated into any specific project implemented under this proposed program.

2.1.15 Transportation/Traffic, Utilities and Service Systems

Transportation and Traffic

The North Coast Region is serviced by Districts 1, 2, and 4 of the California Department of Transportation (Caltrans). Highway 101 is the major highway corridor from north to south and Highways 128, 20, 162, 36, 299, and 199 are the major highway corridors from west to east. These highway corridors are 2 and 4 lane highways, vulnerable to traffic delays when road work is undertaken. Caltrans projects currently affecting transportation and traffic include: the Willits Bypass in District 1; on-going maintenance on Hwy 299 and the Anderson Grade Project near Yreka in District 2; and road widening on Hwy 101 through Sonoma County in District 4. Activities associated with the development of the Sonoma-Marin Area Rail Transit (SMART) from Cloverdale in Sonoma County to the Larkspur Landing ferry terminal in Marin County also have the potential to cause traffic congestion as a baseline condition.

Airports

There are numerous airports throughout the North Coast Region, including 3 passenger airports: the Jack McNamara Field Airport in Del Norte County, the Arcata-Eureka Airport in Humboldt County, and the Charles Schultz Airport in Sonoma County. In addition, there are 22 public use airports found in Cloverdale, Covelo, Eureka (3), Fortuna, Garberville, Gasquet, Gualala, Hayfork, Healdsburg, Hoopa, Hyampom, Klamath Glen, Little River, Sonoma, Trinity Center, Tulelake, Ukiah, Weaverville, and Willits.

Wastewater Treatment Facilities, Water Treatment Facilities, Stormwater Facilities, Landfills

The point source discharge of waste to waters of the region is prohibited except in the Mad, Eel, and Russian rivers during the wet weather season. All other wastewater treatment is provided by percolation ponds, evaporation ponds, or other land disposal, including septic systems. Discharge to the Mad, Eel and Russian rivers is further limited to 1% of river flow. Many of the wastewater treatment systems, including septic systems, in the North Coast Region are very old and require upgrade.

Water is abundant in many parts of the North Coast Region. According to Methany et al. (2011), a sampling of community water delivery systems in the North Coast Region provides good drinking water to their customers. Many residents of the North Coast Region, however, rely on private domestic wells, surface water intakes, or small community

systems; except in localized areas, water availability is generally good and is sometimes consumed untreated. The Regional Water Board implements water quality protection programs designed to result in water resources that are suitable as drinking water. Protection of drinking water, as defined by the Municipal and Domestic Supply (MUN) beneficial use, is fundamental to this program.

The Regional Water Board implements several National Pollutant Discharge Elimination System (NPDES) permits for the control of storm water from industrial facilities, construction sites, and municipalities. These primarily rely on best management practices (BMPs) to avoid, minimize and mitigate the impacts of storm water discharge. Large and small municipal sewer system operators must comply with permits that regulate storm water entering their systems under either a Phase I or a Phase II permit. . Phase I permit regulates storm water discharges from medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Phase II permit regulates smaller (serving less than 100,000 people) municipalities, including non-traditional small operations, such as military bases, public campuses, and prison and hospital complexes. The largest, single municipal discharger in California is the California Department of Transportation (Caltrans) and its network of highways and road facilities operate under an individual municipal separate storm sewer system (MS4) permit. The City of Santa Rosa, Sonoma County, and Sonoma County Water Agency implement an extensive storm water control program under the only Phase I MS4 permit issued by the Regional Water Board. Phase II dischargers within the region include:

<u>Traditional Phase IIs</u>

- Arcata
- Eureka
- Fortuna
- McKinleyville
- Trinidad
- Crescent City
- Bayview CDP
- Cutten CDP
- Humboldt Hill CDP
- Myrtletown CDP
- Pine Hills CDP
- Ridgewood Heights
- Rosewood USSA
- Cloverdale CDP
- Forestville CDP
- Guerneville CDP
- Cotati
- Healdsburg
- Rohnert Park
- Windsor
- Sebastopol
- Monte Rio
- Occidental
- Yreka
- Fort Bragg
- Mendocino County
- Ukiah

<u>Non-Traditional Phase IIs</u>

- Arcata
- Eureka
- Fortuna
- McKinleyville
- Trinidad
- Rosewood USSA
- Cloverdale CDP
- Forestville CDP
- Guerneville CDP
- Cotati
- Mendocino County
- Ukiah

- Crescent City
- Bayview CDP
- Cutten CDP
- Humboldt Hill CDP
- Myrtletown CDP
- Pine Hills CDP
- Ridgewood Heights
- Healdsburg
- Rohnert Park
- Windsor
- Sebastopol
- Monte Rio
- Occidental
- Yreka
- Fort Bragg

All the landfills in the North Coast Region have been closed, except the Central Disposal site off Meecham Road in Sonoma County. Transfer Stations are operated throughout the rest of the region with much of the waste material transferred outside the Region for disposal. Additional description of the land disposal program is provided in Section 2.2.1

Any project implemented under this proposed program should be designed to avoid, minimize and mitigate any potential impacts resulting from transportation, wastewater treatment and discharge, stormwater capture and discharge, and landfill design and management.

2.2 Existing Regulatory Framework

The Regional Water Board administers both state and federal regulations for water quality control. Discharges to surface waters are regulated via orders pursuant to section 402 of the federal Clean Water Act (CWA) and regulations adopted by the USEPA, as well as chapter 5.5, division 7 of the California Water Code (commencing with section 13370). Such an order serves as an NPDES permit for point source discharges to surface waters. Discharges to waters of the state (groundwaters and surface waters) are regulated by orders which serve as Waste Discharge Requirements (WDRs) or waivers thereof pursuant the California Water Code (commencing with section 13260).

