APPENDIX B
ATTACHMENTS TO COMMENT LETTER NO. 7
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Staff Report on Burrowing Owl Mitigation

State of California

Natural Resources Agency

Department of Fish and Game

March 7, 2012[1]

[1] This document replaces the Department of Fish and Game 1995 Staff Report On Burrowing Owl Mitigation.

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INTRODUCTION AND PURPOSE

Maintaining California's rich biological diversity is dependent on the conservation of species and their habitats. The California Department of Fish and Game (Department) has designated certain species as "species of special concern" when their population viability and survival is adversely affected by risk factors such as precipitous declines or other vulnerability factors (Shuford and Gardali 2008). Preliminary analyses of regional patterns for breeding populations of burrowing owls (*Athene cunicularia*) have detected declines both locally in their central and southern coastal breeding areas, and statewide where the species has experienced modest breeding range retraction (Gervais et al. 2008). In California, threat factors affecting burrowing owl populations include habitat loss, degradation and modification, and eradication of ground squirrels resulting in a loss of suitable burrows required by burrowing owls for nesting, protection from predators, and shelter (See Appendix A).

The Department recognized the need for a comprehensive conservation and mitigation strategy for burrowing owls, and in 1995 directed staff to prepare a report describing mitigation and survey recommendations. This report, "1995 Staff Report on Burrowing Owl Mitigation," (Staff Report) (CDFG 1995), contained Department-recommended burrowing owl and burrow survey techniques and mitigation measures intended to offset the loss of habitat and slow or reverse further decline of this species. Notwithstanding these measures, over the past 15+ years, burrowing owls have continued to decline in portions of their range (DeSante et al. 2007, Wilkerson and Siegel, 2010). The Department has determined that reversing declining population and range trends for burrowing owls will require implementation of more effective conservation actions, and evaluating the efficacy of the Department's existing recommended avoidance, minimization and mitigation approaches for burrowing owls.

The Department has identified three main actions that together will facilitate a more viable, coordinated, and concerted approach to conservation and mitigation for burrowing owls in California. These include:

1. Incorporating burrowing owl comprehensive conservation strategies into landscape-based planning efforts such as Natural Community Conservation Plans (NCCPs) and multi-species Habitat Conservation Plans (HCPs) that specifically address burrowing owls.
2. Developing and implementing a statewide conservation strategy (Burkett and Johnson, 2007) and local or regional conservation strategies for burrowing owls, including the development and implementation of a statewide burrowing owl survey and monitoring plan.
3. Developing more rigorous burrowing owl survey methods, working to improve the adequacy of impacts assessments; developing clear and effective avoidance and minimization measures; and developing mitigation measures to ensure impacts to the species are effectively addressed at the project, local, and/or regional level (the focus of this document).

This Report sets forth the Department's recommendations for implementing the third approach identified above by revising the 1995 Staff Report, drawing from the most relevant and current knowledge and expertise, and incorporating the best scientific information

available pertaining to the species. It is designed to provide a compilation of the best available science for Department staff, biologists, planners, land managers, California Environmental Quality Act (CEQA) lead agencies, and the public to consider when assessing impacts of projects or other activities on burrowing owls.

This revised Staff Report takes into account the California Burrowing Owl Consortium's Survey Protocol and Mitigation Guidelines (CBOC 1993, 1997) and supersedes the survey, avoidance, minimization and mitigation recommendations in the 1995 Staff Report. Based on experiences gained from implementing the 1995 Staff Report, the Department believes revising that report is warranted. This document also includes general conservation goals and principles for developing mitigation measures for burrowing owls.

DEPARTMENT ROLE AND LEGAL AUTHORITIES

The mission of the Department is to manage California's diverse fish, wildlife and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitats necessary to maintain biologically sustainable populations of those species (Fish and Game Code (FGC) §1802). The Department, as trustee agency pursuant to CEQA (See CEQA Guidelines, §15386), has jurisdiction by law over natural resources, including fish and wildlife, affected by a project, as that term is defined in Section 21065 of the Public Resources Code. The Department exercises this authority by reviewing and commenting on environmental documents and making recommendations to avoid, minimize, and mitigate potential negative impacts to those resources held in trust for the people of California.

Field surveys designed to detect the presence of a particular species, habitat element, or natural community are one of the tools that can assist biologists in determining whether a species or habitat may be significantly impacted by land use changes or disturbance. The Department reviews field survey data as well as site-specific and regional information to evaluate whether a project's impacts may be significant. This document compiles the best available science for conducting habitat assessments and surveys, and includes considerations for developing measures to avoid impacts or mitigate unavoidable impacts.

CEQA

CEQA requires public agencies in California to analyze and disclose potential environmental impacts associated with a project that the agency will carry out, fund, or approve. Any potentially significant impact must be mitigated to the extent feasible. Project-specific CEQA mitigation is important for burrowing owls because most populations exist on privately owned parcels that, when proposed for development or other types of modification, may be subject to the environmental review requirements of CEQA.

Take

Take of individual burrowing owls and their nests is defined by FGC section 86, and prohibited by sections 3503, 3503.5 and 3513. Take is defined in FGC Section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill."

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the United States and Canada, Japan, Mexico, and Russia for the protection of migratory birds, including the burrowing owl (50 C.F.R. § 10). The MBTA protects migratory bird nests from possession, sale, purchase, barter, transport, import and export, and collection. The other prohibitions of the MBTA - capture, pursue, hunt, and kill - are inapplicable to nests. The regulatory definition of take, as defined in Title 50 C.F.R. part 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect. Only the verb "collect" applies to nests. It is illegal to collect, possess, and by any means transfer possession of any migratory bird nest. The MBTA prohibits the destruction of a nest when it contains birds or eggs, and no possession shall occur during the destruction (see Fish and Wildlife Service, Migratory Bird Permit Memorandum, April 15, 2003). Certain exceptions to this prohibition are included in 50 C.F.R. section 21. Pursuant to Fish & Game Code section 3513, the Department enforces the Migratory Bird Treaty Act consistent with rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.

Regional Conservation Plans

Regional multiple species conservation plans offer long-term assurances for conservation of covered species at a landscape scale, in exchange for biologically appropriate levels of incidental take and/or habitat loss as defined in the approved plan. California's NCCP Act (FGC §2800 et seq.) governs such plans at the state level, and was designed to conserve species, natural communities, ecosystems, and ecological processes across a jurisdiction or a collection of jurisdictions. Complementary federal HCPs are governed by the Endangered Species Act (7 U.S.C. § 136, 16 U.S.C.§ 1531 et seq.) (ESA). Regional conservation plans (and certain other landscape-level conservation and management plans), may provide conservation for unlisted as well as listed species. Because the geographic scope of NCCPs and HCPs may span many hundreds of thousands of acres, these planning tools have the potential to play a significant role in conservation of burrowing owls, and grasslands and other habitats.

Fish and Game Commission Policies

There are a number of Fish and Game Commission policies (see FGC §2008) that can be applied to burrowing owl conservation. These include policies on: Raptors, Cooperation, Endangered and Threatened Species, Land Use Planning, Management and Utilization of Fish and Wildlife on Federal Lands, Management and Utilization of Fish and Wildlife on Private Lands, and Research.

GUIDING PRINCIPLES FOR CONSERVATION

Unless otherwise provided in a statewide, local, or regional conservation strategy, surveying and evaluating impacts to burrowing owls, as well as developing and implementing avoidance, minimization, and mitigation and conservation measures incorporate the following principles. These principles are a summary of Department staff expert opinion and were used to guide the preparation of this document.

1. Use the Precautionary Principle (Noss et al.1997), by which the alternative of increased conservation is deliberately chosen in order to buffer against incomplete knowledge of burrowing owl ecology and uncertainty about the consequences to burrowing owls of potential impacts, including those that are cumulative.
2. Employ basic conservation biology tenets and population-level approaches when determining what constitutes appropriate avoidance, minimization, and mitigation for impacts. Include mitigation effectiveness monitoring and reporting, and use an adaptive management loop to modify measures based on results.
3. Protect and conserve owls in wild, semi-natural, and agricultural habitats (conserve is defined at FGC §1802).
4. Protect and conserve natural nest burrows (or burrow surrogates) previously used by burrowing owls and sufficient foraging habitat and protect auxiliary "satellite" burrows that contribute to burrowing owl survivorship and natural behavior of owls.

CONSERVATION GOALS FOR THE BURROWING OWL IN CALIFORNIA

It is Department staff expert opinion that the following goals guide and contribute to the short and long-term conservation of burrowing owls in California:

1. Maintain size and distribution of extant burrowing owl populations (allowing for natural population fluctuations).
2. Increase geographic distribution of burrowing owls into formerly occupied historical range where burrowing owl habitat still exists, or where it can be created or enhanced, and where the reason for its local disappearance is no longer of concern.
3. Increase size of existing populations where possible and appropriate (for example, considering basic ecological principles such as carrying capacity, predator-prey relationships, and inter-specific relationships with other species at risk).
4. Protect and restore self-sustaining ecosystems or natural communities which can support burrowing owls at a landscape scale, and which will require minimal long-term management.
5. Minimize or prevent unnatural causes of burrowing owl population declines (e.g., nest burrow destruction, chemical control of rodent hosts and prey).
6. Augment/restore natural dynamics of burrowing owl populations including movement and genetic exchange among populations, such that the species does not require future listing and protection under the California Endangered Species Act (CESA) and/or the federal Endangered Species Act (ESA).
7. Engage stakeholders, including ranchers; farmers; military; tribes; local, state, and federal agencies; non-governmental organizations; and scientific research and education communities involved in burrowing owl protection and habitat management.

ACTIVITIES WITH THE POTENTIAL TO TAKE OR IMPACT BURROWING OWLS

The following activities are examples of activities that have the potential to take burrowing owls, their nests or eggs, or destroy or degrade burrowing owl habitat: grading, disking, cultivation, earthmoving, burrow blockage, heavy equipment compacting and crushing burrow tunnels, levee maintenance, flooding, burning and mowing (if burrows are impacted), and operating wind turbine collisions (collectively hereafter referred to as "projects" or "activities"

whether carried out pursuant to CEQA or not). In addition, the following activities may have impacts to burrowing owl populations: eradication of host burrowers; changes in vegetation management (i.e. grazing); use of pesticides and rodenticides; destruction, conversion or degradation of nesting, foraging, over-wintering or other habitats; destruction of natural burrows and burrow surrogates; and disturbance which may result in harassment of owls at occupied burrows.

PROJECT IMPACT EVALUATIONS

The following three progressive steps are effective in evaluating whether projects will result in impacts to burrowing owls. The information gained from these steps will inform any subsequent avoidance, minimization and mitigation measures. The steps for project impact evaluations are: 1) habitat assessment, 2) surveys, and 3) impact assessment. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project. These three site evaluation steps are discussed in detail below.

Biologist Qualifications

The current scientific literature indicates that only individuals meeting the following minimum qualifications should perform burrowing owl habitat assessments, surveys, and impact assessments:

1. Familiarity with the species and its local ecology;
2. Experience conducting habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor;
3. Familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation;
4. Experience with analyzing impacts of development on burrowing owls and their habitat.

Habitat Assessment Data Collection and Reporting

A habitat assessment is the first step in the evaluation process and will assist investigators in determining whether or not occupancy surveys are needed. Refer to Appendix B for a definition of burrowing owl habitat. Compile the detailed information described in Appendix C when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report.

Surveys

Burrowing owl surveys are the second step of the evaluation process and the best available scientific literature recommends that they be conducted whenever burrowing owl habitat or sign (see Appendix B) is encountered on or adjacent to (within 150 meters) a project site

(Thomsen 1971, Martin 1973). Occupancy of burrowing owl habitat is confirmed at a site when at least one burrowing owl, or its sign at or near a burrow entrance, is observed within the last three years (Rich 1984). Burrowing owls are more detectable during the breeding season with detection probabilities being highest during the nestling stage (Conway et al. 2008). In California, the burrowing owl breeding season extends from 1 February to 31 August (Haug et al. 1993, Thompsen 1971) with some variances by geographic location and climatic conditions. Several researchers suggest three or more survey visits during daylight hours (Haug and Diduik 1993, CBOC 1997, Conway and Simon 2003) and recommend each visit occur at least three weeks apart during the peak of the breeding season, commonly accepted in California as between 15 April and 15 July (CBOC 1997). Conway and Simon (2003) and Conway et al. (2008) recommended conducting surveys during the day when most burrowing owls in a local area are in the laying and incubation period (so as not to miss early breeding attempts), during the nesting period, and in the late nestling period when most owls are spending time above ground.

Non-breeding season (1 September to 31 January) surveys may provide information on burrowing owl occupancy, but do not substitute for breeding season surveys because results are typically inconclusive. Burrowing owls are more difficult to detect during the non-breeding season and their seasonal residency status is difficult to ascertain. Burrowing owls detected during non-breeding season surveys may be year-round residents, young from the previous breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, transients or new colonizers. In addition, the numbers of owls and their pattern of distribution may differ during winter and breeding seasons. However, on rare occasions, non-breeding season surveys may be warranted (i.e., if the site is believed to be a wintering site only based on negative breeding season results). Refer to Appendix D for information on breeding season and non-breeding season survey methodologies.

Survey Reports

Adequate information about burrowing owls present in and adjacent to an area that will be disturbed by a project or activity will enable the Department, reviewing agencies and the public to effectively assess potential impacts and will guide the development of avoidance, minimization, and mitigation measures. The survey report includes but is not limited to a description of the proposed project or proposed activity, including the proposed project start and end dates, as well as a description of disturbances or other activities occurring on-site or nearby. Refer to Appendix D for details included in a survey report.

Impact Assessment

The third step in the evaluation process is the impact assessment. When surveys confirm occupied burrowing owl habitat in or adjoining the project area, there are a number of ways to assess a project's potential significant impacts to burrowing owls and their habitat. Richardson and Miller (1997) recommended monitoring raptor behavior prior to developing management recommendations and buffers to determine the extent to which individuals have been sensitized to human disturbance. Monitoring results will also provide detail necessary for developing site-specific measures. Postovit and Postovit (1987) recommended an analytical approach to mitigation planning: define the problem (impact), set goals (to guide mitigation development), evaluate and select mitigation methods, and monitor the results.

Define the problem. The impact assessment evaluates all factors that could affect burrowing owls. Postovit and Postovit (1987) recommend evaluating the following in assessing impacts to raptors and planning mitigation: type and extent of disturbance, duration and timing of disturbance, visibility of disturbance, sensitivity and ability to habituate, and influence of environmental factors. They suggest identifying and addressing all potential direct and indirect impacts to burrowing owls, regardless of whether or not the impacts will occur during the breeding season. Several examples are given for each impact category below; however, examples are not intended to be used exclusively.

Type and extent of the disturbance. The impact assessment describes the nature (source) and extent (scale) of potential project impacts on occupied, satellite and unoccupied burrows including acreage to be lost (temporary or permanent), fragmentation/edge being created, increased distance to other nesting and foraging habitat, and habitat degradation. Discuss any project activities that impact either breeding and/or non-breeding habitat which could affect owl home range size and spatial configuration, negatively affect onsite and offsite burrowing owl presence, increase energetic costs, lower reproductive success, increase vulnerability to predation, and/or decrease the chance of procuring a mate.

Duration and timing of the impact. The impact assessment describes the amount of time the burrowing owl habitat will be unavailable to burrowing owls (temporary or permanent) on the site and the effect of that loss on essential behaviors or life history requirements of burrowing owls, the overlap of project activities with breeding and/or non-breeding seasons (timing of nesting and/or non-breeding activities may vary with latitude and climatic conditions, which should be considered with the timeline of the project or activity), and any variance of the project activities in intensity, scale and proximity relative to burrowing owl occurrences.

Visibility and sensitivity. Some individual burrowing owls or pairs are more sensitive than others to specific stimuli and may habituate to ongoing visual or audible disturbance. Site-specific monitoring may provide clues to the burrowing owl's sensitivities. This type of assessment addresses the sensitivity of burrowing owls within their nesting area to humans on foot, and vehicular traffic. Other variables are whether the site is primarily in a rural versus urban setting, and whether any prior disturbance (e.g., human development or recreation) is known at the site.

Environmental factors. The impact assessment discusses any environmental factors that could be influenced or changed by the proposed activities including nest site availability, predators, prey availability, burrowing mammal presence and abundance, and threats from other extrinsic factors such as human disturbance, urban interface, feral animals, invasive species, disease or pesticides.

Significance of impacts. The impact assessment evaluates the potential loss of nesting burrows, satellite burrows, foraging habitat, dispersal and migration habitat, wintering habitat, and habitat linkages, including habitat supporting prey and host burrowers and other essential habitat attributes. This assessment determines if impacts to the species will result in significant impacts to the species locally, regionally and range-wide per CEQA Guidelines §15382 and Appendix G. The significance of the impact to habitat depends on the extent of habitat disturbed and length of time the habitat is unavailable (for example: minor – several days, medium – several weeks to months, high - breeding season affecting juvenile survival,

or over winter affecting adult survival).

Cumulative effects. The cumulative effects assessment evaluates two consequences: 1) the project's proportional share of reasonably foreseeable impacts on burrowing owls and habitat caused by the project or in combination with other projects and local influences having impacts on burrowing owls and habitat, and 2) the effects on the regional owl population resulting from the project's impacts to burrowing owls and habitat.

Mitigation goals. Establishing goals will assist in planning mitigation and selecting measures that function at a desired level. Goals also provide a standard by which to measure mitigation success. Unless specifically provided for through other FGC Sections or through specific regulations, take, possession or destruction of individual burrowing owls, their nests and eggs is prohibited under FGC sections 3503, 3503.5 and 3513. Therefore, a required goal for all project activities is to avoid take of burrowing owls. Under CEQA, goals would consist of measures that would avoid, minimize and mitigate impacts to a less than significant level. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions. As set forth in more detail in Appendix A, the current scientific literature supports the conclusion that mitigation for permanent habitat loss necessitates replacement with an equivalent or greater habitat area for breeding, foraging, wintering, dispersal, presence of burrows, burrow surrogates, presence of fossorial mammal dens, well drained soils, and abundant and available prey within close proximity to the burrow.

MITIGATION METHODS

The current scientific literature indicates that any site-specific avoidance or mitigation measures developed should incorporate the best practices presented below or other practices confirmed by experts and the Department. The Department is available to assist in the development of site-specific avoidance and mitigation measures.

Avoiding. A primary goal is to design and implement projects to seasonally and spatially avoid negative impacts and disturbances that could result in take of burrowing owls, nests, or eggs. Other avoidance measures may include but not be limited to:

- Avoid disturbing occupied burrows during the nesting period, from 1 February through 31 August.
- Avoid impacting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls.
- Avoid direct destruction of burrows through chaining (dragging a heavy chain over an area to remove shrubs), disking, cultivation, and urban, industrial, or agricultural development.
- Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection.
- Place visible markers near burrows to ensure that farm equipment and other machinery does not collapse burrows.
- Do not fumigate, use treated bait or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting

owls, designated use areas).

- Restrict the use of treated grain to poison mammals to the months of January and February.

Take avoidance (pre-construction) surveys. Take avoidance surveys are intended to detect the presence of burrowing owls on a project site at a fixed period in time and inform necessary take avoidance actions. Take avoidance surveys may detect changes in owl presence such as colonizing owls that have recently moved onto the site, migrating owls, resident burrowing owls changing burrow use, or young of the year that are still present and have not dispersed. Refer to Appendix D for take avoidance survey methodology.

Site surveillance. Burrowing owls may attempt to colonize or re-colonize an area that will be impacted; thus, the current scientific literature indicates a need for ongoing surveillance at the project site during project activities is recommended. The surveillance frequency/effort should be sufficient to detect burrowing owls if they return. Subsequent to their new occupancy or return to the site, take avoidance measures should assure with a high degree of certainty that take of owls will not occur.

Minimizing. If burrowing owls and their habitat can be protected in place on or adjacent to a project site, the use of buffer zones, visual screens or other measures while project activities are occurring can minimize disturbance impacts. Conduct site-specific monitoring to inform development of buffers (see Visibility and sensitivity above). The following general guidelines for implementing buffers should be adjusted to address site-specific conditions using the impact assessment approach described above. The CEQA lead agency and/or project proponent is encouraged to consult with the Department and other burrowing owl experts for assistance in developing site-specific buffer zones and visual screens.

Buffers. Holroyd et al. (2001) identified a need to standardize management and disturbance mitigation guidelines. For instance, guidelines for mitigating impacts by petroleum industries on burrowing owls and other prairie species (Scobie and Faminow, 2000) may be used as a template for future mitigation guidelines (Holroyd et al. 2001). Scobie and Faminow (2000) developed guidelines for activities around occupied burrowing owl nests recommending buffers around low, medium, and high disturbance activities, respectively (see below).

Recommended restricted activity dates and setback distances by level of disturbance for burrowing owls (Scobie and Faminow 2000).

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Based on existing vegetation, human development, and land uses in an area, resource managers may decide to allow human development or resource extraction closer to these area/sites than recommended above. However, if it is decided to allow activities closer than

the setback distances recommended, a broad-scale, long-term, scientifically-rigorous monitoring program ensures that burrowing owls are not detrimentally affected by alternative approaches.

Other minimization measures include eliminating actions that reduce burrowing owl forage and burrowing surrogates (e.g. ground squirrel), or introduce/facilitate burrowing owl predators. Actions that could influence these factors include reducing livestock grazing rates and/or changing the timing or duration of grazing or vegetation management that could result in less suitable habitat.

Burrow exclusion and closure. Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls, or permanently exclude burrowing owls and close burrows after verifying burrows are empty by site monitoring and scoping. Exclusion in and of itself is not a take avoidance, minimization or mitigation method. Eviction of burrowing owls is a potentially significant impact under CEQA.

The long-term demographic consequences of these techniques have not been thoroughly evaluated, and the fate of evicted or excluded burrowing owls has not been systematically studied. Because burrowing owls are dependent on burrows at all times of the year for survival and/or reproduction, evicting them from nesting, roosting, and satellite burrows may lead to indirect impacts or take. Temporary or permanent closure of burrows may result in significant loss of burrows and habitat for reproduction and other life history requirements. Depending on the proximity and availability of alternate habitat, loss of access to burrows will likely result in varying levels of increased stress on burrowing owls and could depress reproduction, increase predation, increase energetic costs, and introduce risks posed by having to find and compete for available burrows. Therefore, exclusion and burrow closure are not recommended where they can be avoided. The current scientific literature indicates consideration of all possible avoidance and minimization measures before temporary or permanent exclusion and closure of burrows is implemented, in order to avoid take.