State Water Board describes the planning authority under Porter-Cologne to extend to any activity or factor that may affect water quality, including waste discharges, saline intrusion, reduction of waste assimilative capacity caused by reduction in water quantity, hydrogeologic modifications, watershed management projects, and land use. It further makes clear that all dischargers are subject to regulation under the Porter-Cologne Act including both point and nonpoint source dischargers (SWRCB 2004).

Water quality objectives in the Basin Plan are developed to protect all applicable beneficial uses, including the MUN beneficial use unless otherwise stated. The Basin Plan includes a number of water quality objectives that address drinking water, human health and aquatic ecosystem protection. There are narrative objectives for chemical constituents, taste and odor, sediment, suspended material, temperature, and toxicity, and numeric objectives for chemical constituents and salinity, among others. The Basin Plan has incorporated the maximum contaminant levels (MCLs) specified in Title 22 of the California Code of

Regulations in 1975 for waters designated MUN. While the numeric values specified in Title 22 have since been updated, the values in the Basin Plan have not. Additionally, the Regional Water Board deals with a large number of potential constituents of concern (i.e., contaminants) that do not have drinking water standards (i.e., MCLs). The lack of an MCL does not mean that the chemical does not pose a threat to human health or aquatic life. Therefore, based on the statewide policies and authorities given to the Regional Water Board to protect beneficial uses, more relevant values (toxicity information) have been applied in regulatory actions and orders to protect those beneficial uses.

There are a number of existing State Water Board policies that, in addition to Basin Plan requirements, are implemented for the protection of human health and aquatic life. The following contains a list of the policies and brief summaries.

State Water Board Resolution No. 68-16, Policy with Respect to Maintaining High Quality of Water in California
Commonly known as the State's Antidegradation Policy, the goal of this policy is to maintain high quality waters. Whenever the existing water quality is better than the established water quality objectives, such existing quality shall be maintained. Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State; does not unreasonably affect present and anticipated beneficial uses; and does not result in water quality less than that prescribed in water quality control plans or policies. The application of the Antidegradation Policy protects existing and future beneficial uses of water and requires the best practicable treatment technologies. Resolution No. 68-16 also incorporates the federal antidegradation policy which applies to all federal surface waters. The Antidegradation Policy is generally applied at the time an individual action is contemplated within the context of a WDR or other action of the Regional Water Board.

State Water Board Resolution No. 88-63, Sources of Drinking Water Policy
Commonly known as the Sources of Drinking Water Policy, establishes the state policy that all waters are considered suitable or potentially suitable to support the MUN beneficial use, with certain exceptions. The Basin Plan implements State Water Board Resolution 88-63 ("Sources of Drinking Water Policy") by assigning MUN to all surface water bodies listed in Table 2-1 of the Basin Plan, except ocean waters, bays, and saline wetlands. Pursuant to Resolution No. 88-63, the following exceptions to the MUN designation are allowed for surface waters and groundwaters:

1) With total dissolved solids exceeding 3,000 mg/L,
2) With contamination that cannot reasonably be treated for domestic use,
3) Where there is insufficient water supply for a single well to provide an average, sustained yield of 200 gallons per day,
4) In systems designed for wastewater collection or conveying or holding agricultural drainage, or
5) Regulated as a geothermal energy producing source.

Resolution 88-63 addresses only designation of water as drinking water sources; it does not establish objectives for constituents that are protective of the designated MUN use.

Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

Commonly known as the State Implementation Policy (SIP), the State Water Board adopted this policy as Resolution No. 2000-015 in March 2000. The National Toxics Rule (NTR) and California Toxics Rule (CTR) include criteria to protect human health, as promulgated by USEPA. The SIP is implemented primarily through the National Pollutant Discharge Elimination System (NPDES) permitting program. It establishes a standardized approach for permitting wastewater discharges of toxic pollutants. This Policy establishes:

- Implementation provisions for priority pollutant criteria promulgated by the USEPA through the NTR (40 CFR 131.36) (promulgated on 22 December 1992 and amended on 4 May 1995) and through the CTR (40 CFR 131.38) (promulgated on 18 May 2000 and amended on 13 February 2001), and for priority pollutant objectives established by Regional Water Boards in their basin plans;
- Monitoring requirements for 2,3,7,8-TCDD equivalents; and
- Chronic toxicity control provisions.

Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304, State Water Board Resolution No. 92-49

This policy contains procedures for the Regional Water Board to follow for oversight of cleanup projects to ensure cleanup and abatement activities protect the high quality of surface water and groundwater. This policy requires the cleanup and abatement of constituents of concern to levels that would not pose a risk to water quality, human health or the environment. Cleanup and abatement activities are to be performed in a manner that either achieves background water quality, or the best water quality which is reasonable taking all demands being made and to be made on those waters and the total values involved. Generally, cleanup goals are established at natural background levels for constituents with natural sources and zero (or non-detect) for all other constituents. Cleanup criteria are derived from human health-based criteria, including toxicity criteria, when zero, non-detect, or natural background is not reasonably achievable. Or, they are derived from aquatic life criteria, where groundwater is connected to surface water and aquatic organisms are the most sensitive receptors. This policy establishes the procedures for identifying containment zones and determining the economic feasibility of assessment and remedial actions. Additionally, the policy requires mitigation actions to reduce significant adverse impacts to water quality, human health and the environment, including any nuisance conditions[16] such as impacts to taste and odor that affect a whole community or neighborhood. The basis for Regional Water Board decisions regarding investigation, and cleanup and abatement includes:

1) Site–specific characteristics;

[16] Nuisance as defined in Porter-Cologne §13050

2) Applicable state and federal statutes and regulations;
3) Applicable water quality control plans adopted by the State Water Board and Regional Water Boards, including beneficial uses, water quality objectives, and implementation plans;
4) State Water Board and Regional Water Board policies, including State Water Board Resolutions No. 68-16 (Antidegradation) and No. 88-63 (Sources of Drinking Water). This reiterates the requirement for cleanup and abatement actions to achieve background conditions; and
5) Relevant standards, criteria, and advisories adopted by other state and federal agencies.