The results of a study by Trulio (1995) in California showed that burrowing owls passively displaced from their burrows were quickly attracted to adjacent artificial burrows at five of six passive relocation sites. The successful sites were all within 75 meters (m) of the destroyed burrow, a distance generally within a pair's territory. This researcher discouraged using passive relocation to artificial burrows as a mitigation measure for lost burrows without protection of adjacent foraging habitat. The study results indicated artificial burrows were used by evicted burrowing owls when they were approximately 50-100 m from the natural burrow (Thomsen 1971, Haug and Oliphant 1990). Locating artificial or natural burrows more than 100 m from the eviction burrow may greatly reduce the chances that new burrows will be used. Ideally, exclusion and burrow closure is employed only where there are adjacent natural burrows and non-impacted, sufficient habitat for burrowing owls to occupy with permanent protection mechanisms in place. Any new burrowing owl colonizing the project site after the CEQA document has been adopted may constitute changed circumstances that should be addressed in a re-circulated CEQA document.

The current scientific literature indicates that burrow exclusion should only be conducted by qualified biologists (meeting the Biologist's Qualifications above) during the non-breeding

season, before breeding behavior is exhibited and after the burrow is confirmed empty by site surveillance and/or scoping. The literature also indicates that when temporary or permanent burrow exclusion and/or burrow closure is implemented, burrowing owls should not be excluded from burrows unless or until:

- A Burrowing Owl Exclusion Plan (see Appendix E) is developed and approved by the applicable local DFG office;
- Permanent loss of occupied burrow(s) and habitat is mitigated in accordance with the Mitigating Impacts sections below. Temporary exclusion is mitigated in accordance with the item #1 under Mitigating Impacts below.
- Site monitoring is conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Conduct daily monitoring for one week to confirm young of the year have fledged if the exclusion will occur immediately after the end of the breeding season.
- Excluded burrowing owls are documented using artificial or natural burrows on an adjoining mitigation site (if able to confirm by band re-sight).

Translocation (Active relocation offsite >100 meters). At this time, there is little published information regarding the efficacy of translocating burrowing owls, and additional research is needed to determine subsequent survival and breeding success (Klute et al. 2003, Holroyd et al. 2001). Study results for translocation in Florida implied that hatching success may be decreased for populations of burrowing owls that undergo translocation (Nixon 2006). At this time, the Department is unable to authorize the capture and relocation of burrowing owls except within the context of scientific research (FGC §1002) or a NCCP conservation strategy.

Mitigating impacts. Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali, 2008). At a minimum, if burrowing owls have been documented to occupy burrows (see Definitions, Appendix B) at the project site in recent years, the current scientific literature supports the conclusion that the site should be considered occupied and mitigation should be required by the CEQA lead agency to address project-specific significant and cumulative impacts. Other site-specific and regionally significant and cumulative impacts may warrant mitigation. The current scientific literature indicates the following to be best practices. If these best practices cannot be implemented, the lead agency or lead investigator may consult with the Department to develop effective mitigation alternatives. The Department is also available to assist in the identification of suitable mitigation lands.

1. Where habitat will be temporarily disturbed, restore the disturbed area to pre-project condition including decompacting soil and revegetating. Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable depending on the time frame, resulting in reduced survival or abandonment. For the latter potential impact, see the permanent impact measures below.
2. Mitigate for permanent impacts to nesting, occupied and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of burrows and burrowing owls impacted are replaced based on the information provided in Appendix A. Note: A

minimum habitat replacement recommendation is not provided here as it has been shown to serve as a default, replacing any site-specific analysis and discounting the wide variation in natal area, home range, foraging area, and other factors influencing burrowing owls and burrowing owl population persistence in a particular area.

3. Mitigate for permanent impacts to nesting, occupied and satellite burrows and burrowing owl habitat with (a) permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal (i.e., during breeding and non-breeding seasons) comparable to or better than that of the impact area, and (b) sufficiently large acreage, and presence of fossorial mammals. The mitigation lands may require habitat enhancements including enhancement or expansion of burrows for breeding, shelter and dispersal opportunity, and removal or control of population stressors. If the mitigation lands are located adjacent to the impacted burrow site, ensure the nearest neighbor artificial or natural burrow clusters are at least within 210 meters (Fisher et al. 2007).
4. Permanently protect mitigation land through a conservation easement deeded to a non-profit conservation organization or public agency with a conservation mission, for the purpose of conserving burrowing owl habitat and prohibiting activities incompatible with burrowing owl use. If the project is located within the service area of a Department-approved burrowing owl conservation bank, the project proponent may purchase available burrowing owl conservation bank credits.
5. Develop and implement a mitigation land management plan to address long-term ecological sustainability and maintenance of the site for burrowing owls (see Management Plan and Artificial Burrow sections below, if applicable).
6. Fund the maintenance and management of mitigation land through the establishment of a long-term funding mechanism such as an endowment.
7. Habitat should not be altered or destroyed, and burrowing owls should not be excluded from burrows, until mitigation lands have been legally secured, are managed for the benefit of burrowing owls according to Department-approved management, monitoring and reporting plans, and the endowment or other long-term funding mechanism is in place or security is provided until these measures are completed.
8. Mitigation lands should be on, adjacent or proximate to the impact site where possible and where habitat is sufficient to support burrowing owls present.
9. Where there is insufficient habitat on, adjacent to, or near project sites where burrowing owls will be excluded, acquire mitigation lands with burrowing owl habitat away from the project site. The selection of mitigation lands should then focus on consolidating and enlarging conservation areas located outside of urban and planned growth areas, within foraging distance of other conserved lands. If mitigation lands are not available adjacent to other conserved lands, increase the mitigation land acreage requirement to ensure a selected site is of sufficient size. Offsite mitigation may not adequately offset the biological and habitat values impacted on a one to one basis. Consult with the Department when determining offsite mitigation acreages.
10. Evaluate and select suitable mitigation lands based on a comparison of the habitat attributes of the impacted and conserved lands, including but not limited to: type and structure of habitat being impacted or conserved; density of burrowing owls in impacted and conserved habitat; and significance of impacted or conserved habitat to the species range-wide. Mitigate for the highest quality burrowing owl habitat impacted first and foremost when identifying mitigation lands, even if a mitigation site is located outside of

a lead agency's jurisdictional boundary, particularly if the lead agency is a city or special district.

11. Select mitigation lands taking into account the potential human and wildlife conflicts or incompatibility, including but not limited to, human foot and vehicle traffic, and predation by cats, loose dogs and urban-adapted wildlife, and incompatible species management (i.e., snowy plover).
12. Where a burrowing owl population appears to be highly adapted to heavily altered habitats such as golf courses, airports, athletic fields, and business complexes, permanently protecting the land, augmenting the site with artificial burrows, and enhancing and maintaining those areas may enhance sustainability of the burrowing owl population onsite. Maintenance includes keeping lands grazed or mowed with weed-eaters or push mowers, free from trees and shrubs, and preventing excessive human and human-related disturbance (e.g., walking, jogging, off-road activity, dog-walking) and loose and feral pets (chasing and, presumably, preying upon owls) that make the environment uninhabitable for burrowing owls (Wesemann and Rowe 1985, Millsap and Bear 2000, Lincer and Bloom 2007). Items 4, 5 and 6 also still apply to this mitigation approach.
13. If there are no other feasible mitigation options available and a lead agency is willing to establish and oversee a Burrowing Owl Mitigation and Conservation Fund that funds on a competitive basis acquisition and permanent habitat conservation, the project proponent may participate in the lead agency's program.

Artificial burrows. Artificial burrows have been used to replace natural burrows either temporarily or long-term and their long-term success is unclear. Artificial burrows may be an effective addition to in-perpetuity habitat mitigation if they are augmenting natural burrows, the burrows are regularly maintained (i.e., no less than annual, with biennial maintenance recommended), and surrounding habitat patches are carefully maintained. There may be some circumstances, for example at airports, where squirrels will not be allowed to persist and create a dynamic burrow system, where artificial burrows may provide some support to an owl population.

Many variables may contribute to the successful use of artificial burrows by burrowing owls, including pre-existence of burrowing owls in the area, availability of food, predators, surrounding vegetation and proximity, number of natural burrows in proximity, type of materials used to build the burrow, size of the burrow and entrance, direction in which the burrow entrance is facing, slope of the entrance, number of burrow entrances per burrow, depth of the burrow, type and height of perches, and annual maintenance needs (Belthoff and King 2002, Smith et al. 2005, Barclay et al. 2011). Refer to Barclay (2008) and (2011) and to Johnson et al. 2010 (unpublished report) for guidance on installing artificial burrows including recommendations for placement, installation and maintenance.

Any long-term reliance on artificial burrows as natural burrow replacements must include semi-annual to annual cleaning and maintenance and/or replacement (Barclay et al. 2011, Smith and Conway 2005, Alexander et al. 2005) as an ongoing management practice. Alexander et al. (2005), in a study of the use of artificial burrows found that all of 20 artificial burrows needed some annual cleaning and maintenance. Burrows were either excavated by predators, blocked by soil or vegetation, or experienced substrate erosion forming a space beneath the tubing that prevented nestlings from re-entering the burrow.

Mitigation lands management plan. Develop a Mitigation Lands Management Plan for projects that require off-site or on-site mitigation habitat protection to ensure compliance with and effectiveness of identified management actions for the mitigation lands. A suggested outline and related vegetation management goals and monitoring success criteria can be found in Appendix E.

Mitigation Monitoring and Reporting

Verify the compliance with required mitigation measures, the accuracy of predictions, and ensure the effectiveness of all mitigation measures for burrowing owls by conducting follow-up monitoring, and implementing midcourse corrections, if necessary, to protect burrowing owls. Refer to CEQA Guidelines Section 15097 and the CEQA Guidelines for additional guidance on mitigation, monitoring and reporting. Monitoring is qualitatively different from site surveillance; monitoring normally has a specific purpose and its outputs and outcomes will usually allow a comparison with some baseline condition of the site before the mitigation (including avoidance and minimization) was undertaken. Ideally, monitoring should be based on the Before-After Control-Impact (BACI) principle (McDonald et al. 2000) that requires knowledge of the pre-mitigation state to provide a reference point for the state and change in state after the project and mitigation have been implemented.

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Appendix A. Burrowing Owl Natural History and Threats

Diet

Burrowing owl diet includes arthropods, small rodents, birds, amphibians, reptiles, and carrion (Haug et al. 1993).

Breeding

In California, the breeding season for the burrowing owl typically occurs between 1 February and 31 August although breeding in December has been documented (Thompson 1971, Gervais et al. 2008); breeding behavior includes nest site selection by the male, pair formation, copulation, egg laying, hatching, fledging, and post-fledging care of young by the parents. The peak of the breeding season occurs between 15 April and 15 July and is the period when most burrowing owls have active nests (eggs or young). The incubation period lasts 29 days (Coulombe 1971) and young fledge after 44 days (Haug et al. 1993). Note that the timing of nesting activities may vary with latitude and climatic conditions. Burrowing owls may change burrows several times during the breeding season, starting when nestlings are about three weeks old (Haug et al. 1993).

Dispersal

The following discussion is an excerpt from Gervais et al (2008):

> "The burrowing owl is often considered a sedentary species (e.g., Thomsen 1971). A large proportion of adults show strong fidelity to their nest site from year to year, especially where resident, as in Florida (74% for females, 83% for males; Millsap and Bear 1997). In California, nest-site fidelity rates were 32%–50% in a large grassland and 57% in an agricultural environment (Ronan 2002, Catlin 2004, Catlin et al. 2005). Differences in these rates among sites may reflect differences in nest predation rates (Catlin 2004, Catlin et al. 2005). Despite the high nest fidelity rates, dispersal distances may be considerable for both juveniles (natal dispersal) and adults (postbreeding dispersal), but this also varied with location (Catlin 2004, Rosier et al. 2006). Distances of 53 km to roughly 150 km have been observed in California for adult and natal dispersal, respectively (D. K. Rosenberg and J. A. Gervais, unpublished data), despite the difficulty in detecting movements beyond the immediate study area (Koenig et al. 1996)."

Habitat

The burrowing owl is a small, long-legged, ground-dwelling bird species, well-adapted to open, relatively flat expanses. In California, preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography and well-drained soils (Haug et al. 1993). Grassland, shrub steppe, and desert are naturally occurring habitat types used by the species. In addition, burrowing owls may occur in some agricultural areas, ruderal grassy fields, vacant lots and pastures if the vegetation structure is suitable and there are useable burrows and foraging habitat in proximity (Gervais et al 2008). Unique amongst North

American raptors, the burrowing owl requires underground burrows or other cavities for nesting during the breeding season and for roosting and cover, year round. Burrows used by the owls are usually dug by other species termed host burrowers. In California, California ground squirrel (*Spermophilus beecheyi*) and round-tailed ground squirrel (*Citellus tereticaudus*) burrows are frequently used by burrowing owls but they may use dens or holes dug by other fossorial species including badger (*Taxidea taxus*), coyote (*Canis latrans*), and fox (e.g., San Joaquin kit fox, *Vulpes macrotis mutica*; Ronan 2002). In some instances, owls have been known to excavate their own burrows (Thompson 1971, Barclay 2007). Natural rock cavities, debris piles, culverts, and pipes also are used for nesting and roosting (Rosenberg et al. 1998). Burrowing owls have been documented using artificial burrows for nesting and cover (Smith and Belthoff, 2003).

Foraging habitat. Foraging habitat is essential to burrowing owls. The following discussion is an excerpt from Gervais et al. (2008):

> "Useful as a rough guide to evaluating project impacts and appropriate mitigation for burrowing owls, adult male burrowing owls home ranges have been documented (calculated by minimum convex polygon) to comprise anywhere from 280 acres in intensively irrigated agroecosystems in Imperial Valley (Rosenberg and Haley 2004) to 450 acres in mixed agricultural lands at Lemoore Naval Air Station, CA (Gervais et al. 2003), to 600 acres in pasture in Saskatchewan, Canada (Haug and Oliphant 1990). But owl home ranges may be much larger, perhaps by an order of magnitude, in non-irrigated grasslands such as at Carrizo Plain, California (Gervais et al. 2008), based on telemetry studies and distribution of nests. Foraging occurs primarily within 600 m of their nests (within approximately 300 acres, based on a circle with a 600 m radius) during the breeding season."

Importance of burrows and adjacent habitat. Burrows and the associated surrounding habitat are essential ecological requisites for burrowing owls throughout the year and especially during the breeding season. During the non-breeding season, burrowing owls remain closely associated with burrows, as they continue to use them as refuge from predators, shelter from weather and roost sites. Resident populations will remain near the previous season's nest burrow at least some of the time (Coulombe 1971, Thomsen 1971, Botelho 1996, LaFever et al. 2008).

In a study by Lutz and Plumpton (1999) adult males and females nested in formerly used sites at similar rates (75% and 63%, respectively) (Lutz and Plumpton 1999). Burrow fidelity has been reported in some areas; however, more frequently, burrowing owls reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Burrow and nest sites are re-used at a higher rate if the burrowing owl has reproduced successfully during the previous year (Haug et al. 1993) and if the number of burrows isn't limiting nesting opportunity.

Burrowing owls may use "satellite" or non-nesting burrows, moving young at 10-14 days, presumably to reduce risk of predation (Desmond and Savidge 1998) and possibly to avoid nest parasites (Dechant et al. 1999). Successful nests in Nebraska had more active satellite burrows within 75 m of the nest burrow than unsuccessful nests (Desmond and Savidge

1999). Several studies have documented the number of satellite burrows used by young and adult burrowing owls during the breeding season as between one and 11 burrows with an average use of approximately five burrows (Thompsen 1984, Haug 1985, Haug and Oliphant 1990). Supporting the notion of selecting for nest sites near potential satellite burrows, Ronan (2002) found burrowing owl families would move away from a nest site if their satellite burrows were experimentally removed through blocking their entrance.

Habitat adjacent to burrows has been documented to be important to burrowing owls. Gervais et al. (2003) found that home range sizes of male burrowing owls during the nesting season were highly variable within but not between years. Their results also suggested that owls concentrate foraging efforts within 600 meters of the nest burrow, as was observed in Canada (Haug and Oliphant 1990) and southern California (Rosenberg and Haley 2004). James et al. (1997), reported habitat modification factors causing local burrowing owl declines included habitat fragmentation and loss of connectivity.

In conclusion, the best available science indicates that essential habitat for the burrowing owl in California must include suitable year-round habitat, primarily for breeding, foraging, wintering and dispersal habitat consisting of short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey within close proximity to the burrow.

Threats to Burrowing Owls in California

Habitat loss. Habitat loss, degradation, and fragmentation are the greatest threats to burrowing owls in California. According to DeSante et al. (2007), "the vast majority of burrowing owls [now] occur in the wide, flat lowland valleys and basins of the Imperial Valley and Great Central Valley [where] for the most part,...the highest rates of residential and commercial development in California are occurring." Habitat loss from the State's long history of urbanization in coastal counties has already resulted in either extirpation or drastic reduction of burrowing owl populations there (Gervais et al. 2008). Further, loss of agricultural and other open lands (such as grazed landscapes) also negatively affect owl populations. Because of their need for open habitat with low vegetation, burrowing owls are unlikely to persist in agricultural lands dominated by vineyards and orchards (Gervais et al. 2008).

Control of burrowing rodents. According to Klute et al. (2003), the elimination of burrowing rodents through control programs is a primary factor in the recent and historical decline of burrowing owl populations nationwide. In California, ground squirrel burrows are most often used by burrowing owls for nesting and cover; thus, ground squirrel control programs may affect owl numbers in local areas by eliminating a necessary resource.

Direct mortality. Burrowing owls suffer direct losses from a number of sources. Vehicle collisions are a significant source of mortality especially in the urban interface and where owls nest alongside roads (Haug et al. 1993, Gervais et al. 2008). Road and ditch maintenance, modification of water conveyance structures (Imperial Valley) and discing to control weeds in fallow fields may destroy burrows (Rosenberg and Haley 2004, Catlin and Rosenberg 2006) which may trap or crush owls. Wind turbines at Altamont Pass Wind Resource Area are known to cause direct burrowing owl mortality (Thelander et al. 2003). Exposure to

pesticides may pose a threat to the species but is poorly understood (Klute et al. 2003, Gervais et al. 2008).

Appendix B. Definitions

Some key terms that appear in this document are defined below.

Adjacent habitat means burrowing owl habitat that abuts the area where habitat and burrows will be impacted and rendered non-suitable for occupancy.

Breeding (nesting) season begins as early as 1 February and continues through 31 August (Thomsen 1971, Zarn 1974). The timing of breeding activities may vary with latitude and climatic conditions. The breeding season includes pairing, egg-laying and incubation, and nestling and fledging stages.

Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls or permanently exclude burrowing owls and excavate and close burrows after confirming burrows are empty.

Burrowing owl habitat generally includes, but is not limited to, short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey.

Burrow surrogates include culverts, piles of concrete rubble, piles of soil, burrows created along soft banks of ditches and canals, pipes, and similar structures.

Civil twilight - Morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon (civil dawn) and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun reaches 6 degrees below the horizon (civil dusk). During this period there is enough light from the sun that artificial sources of light may not be needed to carry on outdoor activities. This concept is sometimes enshrined in laws, for example, when drivers of automobiles must turn on their headlights (called lighting-up time in the UK); when pilots may exercise the rights to fly aircraft. Civil twilight can also be described as the limit at which twilight illumination is sufficient, under clear weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under clear atmospheric conditions.

Conservation for burrowing owls may include but may not be limited to protecting remaining breeding pairs or providing for population expansion, protecting and enhancing breeding and essential habitat, and amending or augmenting land use plans to stabilize populations and other specific actions to avoid the need to list the species pursuant to California or federal Endangered Species Acts.

Contiguous means connected together so as to form an uninterrupted expanse in space.

Essential habitat includes nesting, foraging, wintering, and dispersal habitat.

Foraging habitat is habitat within the estimated home range of an occupied burrow, supports suitable prey base, and allows for effective hunting.

Host burrowers include ground squirrels, badgers, foxes, coyotes, gophers etc.

Locally significant species is a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or occurring in a unique habitat type.

Non-breeding season is the period of time when nesting activity is not occurring, generally September 1 through January 31, but may vary with latitude and climatic conditions.

Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years (Rich 1984). Occupancy of suitable burrowing owl habitat may also be indicated by owl sign including its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance or perch site.

Other impacting activities may include but may not be limited to agricultural practices, vegetation management and fire control, pest management, conversion of habitat from rangeland or natural lands to more intensive agricultural uses that could result in "take". These impacting activities may not meet the definition of a project under CEQA.

Passive relocation is a technique of installing one-way doors in burrow openings to temporarily or permanently evict burrowing owls and prevent burrow re-occupation.

Peak of the breeding season is between 15 April and 15 July.

Sign includes its tracks, molted feathers, cast pellets (defined as 1-2" long brown to black regurgitated pellets consisting of non-digestible portions of the owls' diet, such as fur, bones, claws, beetle elytra, or feathers), prey remains, egg shell fragments, owl white wash, nest burrow decoration materials (e.g., paper, foil, plastic items, livestock or other animal manure, etc.), possible owl perches, or other items.

Appendix C. Habitat Assessment and Reporting Details

Habitat Assessment Data Collection and Reporting

Current scientific literature indicates that it would be most effective to gather the data in the manner described below when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report:

1. Conduct at least one visit covering the entire potential project/activity area including areas that will be directly or indirectly impacted by the project. Survey adjoining areas within 150 m (Thomsen 1971, Martin 1973), or more where direct or indirect effects could potentially extend offsite. If lawful access cannot be achieved to adjacent areas, surveys can be performed with a spotting scope or other methods.
2. Prior to the site visit, compile relevant biological information for the site and surrounding area to provide a local and regional context.
3. Check all available sources for burrowing owl occurrence information regionally prior to a field inspection. The CNDDB and BIOS (see References cited) may be consulted for known occurrences of burrowing owls. Other sources of information include, but are not limited to, the Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007), county bird atlas projects, Breeding Bird Survey records, eBIRD (http://ebird.org), Gervais et al. (2008), local reports or experts, museum records, and other site-specific relevant information.
4. Identify vegetation and habitat types potentially supporting burrowing owls in the project area and vicinity.
5. Record and report on the following information:
   a. A full description of the proposed project, including but not limited to, expected work periods, daily work schedules, equipment used, activities performed (such as drilling, construction, excavation, etc.) and whether the expected activities will vary in location or intensity over the project's timeline;
   b. A regional setting map, showing the general project location relative to major roads and other recognizable features;
   c. A detailed map (preferably a USGS topo 7.5' quad base map) of the site and proposed project, including the footprint of proposed land and/or vegetation-altering activities, base map source, identifying topography, landscape features, a north arrow, bar scale, and legend;
   d. A written description of the biological setting, including location (Section, Township, Range, baseline and meridian), acreage, topography, soils, geographic and hydrologic characteristics, land use and management history on and adjoining the site (i.e., whether it is urban, semi-urban or rural; whether there is any evidence of past or current livestock grazing, mowing, disking, or other vegetation management activities);
   e. An analysis of any relevant, historical information concerning burrowing owl use or occupancy (breeding, foraging, over-wintering) on site or in the assessment area;
   f. Vegetation type and structure (using Sawyer et al. 2009), vegetation height, habitat types and features in the surrounding area plus a reasonably sized (as supported with logical justification) assessment area; (Note: use caution in discounting habitat based on grass height as it can be a temporary condition variable by season and conditions (such as current grazing regime) or may be distributed as a mosaic).

g. The presence of burrowing owl individuals or pairs or sign (see Appendix B);
h. The presence of suitable burrows and/or burrow surrogates (>11 cm in diameter (height and width) and >150 cm in depth) (Johnson et al. 2010), regardless of a lack of any burrowing owl sign and/or burrow surrogates; and burrowing owls and/or their sign that have recently or historically (within the last 3 years) been identified on or adjacent to the site.