The policy explicitly states, "No provision of this Policy shall be interpreted to allow exposure levels of constituents of concern that could have a significant adverse effect on human health or the environment."

Policy for Water Quality Control for Recycled Water, State Water Board Resolution 2009-0011, (Recycled Water Policy, Revised January 22, 2013, effective April 25, 2013.) The Recycled Water Policy promotes the use of recycled water to achieve sustainable local water supplies and reduce greenhouse gas emissions. Water recycling is an essential part of an overall program to manage local and regional water resources. Many local governing bodies have adopted resolutions establishing their intent to proceed with planning, permitting, and implementation of recycled water projects. These projects will provide water supply and municipal wastewater disposal benefits for communities, and will provide water supply benefits to agriculture.

Several municipalities and smaller industrial and commercial dischargers in the North Coast have implemented recycled water project including but not limited to:

- City of Santa Rosa (including areas of Rohnert Park and Cotati);
- Town of Windsor;
- Graton Community Service District;
- City of Healdsburg;
- Crescent City;
- City of Willits; and
- Sonoma County Water Agency

The Recycled Water Policy recognizes the fact that some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed water quality objectives in the applicable Basin Plans or cause degradation of high quality waters, and that not all Basin Plans include adequate implementation procedures for achieving or ensuring compliance with the water quality objectives and the Antidegradation Policy for salt or nutrients. The Recycled Water Policy finds that the appropriate way to address salt and nutrient issues is through the development of regional or subregional Salt and Nutrient Management Plans (SNMPs) rather than through imposing requirements solely on individual recycled water projects.

This Recycled Water Policy describes permitting criteria that are intended to streamline the permitting of the vast majority of recycled water projects. The intent of this streamlined permit process is to expedite the implementation of recycled water projects in a manner that implements state and federal water quality laws while allowing the Regional Water Boards to focus their limited resources on projects that require substantial regulatory review due to unique site-specific conditions.

The State Water Board acknowledges that all projects that involve recycled water recharge to groundwater must be reviewed and permitted on a site-specific basis. Activities involving the disposal of waste that could impact high quality waters are required to implement best practicable treatment or control of the discharge necessary to ensure that pollution or nuisance will not occur, and the highest water quality consistent with the maximum benefit to the people of the state will be maintained, as per the Antidegradation Policy. These findings are made by the Regional Water Board after public review and hearing

Water Quality Control Policy for Low-Threat Underground Storage Tanks Case Closure, State Water Board Resolution No. 2012-0016 (Low-Threat UST Closure Policy).
The State Water Board believes it is in the best interest of the people of the state that unauthorized releases be prevented and cleaned up to the extent practicable in a manner that protects human health, safety and the environment. The State Water Board also recognizes that the technical and economic resources available for environmental restoration are limited, and that the highest priority for these resources must be the protection of human health and environmental receptors. Program experience has demonstrated the ability of remedial technologies to mitigate a substantial fraction of a petroleum contaminant mass with the investment of a reasonable level of effort. Experience has also shown that residual contaminant mass usually remains after the investment of reasonable effort, and that this mass is difficult to completely remove regardless of the level of additional effort and resources invested.

As noted above, State Water Board Resolution 92-49, is a state policy for water quality control and applies to petroleum UST releases, in addition to other wastes. State Water Board Resolution 92-49 directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. Any alternative level of water quality less stringent than background must be consistent with the maximum benefit to the people of the state, not unreasonably affect current and anticipated beneficial use of affected water, and not result in water quality less than that prescribed in the water quality control plan for the basin within which the site is located. Resolution No. 92-49 does not require that the requisite level of water quality be met at the time of case closure; it specifies compliance with cleanup goals and objectives within a reasonable time frame.

The Low-Threat Closure Policy has general criteria that must be satisfied by all candidate sites are listed as follows:

a. The unauthorized release is located within the service area of a public water system;
b. The unauthorized release consists only of petroleum;
c. The unauthorized ("primary") release from the UST system has been stopped;
d. Free product has been removed to the maximum extent practicable;
e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed;
f. Secondary source has been removed to the extent practicable;
g. Soil or groundwater has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15; and
h. Nuisance as defined by Water Code section 13050 does not exist at the site.

Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems, State Water Resources Control Board Resolution No. 2012-0032 (OWTS Policy)
The purpose of the OWTS Policy is to allow the continued use of OWTS, while protecting water quality and public health. To accomplish this purpose, the OWTS Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS. The OWTS Policy only authorizes subsurface disposal of domestic strength, and in limited instances high strength, wastewater and establishes minimum requirements for the permitting, monitoring, and operation of OWTS for protecting beneficial uses of waters of the state and preventing or correcting conditions of pollution and nuisance.

The OWTS Policy implements criteria for siting, design, operation implements levels (tiers) of requirements based upon potential threat to water quality that may be caused by the OWTS. The tiers are as follows:

Tier 0 provides a conditional waiver of waste discharge requirements for existing, properly functioning systems that are not failing or in need of corrective action (Tier 4) and are not determined to be contributing to an impairment of surface water (Tier 3). Tier 0 conditions for existing OWTS are specified in section 6 of the OWTS Policy.