Appendix D. Breeding and Non-breeding Season Surveys and Reports

Current scientific literature indicates that it is most effective to conduct breeding and non-breeding season surveys and report in the manner that follows:

Breeding Season Surveys

Number of visits and timing. Conduct 4 survey visits: 1) at least one site visit between 15 February and 15 April, and 2) a minimum of three survey visits, at least three weeks apart, between 15 April and 15 July, with at least one visit after 15 June. Note: many burrowing owl migrants are still present in southwestern California during mid-March, therefore, exercise caution in assuming breeding occupancy early in the breeding season.

Survey method. Rosenberg et al. (2007) confirmed walking line transects were most effective in smaller habitat patches. Conduct surveys in all portions of the project site that were identified in the Habitat Assessment and fit the description of habitat in Appendix A. Conduct surveys by walking straight-line transects spaced 7 m to 20 m apart, adjusting for vegetation height and density (Rosenberg et al. 2007). At the start of each transect and, at least, every 100 m, scan the entire visible project area for burrowing owls using binoculars. During walking surveys, record all potential burrows used by burrowing owls as determined by the presence of one or more burrowing owls, pellets, prey remains, whitewash, or decoration. Some burrowing owls may be detected by their calls, so observers should also listen for burrowing owls while conducting the survey.

Care should be taken to minimize disturbance near occupied burrows during all seasons and not to "flush" burrowing owls especially if predators are present to reduce any potential for needless energy expenditure or burrowing owl mortality. Burrowing owls may flush if approached by pedestrians within 50 m (Conway et al. 2003). If raptors or other predators are present that may suppress burrowing owl activity, return at another time or later date for a follow-up survey.

Check all burrowing owls detected for bands and/or color bands and report band combinations to the Bird Banding Laboratory (BBL). Some site-specific variations to survey methods discussed below may be developed in coordination with species experts and Department staff.

Weather conditions. Poor weather may affect the surveyor's ability to detect burrowing owls, therefore, avoid conducting surveys when wind speed is >20 km/hr, and there is precipitation or dense fog. Surveys have greater detection probability if conducted when ambient temperatures are >20° C, <12 km/hr winds, and cloud cover is <75% (Conway et al. 2008).

Time of day. Daily timing of surveys varies according to the literature, latitude, and survey method. However, surveys between morning civil twilight and 10:00 AM and two hours before sunset until evening civil twilight provide the highest detection probabilities (Barclay pers. comm. 2012, Conway et al. 2008).

Alternate methods. If the project site is large enough to warrant an alternate method, consult current literature for generally accepted survey methods and consult with the Department on the proposed survey approach.

Additional breeding season site visits. Additional breeding season site visits may be necessary, especially if non-breeding season exclusion methods are contemplated. Detailed information, such as approximate home ranges of each individual or of family units, as well as foraging areas as related to the proposed project, will be important to document for evaluating impacts, planning avoidance measure implementation and for mitigation measure performance monitoring.

Adverse conditions may prevent investigators from determining presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owls in any given year. Any such conditions should be identified and discussed in the survey report. Visits to the site in more than one year may increase the likelihood of detection. Also, visits to adjacent known occupied habitat may help determine appropriate survey timing.

Given the high site fidelity shown by burrowing owls (see Appendix A, Importance of burrows), conducting surveys over several years may be necessary when project activities are ongoing, occur annually, or start and stop seasonally. (See Negative surveys).

Non-breeding Season Surveys

If conducting non-breeding season surveys, follow the methods described above for breeding season surveys, but conduct at least four (4) visits, spread evenly, throughout the non-breeding season. Burrowing owl experts and local Department staff are available to assist with interpreting results.

Negative Surveys

Adverse conditions may prevent investigators from documenting presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owl in any given year. Discuss such conditions in the Survey Report. Visits to the site in more than one year increase the likelihood of detection and failure to locate burrowing owls during one field season does not constitute evidence that the site is no longer occupied, particularly if adverse conditions influenced the survey results. Visits to other nearby known occupied sites can affirm whether the survey timing is appropriate.

Take Avoidance Surveys

Field experience from 1995 to present supports the conclusion that it would be effective to complete an initial take avoidance survey no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Detection Surveys section above. Implementation of avoidance and minimization measures would be triggered by positive owl presence on the site where project activities will occur. The development of avoidance and minimization approaches would be informed by monitoring the burrowing owls.

Burrowing owls may re-colonize a site after only a few days. Time lapses between project activities trigger subsequent take avoidance surveys including but not limited to a final survey conducted within 24 hours prior to ground disturbance.

Survey Reports

Report on the survey methods used and results including the information described in the Summary Report and include the reports within the CEQA documentation:

1. Date, start and end time of surveys including weather conditions (ambient temperature, wind speed, percent cloud cover, precipitation and visibility);
2. Name(s) of surveyor(s) and qualifications;
3. A discussion of how the timing of the survey affected the comprehensiveness and detection probability;
4. A description of survey methods used including transect spacing, point count dispersal and duration, and any calls used;
5. A description and justification of the area surveyed relative to the project area;
6. A description that includes: number of owls or nesting pairs at each location (by nestlings, juveniles, adults, and those of an unknown age), number of burrows being used by owls, and burrowing owl sign at burrows. Include a description of individual markers, such as bands (numbers and colors), transmitters, or unique natural identifying features. If any owls are banded, request documentation from the BBL and bander to report on the details regarding the known history of the banded burrowing owl(s) (age, sex, origins, whether it was previously relocated) and provide with the report if available;
7. A description of the behavior of burrowing owls during the surveys, including feeding, resting, courtship, alarm, territorial defense, and those indicative of parents or juveniles;
8. A list of possible burrowing owl predators present and documentation of any evidence of predation of owls;
9. A detailed map (1:24,000 or closer to show details) showing locations of all burrowing owls, potential burrows, occupied burrows, areas of concentrated burrows, and burrowing owl sign. Locations documented by use of global positioning system (GPS) coordinates must include the datum in which they were collected. The map should include a title, north arrow, bar scale and legend;
10. Signed field forms, photos, etc., as appendices to the field survey report;
11. Recent color photographs of the proposed project or activity site; and
12. Original CNDDB Field Survey Forms should be sent directly to the Department's CNDDB office, and copies should be included in the environmental document as an appendix. (http://www.dfg.ca.gov/bdb/html/cnddb.html).

Appendix E. Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans

Whereas the Department does not recommend exclusion and burrow closure, current scientific literature and experience from 1995 to present, indicate that the following example components for burrowing owl artificial burrow and exclusion plans, combined with consultation with the Department to further develop these plans, would be effective.

Artificial Burrow Location

If a burrow is confirmed occupied on-site, artificial burrow locations should be appropriately located and their use should be documented taking into consideration:

1. A brief description of the project and project site pre-construction;
2. The mitigation measures that will be implemented;
3. Potential conflicting site uses or encumbrances;
4. A comparison of the occupied burrow site(s) and the artificial burrow site(s) (e.g., vegetation, habitat types, fossorial species use in the area, and other features);
5. Artificial burrow(s) proximity to the project activities, roads and drainages;
6. Artificial burrow(s) proximity to other burrows and entrance exposure;
7. Photographs of the site of the occupied burrow(s) and the artificial burrows;
8. Map of the project area that identifies the burrow(s) to be excluded as well as the proposed sites for the artificial burrows;
9. A brief description of the artificial burrow design;
10. Description of the monitoring that will take place during and after project implementation including information that will be provided in a monitoring report.
11. A description of the frequency and type of burrow maintenance.

Exclusion Plan

An Exclusion Plan addresses the following including but not limited to:

1. Confirm by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding burrow scoping;
2. Type of scope and appropriate timing of scoping to avoid impacts;
3. Occupancy factors to look for and what will guide determination of vacancy and excavation timing (one-way doors should be left in place 48 hours to ensure burrowing owls have left the burrow before excavation, visited twice daily and monitored for evidence that owls are inside and can't escape i.e., look for sign immediately inside the door).
4. How the burrow(s) will be excavated. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow);
5. Removal of other potential owl burrow surrogates or refugia on site;
6. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

7. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take;
8. How the impacted site will continually be made inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

Appendix F. Mitigation Management Plan and Vegetation Management Goals

Mitigation Management Plan

A mitigation site management plan will help ensure the appropriate implementation and maintenance for the mitigation site and persistence of the burrowing owls on the site. For an example to review, refer to Rosenberg et al. (2009). The current scientific literature and field experience from 1995 to present indicate that an effective management plan includes the following:

1. Mitigation objectives;
2. Site selection factors (including a comparison of the attributes of the impacted and conserved lands) and baseline assessment;
3. Enhancement of the conserved lands (enhancement of reproductive capacity, enhancement of breeding areas and dispersal opportunities, and removal or control of population stressors);
4. Site protection method and prohibited uses;
5. Site manager roles and responsibilities;
6. Habitat management goals and objectives:
   a. Vegetation management goals,
      i. Vegetation management tools:
         1. Grazing
         2. Mowing
         3. Burning
         4. Other
   b. Management of ground squirrels and other fossorial mammals,
   c. Semi-annual and annual artificial burrow cleaning and maintenance,
   d. Non-natives control – weeds and wildlife,
   e. Trash removal;
7. Financial assurances:
   a. Property analysis record or other financial analysis to determine long-term management funding,
   b. Funding schedule;
8. Performance standards and success criteria;
9. Monitoring, surveys and adaptive management;
10. Maps;
11. Annual reports.

Vegetation Management Goals

- Manage vegetation height and density (especially in immediate proximity to burrows). Suitable vegetation structure varies across sites and vegetation types, but should generally be at the average effective vegetation height of 4.7 cm (Green and Anthony 1989) and <13 cm average effective vegetation height (MacCracken et al. 1985*a)*.
- Employ experimental prescribed fires (controlled, at a small scale) to manage vegetation structure;

- Vegetation reduction or ground disturbance timing, extent, and configuration should avoid take. While local ordinances may require fire prevention through vegetation management, activities like disking, mowing, and grading during the breeding season can result in take of burrowing owls and collapse of burrows, causing nest destruction. Consult the take avoidance surveys section above for pre-management avoidance survey recommendations;
- Promote natural prey distribution and abundance, especially in proximity to occupied burrows; and
- Promote self-sustaining populations of host burrowers by limiting or prohibiting lethal rodent control measures and by ensuring food availability for host burrowers through vegetation management.

Refer to Rosenberg et al. (2009) for a good discussion of managing grasslands for burrowing owls.

Mitigation Site Success Criteria

In order to evaluate the success of mitigation and management strategies for burrowing owls, monitoring is required that is specific to the burrowing owl management plan. Given limited resources, Barclay et al. (2011) suggests managers focus on accurately estimating annual adult owl populations rather than devoting time to estimating reproduction, which shows high annual variation and is difficult to accurately estimate. Therefore, the key objective will be to determine accurately the number of adult burrowing owls and pairs, and if the numbers are maintained. A frequency of 5-10 years for surveys to estimate population size may suffice if there are no changes in the management of the nesting and foraging habitat of the owls.

Effective monitoring and evaluation of off-site and on-site mitigation management success for burrowing owls includes (Barclay, pers. comm.):

- Site tenacity;
- Number of adult owls present and reproducing;
- Colonization by burrowing owls from elsewhere (by band re-sight);
- Evidence and causes of mortality;
- Changes in distribution; and
- Trends in stressors.

Exhibit B

State Water Resources Control Board
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I. BACKGROUND

A. History

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that established storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 lowered the permitting threshold from five acres to one acre.

While federal regulations allow two permitting options for storm water discharges (Individual Permits and General Permits), the State Water Board has elected to adopt only one statewide General Permit at this time that will apply to most storm water discharges associated with construction activity.

On August 19, 1999, the State Water Board reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999 the State Water Board amended Order 99-08-DWQ to apply to sites as small as one acre.

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the administrative burden associated with permitting individual storm water discharges. To obtain coverage under this General Permit, dischargers shall electronically file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance related documents required by this General Permit and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Quality Control Boards (Regional Water Boards) may issue General Permits or Individual Permits containing more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers.

B. Legal Challenges and Court Decisions

1. Early Court Decisions

Shortly after the passage of the CWA, the USEPA promulgated regulations exempting most storm water discharges from the NPDES permit requirements. (See 40 C.F.R. § 125.4 (1975); see also *Natural Resources Defense Council v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1372 (*Costle*); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1163 (*Defenders of Wildlife*).) When environmental groups challenged this exemption in federal court, the District of Columbia Court of Appeals invalidated the regulation, holding that the USEPA "does not have authority to exempt categories of point sources from the permit requirements of [CWA] § 402." (*Costle*, 568 F.2d at 1377.) The *Costle* court rejected the USEPA's argument that effluent-based storm sewer regulation was administratively infeasible because of the variable nature of storm water pollution and the number of affected storm sewers throughout the country. (*Id.* at 1377-82.) Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the USEPA had the flexibility under the CWA to design regulations that would overcome these problems. (*Id.* at 1379-83.) In particular, the court pointed to general permits and permits based on requiring best management practices (BMPs).

During the next 15 years, the USEPA made numerous attempts to reconcile the statutory requirement of point source regulation with the practical problem of regulating possibly millions of diverse point source discharges of storm water. (See *Defenders of Wildlife*, 191 F.3d at 1163; see also Gallagher, Clean Water Act in Environmental Law Handbook (Sullivan, edit., 2003)
p. 300 (Environmental Law Handbook); Eisen, *Toward a Sustainable Urbanism: Lessons from Federal Regulation of Urban Storm Water Runoff* (1995) 48 Wash. U.J. Urb. & Contemp. L.1, 40-41 [Regulation of Urban Storm Water Runoff].)

In 1987, Congress amended the CWA to require NPDES permits for storm water discharges. (See CWA § 402(p), 33 U.S.C. § 1342(p); *Defenders of Wildlife,* 191 F.3d at 1163; *Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1296.) In these amendments, enacted as part of the Water Quality Act of 1987, Congress distinguished between industrial and municipal storm water discharges. With respect to industrial storm water discharges, Congress provided that NPDES permits "shall meet all applicable provisions of this section and section 1311 [requiring the USEPA to establish effluent limitations under specific timetables]." (CWA § 402(p)(3)(A), 33 U.S.C. § 1342(p)(3)(A); see also *Defenders of Wildlife,* 191 F.3d at 1163-64.)

In 1990, USEPA adopted regulations specifying what activities were considered "industrial" and thus required discharges of storm water associated with those activities to obtain coverage under NPDES permits. (55 Fed. Reg. 47,990 (1990); 40 C.F.R. § 122.26(b)(14).) Construction activities, deemed a subset of the industrial activities category, must also be regulated by an NPDES permit. (40 C.F.R. § 122.26(b)(14)(x)). In 1999, USEPA issued regulations for "Phase II" of storm water regulation, which required most small construction sites (1-5 acres) to be regulated under the NPDES program. (64 Fed. Reg. 68,722; 40 C.F.R. § 122.26(b)(15)(i).)

2. Court Decisions on Public Participation

Two recent federal court opinions have vacated USEPA rules that denied meaningful public review of NPDES permit conditions. On January 14, 2003, the Ninth Circuit Court of Appeals held that certain aspects of USEPA's Phase II regulations governing MS4s were invalid primarily because the general permit did not contain express requirements for public participation. (*Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832.) Specifically, the court determined that applications for general permit coverage (including the Notice of Intent (NOI) and Storm Water Management Program (SWMP)) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. (*Id.* at 852-54.) Similarly, on February 28, 2005, the Second Circuit Court of Appeals held that the USEPA's confined animal feeding operation (CAFO) rule violated the CWA because it allowed dischargers to write their own nutrient management plans without public review. (*Waterkeeper Alliance v. USEPA* (2d Cir. 2005) 399 F.3d 486.) Although neither decision involved the issuance of construction storm water permits, the State Water Board's Office of Chief Counsel has recommended that the new General Permit address the courts' rulings where feasible[1].

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[1] In *Texas Independent Producers and Royalty Owners Assn. v. USEPA* (7th Cir. 2005) 410 F.3d 964, the Seventh Circuit Court of Appeals held that the USEPA's construction general permit was not required to provide the public with the opportunity for a public hearing on the Notice of Intent or Storm Water Pollution Prevention Plan. The Seventh Circuit briefly discussed why it agreed with the Ninth Circuit's dissent in *Environmental Defense Center*, but

The CWA and the USEPA's regulations provide states with the discretion to formulate permit terms, including specifying best management practices (BMPs), to achieve strict compliance with federal technology-based and water quality-based standards. (*Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) Accordingly, this General Permit has developed specific BMPs as well as numeric action levels (NALs) in order to achieve these minimum federal standards. In addition, the General Permit requires a SWPPP and REAP (another dynamic, site-specific plan) to be developed but has removed all language requiring the discharger to implement these plans – instead, the discharger is required to comply with specific requirements. By requiring the dischargers to implement these specific BMPs and NALs, this General Permit ensures that the dischargers do not "write their own permits." As a result this General Permit does not require each discharger's SWPPP and REAP to be reviewed and approved by the Regional Water Boards.

This General Permit also requires dischargers to electronically file all permit-related compliance documents. These documents include, but are not limited to, NOIs, SWPPPs, annual reports, Notice of Terminations (NOTs), and numeric action level (NAL) exceedance reports. Electronically submitted compliance information is immediately available to the public, as well as the Regional Water Quality Control Board (Regional Water Board) offices, via the Internet. In addition, this General Permit enables public review and hearings on permit applications when appropriate. Under this General Permit, the public clearly has a meaningful opportunity to participate in the permitting process.

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generally did not discuss the substantive holdings in *Environmental Defense Center* and *Waterkeeper Alliance*, because neither court addressed the initial question of whether the plaintiffs had standing to challenge the permits at issue. However, notwithstanding the Seventh Circuit's decision, it is not binding or controlling on the State Water Board because California is located within the Ninth Circuit.

C. Blue Ribbon Panel of Experts and Feasibility of Numeric Effluent Limitations

In 2005 and 2006, the State Water Board convened an expert panel (panel) to address the feasibility of numeric effluent limitations (NELs) in California's storm water permits. Specifically, the panel was asked to address:

"Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"

"The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

The ability of the State Water Board to establish appropriate objective limitations or criteria;

How compliance determinations would be made;

The ability of dischargers and inspectors to monitor for compliance; and

The technical and financial ability of dischargers to comply with the limitations or criteria."

Through a series of public participation processes (State Water Board meetings, State Water Board workshops, and the solicitation of written comments), a number of water quality, public process and overall program effectiveness problems were identified. Some of these problems are addressed through this General Permit.

D. Summary of Panel Findings on Construction Activities

The panel's final report can be downloaded and viewed through links at www.waterboards.ca.gov or by clicking here[2].

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge."

"Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes."

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[2] http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel_final_report.pdf

"Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use."

"To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites."

"Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors."

"The quality of storm water discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography."

"The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier."

In addition, the panel made the following conclusions:

"It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with storm water discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible."

"The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to storm water."

"The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond."

E. How the Panel's Findings are Used in this General Permit

The State Water Board carefully considered the findings of the panel and related public comments. The State Water Board also reviewed and considered the comments regarding statewide storm water policy and the reissuance of the Industrial General Permit. From the input received the State Water Board identified some permit and program performance gaps that are addressed in this General Permit. The Summary of Significant Changes (below) in this General Permit are a direct result of this process.

F. Summary of Significant Changes in This General Permit

The State Water Board has significant changes to Order 99-08-DWQ. This General Permit differs from Order 99-08-DWQ in the following significant ways:

Rainfall Erosivity Waiver: this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: this General Permit includes NALs for pH and turbidity.

Risk-Based Permitting Approach: this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.

Minimum Requirements Specified: this General Permit imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

Effluent Monitoring and Reporting: this General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to evaluate whether NALs and NELs for Active Treatment Systems included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: this General Permit requires some Risk Level 3 and LUP Type 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Storm Water Performance Standards: this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize and/or mitigate post-construction storm water runoff impacts.

Rain Event Action Plan: this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic information.

Certification/Training Requirements for Key Project Personnel: this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

II. RATIONALE

A. General Permit Approach

A general permit for construction activities is an appropriate permitting approach for the following reasons:

1. A general permit is an efficient method to establish the essential regulatory requirements for a broad range of construction activities under differing site conditions;

2. A general permit is the most efficient method to handle the large number of construction storm water permit applications;

3. The application process for coverage under a general permit is far less onerous than that for individual permit and hence more cost effective;

4. A general permit is consistent with USEPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the CWA in designing a workable and efficient permitting system; and

5. A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with water quality standards for discharges. In most cases, the general permit will provide sufficient and appropriate management requirements to protect the quality of receiving waters from discharges of storm water from construction sites.

There may be instances where a general permit is not appropriate for a specific construction project. A Regional Water Board may require any discharger otherwise covered under the General Permit to apply for and obtain an Individual Permit or apply for coverage under a more specific General Permit. The Regional Water Board must determine that this General Permit does not provide adequate assurance that water quality will be protected, or that there is a site-specific reason why an individual permit should be required.

B. Construction Activities Covered

1. **Construction activity subject to this General Permit:**

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with LUPs including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete

and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[3]

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction[4] (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

2. Linear Underground/Overhead Projects (LUPs) subject to this General Permit:

Underground/overhead facilities typically constructed as LUPs include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Water Quality Order 2003-0007-DWQ regulated construction activities associated with small LUPs that resulted in land disturbances greater than one acre, but less than five acres. These projects were considered non-traditional construction projects. Attachment A of this Order now regulates all construction activities from LUPs resulting in land disturbances greater than one acre.