Tier 1 provides a conditional waiver of waste discharge requirements for new or replacement systems that comply with specific criteria intended to be protective of water quality. The criteria are intentionally conservative (similar to those previously adopted by the Regional Water Board) to ensure that use of such systems, without specific monitoring, will not result in water quality impairment. Tier 1 conditions for low-risk OWTS are specified in sections 7 and 8 of the OWTS Policy.

Tier 2 provides alternative criteria to be implemented by local governing jurisdictions in areas with approved Local Agency Management Plans (LAMPs). At its discretion, the local agency may implement a LAMP that provides a similar level of water quality protection while addressing unique geologic conditions or management approaches. Where LAMPs

have been approved by a regional board, the LAMP requirements supersede Tier 1 criteria. Tier 2 requirements for LAMPs are described in section 9 of the OWTS Policy.

Tier 3 provides special conditions for OWTS located near impaired waters listed in Attachment 2 of the OWTS Policy. New, existing, and replacement OWTS must comply with the applicable Total Maximum Daily Load (TMDL) implementation program, or special provisions contained in a LAMP. Where there is no TMDL or special provisions in place, new or replacement OWTS within 600 feet of certain impaired waters listed in Attachment 2 of the OWTS Policy must meet advanced protection requirements specified in the policy. The Tier 3 advanced treatment requirements are in section 10 of the OWTS Policy.

Tier 4 specifies corrective actions for failing OWTS. After completion of corrective action and repair, the onsite system would then return to Tier 1, Tier 2, or Tier 3 (whichever is appropriate in the specific circumstances). Tier 4 criteria for OWTS requiring corrective action are specified in section 11 of the OWTS Policy.

In accordance with Section 4.2.1 of the OWTS Policy, the Regional Water Board will continue to implement its existing Basin Plan requirements pertaining to onsite systems within the Russian River watershed until it adopts the Russian River TMDL, at which time it will comply with section 4.2 of the OWTS Policy for the Russian River watershed. The Russian River watershed includes the Laguna de Santa Rosa.

The policies described above establish the most significant of the regulatory authorities implemented by the Regional Water Board with respect to the protection of water quality from discharges of chemical constituents, including toxic constituents.

2.2.1 Existing Program of Implementation for Chemical Constituents and Groundwater Toxicity

Water quality-based effluent limitations are established in Regional Water Board permits, orders, and other regulatory actions primarily to ensure that the water quality is attained or maintained at a level that protects aquatic life, human health, and other beneficial uses from adverse impacts. When developing effluent limitations and other numeric limits in permits, orders, and other regulatory actions, staff currently implements the Basin Plan and all of the policies and plans described above, as appropriate. In general, the methods that staff uses to determine the most appropriate discharge limitation or cleanup level include:

1) Characterize the waste and characteristics of the site;
2) Identify the discharge point and any of the surrounding area that may be threatened by discharge of waste;
3) Identify the beneficial uses of the waterbody in question from which to determine the most sensitive potential receptors for which discharge limitations/cleanup levels must be designed;
4) Identify the relevant existing narrative and/or numeric water quality objectives within the Basin Plan;

5) Apply other relevant policies and procedures (e.g., SIP, Resolution No. 92-49, Resolution No. 68-16); and
6) Apply (a) the relevant numeric Basin Plan objectives; (b) the most appropriate numeric criteria derived from the translation of relevant narrative Basin Plan objectives; and (c) the most appropriate numeric criteria derived from other relevant State or Federal laws, regulations, plans or policies, whichever provides the best and most appropriate protection of the most sensitive beneficial uses.

For a better understanding of the existing regulatory framework, each of the significant water quality protection programs implemented by the Regional Water Board are described in more detail below.

Wastewater
NPDES program is a federal program, which has been delegated to the State of California for implementation. Wastewater NPDES permits are issued to regulate the discharge of municipal wastewater or industrial process, cleaning, or cooling wastewaters; commercial wastewater; treated groundwater from cleanup projects; or other wastes discharged to surface waters, including federal jurisdictional wetlands. NPDES permits may also serve as WDRs that implement additional provisions of state law. General NPDES permits are issued under the Site Cleanup Program to regulate the year-round discharge to surface waters of highly treated groundwater extracted from cleanup projects involving volatile organic compounds.

All municipalities within the North Coast Region that discharge wastewater to surface waters are currently regulated by NPDES permits issued by the Regional Water Board. Industrial, commercial, cleanup or other operations that discharge wastes directly into municipal, or other publicly owned wastewater collection systems are not required to obtain an NPDES permit from the Regional Water Board, but must comply with waste discharge requirements issued by the appropriate public entity.

For NPDES permits, the implementation procedures described in the SIP (and summarized in Section 2.2 above) apply, in conjunction with the Basin Plan water quality objectives for developing effluent limits. Section three of the Basin Plan states "Whenever several different objectives exist for the same water quality parameter, the strictest objective applies. Additionally, the SIP states "If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies." Staff has used the process contained in the SIP for setting effluent limits for wastewater NPDES permits since it was adopted in 2000.

WDRs are the state permitting authority that is used in conjunction with an NDPES permit or alone when there is no discharge to federal waters. WDRs regulating discharges of waste to land generally follow the process for establishing effluent limits as described in the State Administrative Procedures Manual (APM). For WDRs, such levels are determined on a case-by-case basis considering the nature of the contaminants, the type of soil, the depth to groundwater, distance to surface water, and other hydrogeologic characteristics.