3. Common Plan of Development or Sale

USEPA regulations include the term "common plan of development or sale" to ensure that acreage within a common project does not artificially escape the permit requirements because construction activities are phased, split among smaller parcels, or completed by different owners/developers. In the absence of an

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[3] Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the USEPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

[4] A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the Regional Water Board or State Water Board.

exact definition of "common plan of development or sale," the State Water Board is required to exercise its regulatory discretion in providing a common sense interpretation of the term as it applies to construction projects and permit coverage. An overbroad interpretation of the term would render meaningless the clear "one acre" federal permitting threshold and would potentially trigger permitting of almost any construction activity that occurs within an area that had previously received area-wide utility or road improvements.

Construction projects generally receive grading and/or building permits (Local Permits) from local authorities prior to initiating construction activity. These Local Permits spell out the scope of the project, the parcels involved, the type of construction approved, etc. Referring to the Local Permit helps define "common plan of development or sale." In cases such as tract home development, a Local Permit will include all phases of the construction project including rough grading, utility and road installation, and vertical construction. All construction activities approved in the Local Permit are part of the common plan and must remain under the General Permit until construction is completed. For custom home construction, Local Permits typically only approve vertical construction as the rough grading, utilities, and road improvements were already independently completed under the a previous Local Permit. In the case of a custom home site, the homeowner must submit plans and obtain a distinct and separate Local Permit from the local authority in order to proceed. It is not the intent of the State Water Board to require permitting for an individual homeowner building a custom home on a private lot of less than one acre if it is subject to a separate Local Permit. Similarly, the installation of a swimming pool, deck, or landscaping that disturbs less than one acre that was not part of any previous Local Permit are not required to be permitted.

The following are several examples of construction activity of less than one acre that would require permit coverage:

a. A landowner receives a building permit(s) to build tract homes on a 100-acre site split into 200 one-third acre parcels, (the remaining acreage consists of streets and parkways) which are sold to individual homeowners as they are completed. The landowner completes and sells all the parcels except for two. Although the remaining two parcels combined are less than one acre, the landowner must continue permit coverage for the two parcels.

b. One of the parcels discussed above is sold to another owner who intends to complete the construction as already approved in the Local Permit. The new landowner must file Permit Registration Documents (PRDs) to complete the construction even if the new landowner is required to obtain a separate Local Permit.

c. Landowner in (1) above purchases 50 additional one half-acre parcels adjacent to the original 200-acre project. The landowner seeks a Local Permit (or amendment to existing Local permit) to build on 20 parcels while leaving the remaining 30 parcels for future development. The landowner must amend PRDs to include the 20 parcels 14 days prior to commencement of construction activity on those parcels.

C. Construction Activities Not Covered

1. Traditional Construction Projects Not Covered

This General Permit does not apply to the following construction activity:

a. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

b. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

c. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

d. Discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction projects in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit. Construction projects within the Lahontan region must also comply with the Lahontan Region Project Guideline for Erosion Control (R6T-2005-0007 Section), which can be found at **http://www.waterboards.ca.gov/lahontan/Adopted_Orders/2005/r6t_2005_0007.pdf**

e. Construction activity that disturbs less than one acre of land surface, unless part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

f. Construction activity covered by an individual NPDES Permit for storm water discharges.

g. Landfill construction activity that is subject to the Industrial General Permit.

h. Construction activity that discharges to Combined Sewer Systems.

i. Conveyances that discharge storm water runoff combined with municipal sewage.

j. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

2. **Linear Projects Not Covered**

a. LUP construction activity does not include linear routine maintenance projects. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

i. Maintain the original purpose of the facility or hydraulic capacity.

ii. Update existing lines[5] and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.

iii. Repairing leaks.

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[5]Update existing lines includes replacing existing lines with new materials or pipes.

Routine maintenance does not include construction of new[6] lines or facilities resulting from compliance with applicable codes, standards, and regulations.

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must secure new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

b. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

c. Tie-ins conducted immediately adjacent to "energized" or "pressurized" facilities by the discharger are not considered construction activities where all other LUP construction activities associated with the tie-in are covered by an NOI and SWPPP of a third party or municipal agency.

3. **EPA's Small Construction Rainfall Erosivity Waiver**

EPA's Storm Water Phase II Final Rule provides the option for a Small Construction Rainfall Erosivity Waiver. This waiver applies to small construction sites between 1 and 5 acres, and allows permitting authorities to waive those sites that do not have adverse water quality impacts.

Dischargers eligible for this waiver are exempt from Construction General Permit Coverage. In order to obtain the waiver, the discharger must certify to the State Water Board that small construction activity will occur only when the rainfall erosivity factor is less than 5 ("R" in the Revised Universal Soil Loss Equation). The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a practice that provides interim non-vegetative stabilization can be used for the end of the construction period. The operator must agree (as a condition waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the General Permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with a certification statement constitutes acceptance of and commitment to complete the final stabilization process. The discharger must submit a waiver certification to the State Board prior to commencing construction activities.

USEPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. Dischargers can access the calculator from EPA's website at: www.epa.gov/npdes/stormwater/cgp. Use of the calculator allows the discharger to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage.

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[6]New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

D. Obtaining and Terminating Permit Coverage

The appropriate Legally Responsible Person (LRP) must obtain coverage under this General Permit. To obtain coverage, the LRP or the LRP's Approved Signatory must file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

To obtain coverage under this General Permit, LRPs must electronically file the PRDs, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by this General Permit, and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Boards may issue General Permits or Individual Permits that contain more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers that obtain coverage under Individual Permits.

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

The application requirements of the General Permit establish a mechanism to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the General Permit's requirements.

This General Permit provides a grandfathering exception to existing dischargers subject to Water Quality Order No. 99-08-DWQ. Construction projects covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at Risk Level 1. LUP projects covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage at LUP Type 1. The Regional Water Boards have the authority to require Risk Determination to be performed on projects currently covered under Water Quality Order No. 99-08-DWQ and 2003-0007-DWQ where they deem necessary.

LRPs must file a Notice of Termination (NOT) with the Regional Water Board when construction is complete and final stabilization has been reached or ownership has been transferred. The discharger must certify that all State and local requirements have been met in accordance with this General Permit. In order for construction to be found complete, the discharger must install post-construction storm water management measures and establish a long-term maintenance plan. This requirement is intended to ensure that the post-construction conditions at the project site do not cause or contribute to direct or indirect water quality impacts (i.e., pollution and/or hydromodification) upstream and downstream. Specifically, the discharger must demonstrate compliance with the post-construction standards set forth in this General Permit (Section XIII). The discharger is responsible for all compliance issues including all annual fees until the NOT has been filed and approved by the local Regional Water Board.

E. Discharge Prohibitions

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions set forth in the Order. This General Permit prohibits the discharge of pollutants other than storm water and non-storm water discharges authorized by this General Permit or another NPDES permit. This General Permit also prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the nine Regional Water Boards. Discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural BMPs. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction projects. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Therefore this General Permit authorizes such discharges provided they meet the following conditions.

These authorized non-storm water discharges must:

1. be infeasible to eliminate;
2. comply with BMPs as described in the SWPPP;
3. filter or treat, using appropriate technology, all dewatering discharges from sedimentation basins;
4. meet the NALs for pH and turbidity; and
5. not cause or contribute to a violation of water quality standards.

Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges.

This General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

F. Effluent Standards for All Types of Discharges

1. Technology-Based Effluent Limitations

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) for toxic pollutants and non conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. Additionally, these provisions require controls of pollutant discharges to reduce pollutants and any more stringent controls necessary to meet water quality standards. The USEPA has already established such limitations, known as effluent limitation guidelines (ELGs), for some industrial categories. This is not the case with construction discharges. In instances where there are no ELGs the permit writer is to use best professional judgment (BPJ) to establish requirements that the discharger must meet using BAT/BCT technology. This General Permit contains only narrative effluent limitations and does not contain numeric effluent limitations, except for Active Treatment Systems (ATS).

Order No. 2009-0009-DWQ, as originally adopted by the State Water Board on September 2, 2009, contained numeric effluent limitations for pH (within the range of 6.0 and 9.0 pH units) and turbidity (500 NTU) that applied only to Risk Level 3 and LUP Type 3 construction sites. The State Water Board adopted the numeric effluent limitations as technology-based effluent limitations based upon its best professional judgment. The California Building Industry Association, the Building Industry Legal Defense

Foundation, and the California Business Properties Association (petitioners) challenged Order No. 2009-0009-DWQ in *California Building Industry Association et al. v. State Water Resources Control Board.* On December 27, 2011, the Superior Court issued a judgment and writ of mandamus. The Superior Court ruled in favor of the State Water Board on almost all of the issues the petitioners raised, but the Superior Court invalidated the numeric effluent limitations for pH and turbidity for Risk Level 3 and LUP Type 3 sites because it determined that the State Water Board did not have sufficient BMP performance data to support those numeric effluent limitations. Therefore, the Superior Court concluded that the State Water Board did not comply with the federal regulations that apply to the use of best professional judgment. In invalidating the numeric effluent limitations, the Superior Court also suspended two ancillary requirements (a compliance storm event provision and receiving water monitoring at Risk Level 3 and LUP Type 3 sites that violated the numeric effluent limitations) that related solely to the invalidated numeric effluent limitations.

As a result of the Superior Court's writ of mandamus, this Order no longer contains numeric effluent limitations for pH and turbidity, except for ATS. In addition, as a result of the Superior Court's writ of mandamus, the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 sites were suspended until the State Water Board amended this Order to restore the receiving water monitoring requirements. As amended, this Order now requires Risk Level 3 and LUP Type 3 Dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers. The receiving water monitoring triggers were established at the same levels as the previous numeric effluent limitations (effluent pH outside the range of 6.0 and 9.0 pH units or turbidity exceeding 500 NTU). In restoring the receiving water monitoring requirements, the State Water Board determined that it was appropriate to require receiving water monitoring for these types of sites with direct discharges to surface waters that exceeded the receiving water monitoring triggers under any storm event scenarios, because these sites represent the highest threat to receiving water quality. An exceedance of a receiving water monitoring trigger does not constitute a violation of this General Permit. These receiving water monitoring requirements take effect on the effective date of the amendment to this Order.

BAT/BCT technologies not only include passive systems such as conventional runoff and sediment control, but-also treatment systems such as coagulation/flocculation using sand filtration, when appropriate. Such technologies allow for effective treatment of soil particles less 0.02 mm (medium silt) in diameter. The discharger must install structural-controls, as necessary, such as erosion and sediment controls that meet BAT and BCT to achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Because the permit is an NPDES permit, there is no legal requirement to address the factors set forth in Water Code sections 13241 and 13263, unless the permit is more stringent than what federal law requires. (See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 627.) None of the requirements in this permit are more stringent than the minimum federal requirements, which include technology-based requirements achieving BAT/BCT and strict compliance with water quality standards. The inclusion of numeric effluent limitations (NELs) in the permit for Active Treatment Systems does not cause the permit to be more stringent than current federal law. NELs and best management practices are simply two different-methods of achieving the same federal requirement: strict compliance with state water quality standards. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The use of NELs to achieve compliance with water quality standards is not a more stringent requirement than the use of BMPs. (State Water Board Order No. WQ 2006-0012 (*Boeing*).) Accordingly, the State Water Board does not need to take into account the factors in Water Code sections 13241 and 13263.