Non-municipal waste discharges typically regulated by NPDES and/or WDR permits may include:

- Canneries
- Dairies
- Mines
- Mobile home parks
- Fish hatcheries
- Wineries and other food processing plants
- Groundwater cleanup projects
- Hardboard manufacturing plants
- Pulp mills
- Sawmills

The Non-Chapter 15 Permitting, Surveillance and Enforcement Program is a State mandated program under which WDRs are issued to regulate the discharge of municipal, industrial, commercial and other wastes to land only. If the waste discharge consists only of non-process storm water, it may be regulated under the NPDES storm water program. The discharge of waste to surface water (rivers, streams, lakes, wetlands, drains, and the Pacific Ocean) is regulated under the NPDES program.

All municipalities within the North Coast Region that discharge wastewaters or waste solids to land are currently regulated by WDRs issued by the Regional Water Board or the State Water Board (e.g. General WDRs for Recycled Water, OTWS and biosolids). Industrial, commercial, or other operations that discharge to municipal or other publicly owned wastewater collection systems are not required to obtain WDRs under this program, but must comply with local requirements or pre-treatment requirements issued by the appropriate public entity. Non-municipal waste discharges typically regulated by WDRs under the Non-Chapter 15 Permitting, Surveillance and Enforcement program within the North Coast Region include: dairies, mines, mobile home parks, sawmills, and wineries.

Storm Water

In addition to NPDES wastewater permits, there are four statewide NPDES storm water permits issued by the State Water Board and implemented by individual Regional Water Boards. These permits are for the control of storm water runoff from: 1) industrial facilities; 2) construction sites; 3) municipalities; and 4) Caltrans existing highway system. The NPDES storm water permit program is implemented with an iterative process in which facilities implement best management practices and monitor and improve management practices, as monitoring data indicates the need.

The goal of the Storm Water Program is to prevent or minimize the discharge of pollutants contained in storm water runoff to waters of the state. Common pollutants contained in storm water runoff include:

- Sediment: construction or other activities expose and loosen soils, while vehicles break up pavement. Excessive sediment in water can affect the respiration, growth and reproduction of aquatic organisms, cause aesthetic impacts to receiving streams and affect spawning habitat of salmonids.
- Nutrients: Sources include fertilizer, lawn clippings, and car exhaust, which contain nutrients like phosphorous and nitrogen. An overabundance of nutrients can accelerate the growth of algae and affect the availability of DO.
- Heavy metals and toxic chemicals: Sources include cars (brake pads, engine wear, etc.), pesticides, and herbicides. Maintaining and cleaning transportation vehicles can release solvents, paint, rust, and lead. These chemicals may poison organisms or cause serious birth defects.
- Bacteria: Sources include failing septic tanks, sewer overflows, decaying organic material and the improper disposal of household pet fecal material. Some bacteria found in storm water runoff can result in disease. Beach closures result from high bacteria levels.
- Trash and litter: Sources include rural, urban, commercial, and industrial areas, highways, and parks. Trash is a significant pollutant that adversely affect beneficial uses including but not limited to uses that support aquatic life, wildlife and public health.

Land Disposal Program
The California Code of Regulations (CCR) Title 27 contains the regulatory requirements for treatment, storage, processing or disposal of solid wastes. The Land Disposal Program regulates the discharge to land of certain solid and liquid wastes. These wastes include designated wastes, nonhazardous solid wastes and inert wastes. In general, these wastes cannot be discharged directly to the ground surface without impacting groundwater or surface water, and therefore must be contained in waste management units (e.g., landfills) to isolate them from the environment.

Site Cleanup Program
The Site Cleanup Program (SCP) is designed to protect and restore water quality from spills, leaks, and similar discharges. The SCP program has several components at the North Coast Regional Water Quality Control Board:

- Complaint response
- Non-permitted discharge investigations
- Site cleanups under the oversight of the Regional Water Board
- Site cleanups pursuant to methods analogous to procedures in the Resource Conservation and Recovery Act
- Cleanups performed by local agencies.

Complaint response and investigations are coordinated with local agencies, and enforcement actions on non-permitted discharges may occur, either through coordination with the district attorney or through administrative processes of the Regional Water Board. Cleanups may be occurring voluntarily by responsible parties who have recognized the

threat from non-permitted discharges. Voluntary or directed cleanups may occur under orders issued pursuant to section 13304 of the California Water Code (CWC), or through technical reports required pursuant to CWC section 13267. State Water Board Resolution 92-49 is the over-riding policy guiding the Regional Water Board's Spills Leaks, Investigations and Cleanup (SLIC) program.

Cleanup levels for soil are determined based on the threat to water quality. Such levels are determined on a case-by-case basis considering the nature of the contaminants, the type of soil, the depth to groundwater, distance to surface water, and other hydrogeologic characteristics. Cleanup levels for groundwaters and surface waters are determined based on application of existing laws, regulations, plans, and policies. In general, waters shall be cleaned up to: background, where feasible; to levels achievable through best available technology; and in all cases at least to water quality objectives. The appropriate water quality objective is determined based on the beneficial uses of waters. The water quality objective selected for a given receiving water is the objective protective of the most sensitive beneficial use.

For groundwater cleanup orders, staff applies footnote #2 to Table 3-2 of the Basin Plan (page 3-11), which states: "The values included in this table are maximum contaminant levels for the purposes of groundwater and surface water discharges and cleanup. Other water quality objectives (e.g., taste and odor criteria or other secondary MCLs) and policies (e.g., State Water Board "Policy With Respect to Maintaining High Quality Waters in California") that are more stringent may apply."

The State Water Board has developed, and updates regularly, a document entitled "A Compilation of Water Quality Goals," and an associated database of chemical constituent criteria developed by other federal or California state agencies. The State Water Board maintains the database, Water Quality Goals online[17], on its website which is freely available to all the regions and the public. It also publishes a searchable database and spreadsheet including numeric values recommended to implement selected water quality objectives as regular updates in the "Water Quality Goals" report. The numeric criteria represented in the database includes:

- Drinking water standards (a.k.a., MCLs) developed by the DDW
- Maximum Contaminant Level Goals (MCL goals or MCLG) developed by USEPA
- California Public Health Goals (PHGs) developed by California Environmental Protection Agency (Cal/EPA)
- California Drinking Water Notification and Response Levels developed by the DDW
- Cancer Potency Factors developed by the Office of Environmental and Human Health Assessment (OEHAA)
- Reference doses and cancer risk in drinking water as described in the Integrated Risk Information System (IRIS) developed by USEPA

[17] http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/

- Drinking Water Health Advisories and Water Quality Advisories developed by USEPA
- Suggested No-Adverse-Response Levels (SNARLs) developed by the National Academy of Sciences
- Proposition 65 Safe Harbor Levels developed by OEHHA
- California Toxics Rule and National Toxics Rule values developed USEPA
- California Ocean Plan Objectives developed by the State Water Board
- National Recommended Water Quality Criteria developed by USEPA
- Agricultural Water Quality Criteria developed by the Food and Agriculture Organization of the United Nations
- Taste and Odor Criteria developed by USEPA
- Other numeric criteria.

Staff uses this compilation, among other tools, to select the most appropriate numeric limit to protect the most sensitive beneficial use susceptible to impact from a given project or discharge. Staff regularly uses this resource for identifying the most protective threshold for chemical constituents or toxicity to protect human health or aquatic life when developing permits, orders and other regulatory actions for the protection of beneficial uses.

For narrative water quality objectives associated with sediment Regional Water Board staff developed the *Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices* (July 2006), which includes desired conditions expressed through the following indices: benthic macroinvertebrate assemblage, embeddedness, large wood debris frequency and volume, pool distribution, substrate composition, thalweg profile, and V* percentage. Turbidity and D50 are also discussed.

The desired condition values are numeric in nature and are directly measurable by known monitoring methods. Therefore, they can provide a means of assessing attainment, or recovery toward attainment, with the narrative water quality objectives for suspended material, settleable material, and sediment in regards to salmonid freshwater habitat. The report satisfies and fulfills the direction from the Regional Water Board to complete a scientific document addressing salmonid freshwater habitat properly functioning conditions for sediment-related parameters. This direction was given to the Executive Officer on November 29, 2004, in Resolution No. R1-2004-0087, which established the *Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters in the North Coast Region*.

2.2.2 Existing Program of Implementation for Dissolved Oxygen

The conceptual model for DO (Figure 1 in Appendix D) specifically identifies the following activities as influencing the presence of DO in an aquatic system: agricultural practices, forestry practices, fossil fuel extraction and refinement practices, other mining practices, construction practices, residential and commercial practices, recreational practices, and industrial practices. These activities have the potential to act as sources of: animal wastes, mining wastes, septic system leachate, landfill leachate, fertilizers, sewage treatment plant

effluent, industrial effluent, industrial emissions, vehicle emissions, storm water discharge, fire ash and smoke, and other historic or existing sources. In addition, these activities have the potential to alter environmental conditions in such a way as to alter the natural cycle of DO availability. For example, the installation of impoundments, alteration of land and canopy covers, and alteration of the stream channel can impact or alter the natural pattern and range of DO in an aquatic system. Within this context, DO can be viewed as a response variable, reacting to the intersection of any number of other factors to result in ambient conditions which may or may not be supportive of existing beneficial uses.

Specifically, the conceptual model illustrates the importance of developing management measures designed to:

- Reduce the threat of discharge of anthropogenic sources of nutrients, and organic matter including the discharge of agricultural return flows,
- Reduce the threat of discharge of warm water to a waterbody, including the discharge of agricultural return flows;
- Reduce the threat of anthropogenic sources of erosion and sediment delivery;
- Reduce the threat of direct alteration of the stream channel, such as through gravel mining;
- Reduce the threat of disturbance to wetlands, the flood plain and riparian zone;
- Reduce the threat of anthropogenic alteration to the natural pattern and range of flows, including storm water management, groundwater protection, and control of water impoundment and withdrawal;
- Reduce the threat of loss or alteration (e.g., reduction in flow or increase in temperature) of cold water springs; and,
- Increase the availability of channel forming material (e.g., large woody debris) in the stream channel, riparian zone, and floodplain.

As described below, there are numerous existing programs of implementation that are designed to accomplish the goals as stated above in the conceptual model. As a general matter, the cornerstones of the existing regulatory programs are: 1) the waste discharge prohibition; 2) WDRs; and 3) waivers of WDRs. As an example of the waste discharge prohibition, the Regional Water Board prohibits the point source discharge of wastes to all the waters of the region except the Mad, Eel, and Russian rivers during the period of May 15 through September 30 and under specific flow regimes. The Regional Water Board can also issue new prohibitions to address specific water quality issues, as needed. For example, in 2010, the Regional Water Board adopted a prohibition against unauthorized discharges of waste that violate water quality standards in the Klamath River basin.

WDRs allow the discharge of waste to a water of the North Coast Region; but, they identify the pollutants of concern and the discharge limits necessary to ensure the protection of water quality, including compliance with the ambient water quality objectives and antidegradation policy of the Basin Plan. WDRs can be issued as individual permits (e.g., for a particular facility), group permits (e.g., for facilities within a particular watershed), or

general permits (e.g., for facilities conducting a particular activity). The Regional Water Board also has the option to issue a waiver of requirements for facilities whose operations meet certain conditions if it is in the public interest.

In 1988, the State Water Board issued a Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (Nonpoint Source Policy) outlining a three-tiered program by which nonpoint source pollution was to be controlled in the state. The first tier of the program called upon landowners to voluntarily comply with the Basin Plan, including compliance with water quality objectives. The Nonpoint Source Policy was updated in 2004 and more plainly made clear the obligation of the Regional Water Board to ensure compliance with the Basin Plan, even from nonpoint sources of pollution.

In 2000, the State Water Board developed a strategy for prioritizing those sources of nonpoint source pollution requiring immediate state attention. The "Plan for California's Nonpoint Source Pollution Control Program" (SWRCB 2000) identifies 6 categories of activities requiring priority management for the control of nonpoint source pollution in the state, including:

- Agriculture;
- Forestry;
- Urban areas;
- Marinas and recreational boating;
- Hydromodification; and
- Wetlands, riparian areas and vegetated treatment systems.

For these 6 categories of activities, the State Water Board (2000) further identifies 61 management measures to be implemented over a 15-year schedule, beginning in 1998. The Regional Water Board currently implements a number of programs that reasonably and adequately address water quality issues such as DO. These include programs designed to control:

- Point source discharge of waste to waters of the state either directly or via storm water. These discharges are regulated under NPDES program;
- Discharge of waste as a result of timber operations;
- Discharge of waste as a result of dredging, filling, or other activities that directly, indirectly, or cumulatively affect streams and wetlands that require Water Quality Certifications pursuant to CWA Section 401 (401 Certification Program);
- Discharges of waste to land;
- Total Maximum Daily Loads (TMDLs) for waterbodies listed as impaired on the CWA 303(d) list.

Timber Operations
The Regional Water Board has been regulating discharges from logging and associated activities since 1972. The North Coast Region includes 12% of the state's land area yet

produces 40% of the private timber harvested within the state and 40% of the state's total runoff. Most of the public lands involved in timber harvest activities within the North Coast Region are under the jurisdiction of the U.S. Forest Service (USFS). The State Water Board and the USFS entered into a Management Agency Agreement (MAA) in 1981 for overseeing water quality protection on National Forest System lands, including timber sales. The MAA requires the USFS to implement approved best management practices for water quality protection. In June 2010, the Regional Water Board adopted Order No. R1-2010-0029, Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands in the North Coast Region. This order replaced a previous 2004 waiver that covered only timber harvesting operations (Order No. R1-2004-0015). The USFS must seek coverage under the 2010 Waiver prior to beginning timber harvest activities. Regional Water Board staff provides comments and conducts inspections on proposed timber sales and other projects to ensure USFS complies with the 2010 Waiver.

Timber harvesting activities have the potential to impact waters of the state by felling, yarding, and hauling of trees; constructing and reconstructing roads; constructing, reconstructing or removing watercourse crossings; applying herbicides and pesticides; broadcast burning; and other site preparation activities. Excessive soil erosion and sediment delivery associated with these activities can impact the beneficial uses of water by: silting over fish spawning habitat; clogging drinking water intakes; filling pools creating shallower, wider, and warmer streams; increasing downstream flooding; creating unstable stream channels; endangering wildlife; and losing riparian habitat. Timber harvesting in the riparian zone can adversely affect stream temperatures by removing stream shading, which is especially a concern for temperature impaired waterbodies. Removal of large diameter trees in the riparian zone also adversely affects the amount of large woody debris available for the development of the complex instream features necessary to provide food sources and refuge for juvenile and adult fish and stabilize the bed and banks of streams at a wide range of flows.

For private lands, the California Department of Forestry and Fire Protection (CALFire) is the lead agency responsible for regulating timber harvesting under the California Forest Practice Rules (FPRs). The State Water Board, State Board of Forestry, and CALFire entered into a Management Agency Agreement (MAA) in 1988 for overseeing water quality protection on Timber Harvest Plan (THPs). Under the MAA, the Regional Water Board is a responsible agency and plays an advisory role.

The FPRs require the submission and approval of a THP prior to starting most timber operations. Once a THP is submitted to CALFire, Regional Water Board staff reviews the plan as a "Review Team" member, along with the Department of Fish and Wildlife, California Geological Survey, and CALFire. The Regional Water Board has two roles in the review of timber harvest plans, non-industrial timber management plans (NTMPs), and other commercial timber harvest projects on private lands:

- The Regional Water Board issues WDRs and Waivers of WDRs (Waiver), which establish conditions or requirements to control discharges of waste to waters of the state.
- As a member of the CALFire Review Team the Regional Water staff also participates in pre-harvest inspections and submits comments and recommendations to CALFire to protect water quality and to avoid violations of Regional Water Board regulations.

Following plan approval by CALFire, and prior to beginning timber harvest activities, landowners must apply for coverage under: the General WDRs (Order No. R1-2004-0030); the Categorical Waiver (Order No. R1-2009-0038); the NTMP General WDRs (Order No. R1-2013-0005); an individual waiver or WDR; or in some cases a watershed-wide WDR.

Regional Water Board staff may also perform the following activities to protect the beneficial uses of water and regulate timber harvest activities: attend active and post-harvest inspections of approved plans; review Habitat Conservation Plans and Sustained Yield Plans; perform and review watershed analyses; participate in meetings of the Board of Forestry and CALFire; take enforcement actions and investigate complaints; assess conversions of timber lands to other land uses; and participate in TMDL development and implementation.

401 Certification

Anyone proposing to conduct a project that requires a federal permit or involves dredge or fill activities that may result in a discharge to federal waters and/or waters of the state is required to obtain a CWA Section 401 Water Quality Certification and/or Waste Discharge Requirements (Dredge/Fill Projects) from the Regional Water Board, verifying that the project activities will comply with state water quality standards. The most common federal permit for dredge and fill activities is a CWA Section 404 permit issued by the U.S. Army Corps of Engineers.

Section 401 of the CWA grants each state the right to ensure that the state's interests are protected on any federally permitted activity occurring in or adjacent to waters of the state. In California, the State Water Board (including its nine Regional Water Boards) is the agency mandated to ensure protection of the state's waters. So if a proposed project requires a U.S. Army Corps of Engineers CWA Section 404 permit, falls under other federal jurisdiction, and has the potential to impact waters of the state, the Regional Water Board can deny or certify the proposed project with conditions under CWA Section 401. The Regional Water Board will use USEPA's section 404(b)(1), "Guidelines for Specifications of Disposal Sites for Dredge or Fill Material, in determining the circumstances under which filling of waters of the state might be permitted.

However, if a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to waters of the state, the Regional Water Board has the option to regulate the project under Porter-Cologne Act in the form of WDRs or a Waiver.

The Regional Water Board will refer to the following for guidance when permitting or otherwise acting on dredge or fill projects:

- Governor's Executive Order W-59-93 (signed August 23, 1993; also known as the California Wetlands Conservation Policy);
- Senate Concurrent Resolution No. 28;
- California Water Codes section 13142.5 (applies to coastal marine wetlands).

The goals of the California Wetlands Conservation Policy include ensureing "no overall net loss," achieving a "long-term net gain in the quantity, quality, and permanence of wetlands acreage and value…", and reducing "procedural complexity in the administration of state and federal wetlands conservation programs."

Senate Concurrent Resolution No. 28 states, "It is the intent of the legislature to preserve, protect, restore, and enhance California's wetlands and the multiple resources which depend on them for the benefit of the people of the state."

California Water Code section 13142.5 states, "Highest priority shall be given to improving or eliminating discharges that adversely affect…wetlands, estuaries, and other biological sensitive sites."

In addition, California Department of Fish and Wildlife (CDFW) may regulate the project through the Streambed Alteration Agreement process. CDFW issues Streambed Alteration Agreements when project activities have the potential to impact intermittent and perennial streams, rivers, or lakes.

Total Maximum Daily Loads
The Regional Water Board develops and implements TMDLs for water bodies listed as impaired on the 303(d) list. Waterbodies listed as impaired due to reduced DO are detailed in Section 1.3.2 of this staff report. The final 2012 305(b) and 303(d) Integrated Report is available at:
http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/303d/

The Regional Water Board has approved a TMDL for DO in the Shasta River, including an implementation plan. Additionally, in 2010 the Regional Water Board approved a TMDL for the Klamath River including 1) Site Specific Dissolved Oxygen Objectives for the Klamath River; (2) an Action Plan for the Klamath River TMDL addressing temperature, DO, nutrient, and microcystin impairments in the Klamath River; and (3) an Implementation Plan for the Klamath and Lost River Basins.

Summary
There are a number of existing State Water Board policies that, in addition to Basin Plan requirements, are implemented for the protection of human health and aquatic life including the State Water Board Resolutions No. 68-16 (Antidegradation), No. 88-63 (Sources of Drinking Water), and No. 92-49 (Cleanup and Abatement Policy). In addition,

there are numerous existing programs of implementation addressing the actions needed to treat wastewater and storm water prior to its discharge to waters of the state, as well as programs established to remediate pollution from discharges to state waters. Each of these existing programs has its own evolving and improving set of actions needed to achieve compliance with water quality objectives. As best available technologies improve, so too do the efficiencies in cost and program implementation. In addition, each of these existing programs includes general, site-specific, or project-specific time schedules for which compliance will be met. Finally, each the existing programs described above has a variety of monitoring and reporting requirements in order to demonstrate compliance with water quality objectives.

2.3 Water Quality Conditions that Could Reasonably be Achieved

As discussed above in Section 2.2, various programs of implementation exist to address chemical constituents, toxicity and dissolved oxygen. Implementation programs span both point source and nonpoint source activities and discharges. Through the coordinated control of factors, water quality in the North Coast has been preserved, maintained and restored in an enumerable amount of cases from groundwater remediation success stories to wastewater treatment systems infrastructure upgrades to stream habitat improvement projects. Therefore, it is reasonable to expect that the water quality objective amendment will result in the continuation of this pattern. Spills, leaks, accidents and treatment system failures will likely continue to lead to violations of water quality objectives. However, with well-established regulatory programs, public support, stakeholder engagement and strengthening partnerships the North Coast Region can reasonably expect the continued preservation, maintenance and restoration of water quality.

TMDL source control programs, watershed stewardship activities, groundwater assessments at basin scale, and wastewater treatment programs will promote proactive approaches to maintain and achieve water quality standards. Additionally, key programs such as cleanups and watershed restoration will continue to operate to restore polluted or impaired waters of the state to levels that support beneficial uses. Therefore, regulatory actions following the anticipated adoption of this amendment will yield requirements equivalent to that which results from current regulatory practices and to that which is necessary for the reasonable protection of beneficial uses.