The State Water Board has concluded that the establishment of BAT/BCT will not create or aggravate other environmental problems through increases in air pollution, solid waste generation, or energy consumption.–While there may be a slight increase in non-water quality impacts due to the implementation of additional monitoring or the construction of additional BMPs, these impacts will be negligible in comparison with the construction activities taking place on site and would be justified by the water quality benefits associated with compliance.

pH Receiving Water Monitoring Trigger

Given the potential contaminants, the minimum standard method for control of pH in runoff requires the use of preventive measures such as avoiding concrete pours during rainy weather, covering concrete and directing flow away from fresh concrete if a pour occurs during rain, covering scrap drywall and stucco materials when stored outside and potentially exposed to rain, and other housekeeping measures. If necessary, pH-impaired storm water from construction sites can be treated in a filter or settling pond or basin, with additional natural or chemical treatment required to meet pH limits set forth in this permit. The basin or pond acts as a collection point and holds storm water for a sufficient period for the contaminants to be settled out, either naturally or artificially, and allows any additional treatment to take place. The State Water Board considers these techniques to be equivalent to BCT. In determining the pH concentration trigger for discharges, the State Water Board used BPJ to set these limitations.

The chosen trigger was established by calculating three standard deviations above and below the mean pH of runoff from highway construction sites[7] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.0 to 9.0 pH Units.

Turbidity Receiving Water Monitoring Trigger

The Turbidity receiving water monitoring trigger of 500 NTU is a technology-based trigger and was developed using three different analyses aimed at finding the appropriate threshold to set the technology-based limit to ensure environmental protection, effluent quality and cost-effectiveness. The analyses fell into three, main types: (1) an ecoregion-specific dataset developed by Simon et. al. (2004) [8]; (2) Statewide Regional Water Quality Control Board enforcement data; and (3) published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites.

A 1:3 relationship between turbidity (expressed as NTU) and suspended sediment concentration (expressed as mg/L) is assumed based on a review of suspended sediment and turbidity data from three gages used in the USGS National Water Quality Assessment Program:

USGS 11074000 SANTA ANA R BL PRADO DAM CA
USGS 11447650 SACRAMENTO R A FREEPORT CA
USGS 11303500 SAN JOAQUIN R NR VERNALIS CA

The receiving water monitoring trigger represents staff determination that the trigger value is the most practicable based on available data. The turbidity receiving water monitoring trigger represents a bridge between the narrative effluent limitations and receiving water limitations. To support this receiving water monitoring trigger, State Water Board staff analyzed construction site discharge information (monitoring data, estimates) and receiving water monitoring information.

Since the turbidity receiving water monitoring trigger represents an appropriate threshold level expected at a site, compliance with this value does not necessarily represent compliance with either the narrative effluent limitations (as enforced through the BAT/BCT standard) or the receiving water limitations. In the San Diego region, some inland surface waters have a receiving water objective for turbidity equal to 20 NTU. Obviously a discharge up to, but not exceeding, the turbidity receiving water monitoring trigger of

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[7] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf.

500 NTU may still cause or contribute to the exceedance of the 20 NTU standard. Most of the waters of the State are protected by turbidity objectives based on background conditions.

Table 1 - Regional Water Board Basin Plans, Water Quality Objectives for Turbidity

REGIONAL WATER BOARD	WQ Objective	Background/Natural Turbidity	Maximum Increase
1	Based on background	All levels	20%
2	Based on background	> 50 NTU	10%
3	Based on background	0-50 JTU 50-100 JTU > 100 JTU	20% 10 NTU 10%
4	Based on background	0-50 NTU > 50 NTU	20% 10%
5	Based on background	0-5 NTU 5-50 NTU 50-100 NTU >100 NTU	1 NTU 20% 10 NTU 10%
6	Based on background	All levels	10%
7	Based on background	N/A	N/A
8	Based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%
9	Inland Surface Waters, 20 NTU All others, based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%

Table 2 shows the suspended sediment concentrations at the 1.5 year flow recurrence interval for the 12 ecoregions in California from Simon et. al (2004).

Table 2 - Results of Ecoregion Analysis

Ecoregion	Percent of California Land Area	Median Suspended Sediment Concentration (mg/L)
1	9.1	874
4	0.2	120
5	8.8	35.6
6	20.7	1530
7	7.7	122
8	3.0	47.4
9	9.4	284
13	5.2	143
14	21.7	5150
78	8.1	581
80	2.4	199
81	3.7	503
Area-weighted average		1633

If a 1:3 relationship between turbidity and suspended sediment is assumed, the median turbidity is 544 NTU.

The following table is composed of turbidity readings measured in NTUs from administrative civil liability (ACL) actions for construction sites from 2003 - 2009. This data was derived from the complete listing of construction-related ACLs for the six year period. All ACLs were reviewed and those that included turbidimeter readings at the point of storm water discharge were selected for this dataset.

Table 3 – ACL Sampling Data taken by Regional Water Board Staff

WDID#	Region	Discharger	Turbidity (NTU)
5S34C331884	5S	Bradshaw Interceptor Section 6B	1800
5S05C325110	5S	Bridalwood Subdivision	1670
5S48C336297	5S	Cheyenne at Browns Valley	1629
5R32C314271	5R	Grizzly Ranch Construction	1400
6A090406008	6T	El Dorado County Department of Transportation, Angora Creek	97.4
5S03C346861	5S	TML Development, LLC	1600
6A31C325917	6T	Northstar Village	See Subdata Set

Subdata Set - Turbidity for point of storm water runoff discharge at Northstar Village

Date	Turbidity (NTU)	Location
10/5/2006	900	Middle Martis Creek
11/2/2006	190	Middle Martis Creek
01/04/2007	36	West Fork, West Martis Creek
02/08/2007	180	Middle Martis Creek
02/09/2007	130	Middle Martis Creek
02/09/2007	290	Middle Martis Creek
02/09/2007	100	West Fork, West Martis Creek
02/10/2007	28	Middle Martis Creek
02/10/2007	23	Middle Martis Creek
02/10/2007	32	Middle Martis Creek
02/10/2007	12	Middle Martis Creek
02/10/2007	60	West Fork, West Martis Creek
02/10/2007	34	West Fork, West Martis Creek

A 95% confidence interval for mean turbidity in an ACL order was constructed. The data set used was a small sample size, so the 500 NTU (the value derived as the receiving water monitoring trigger for this General Permit) needed to be verified as a possible population mean. In this case, the population refers to a hypothetical population of turbidity measurements of which our sample of 20 represents. A t-distribution was assumed due to the small sample size:

Mean: 512.23 NTU Standard Deviation: 686.85 **Margin of** Error: 321.45 Confidence Interval: 190.78 NTU (Low) 833.68 NTU (High)

Based on a constructed 95% confidence interval, an ACL order turbidity measurement will be between 190.78 – 833.68 NTU. 500 NTU falls within this range. Using the same data set, a small-sample hypothesis test was also performed to test if the ACL turbidity data set contains enough information to cast doubt on choosing a 500 NTU as a mean. 500 NTU was again chosen due to its proposed use as an acceptable value. The test was carried out using a 95% confidence interval. Results indicated that the ACL turbidity data set *does not* contain significant sample evidence to reject the claim of 500 NTU as an acceptable mean for the ACL turbidity population.

There are not many published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites. The most often cited study is a report titled, "Improving the Cost Effectiveness of Highway Construction Site Erosion and Pollution Control" (Horner, Guedry, and Kortenhof 1990, http://www.wsdot.wa.gov/Research/Reports/200/200.1.htm). In a comment letter summarizing this report sent to the State Water Board, the primary author, Dr. Horner, states:

"The most effective erosion control product was wood fiber mulch applied at two different rates along with a bonding agent and grass seed in sufficient time before the tests to achieve germination. Plots treated in this way reduced influent turbidity by more than 97 percent and discharged effluent exhibiting mean and maximum turbidity values of 21 and 73 NTU, respectively. Some other mulch and blanket materials performed nearly as well. These tests demonstrated the control ability of widely available BMPs over a very broad range of erosion potential."

Other technologies studied in this report produced effluent quality at or near 100 NTU. It is the BPJ of the State Water Board staff that erosion control, while preferred, is not always an option on construction sites and that technology performance in a controlled study showing effluent quality directly leaving a BMP is always easier and cheaper to control than effluent being discharged from the project (edge of property, etc.). As a result, it is the BPJ of the State Water Board staff that it is not cost effective or feasible, at this time, for all risk level and type 3 sites in California to achieve effluent discharges with turbidity values that are less than 100 NTU.

To summarize, the analysis showed that: (1) results of the Simon et. al dataset reveals turbidity values in background receiving water in California's ecoregions range from 16 NTU to 1716 NTU (with a mean of 544 NTU); (2) based on a constructed 95% confidence interval, construction sites will be subject to administrative civil liability (ACL) when their turbidity measurement falls between 190.78 – 833.68 NTU; and (3) sites with highly controlled discharges employing and maintaining good erosion control practices can discharge effluent from the BMP with turbidity values less than 100 NTU. State Water Board staff has determined, using its BPJ, that it is most cost effective to set the receiving water monitoring trigger for turbidity at 500 NTU.

i. *Compliance Storm Event*

While this General Permit no longer contains "compliance storm event" exceptions from technology-based NELs, the "compliance storm event" exception from the ATS NELs remain in effect. See Section K of this Fact Sheet, and Attachment F of this General Permit for more information.

a. TMDLs and Waste Load Allocations

Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL for sediment has been adopted by the Regional Water Board or USEPA, must comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of sediment. If it does, the

TMDL should include a specific waste load allocation for this activity/source. The discharger, in this case, may be required by a separate Regional Water Board order to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. If a specific waste load allocation has been established that would apply to a specific discharge, the Regional Water Board may adopt an order requiring specific implementation actions necessary to meet that allocation. In the instance where an approved TMDL has specified a general waste load allocation to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, dischargers must consult with the state TMDL authority[9] to confirm that adherence to a SWPPP that meets the requirements of the General Permit will be consistent with the approved TMDL.

2. Determining Compliance with Effluent Standards

a. Technology-Based Numeric Action Levels (NALs)

This General Permit contains technology-based NALs for pH and turbidity, and requirements for effluent monitoring at all Risk level 2 & 3, and LUP Type 2 & 3 sites. Numeric action levels are essentially numeric benchmark values for certain parameters that, if exceeded in effluent sampling, trigger the discharger to take actions. Exceedance of an NAL does not itself constitute a violation of the General Permit. If the discharger fails to take the corrective action required by the General Permit, though, that may consititute a violation.

The primary purpose of NALs is to assist dischargers in evaluating the effectiveness of their on-site measures. Construction sites need to employ many different systems that must work together to achieve compliance with the permit's requirements. The NALs chosen should indicate whether the systems are working as intended.

Another purpose of NALs is to provide information regarding construction activities and water quality impacts. This data will provide the State and Regional Water Boards and the rest of the storm water community with more information about levels and types of pollutants present in runoff and how effective the dischargers BMPs are at reducing pollutants in effluent. The State Water Board also hopes to learn more about the linkage between effluent and receiving water quality. In addition, these requirements will provide information on the mechanics needed to establish compliance monitoring programs at construction sites in future permit deliberations.

i. *pH*

The chosen limits were established by calculating one standard deviation above and below the mean pH of runoff from highway construction sites[10] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units.

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[9] http://www.waterboards.ca.gov/tmdl/tmdl.html.
[10] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf.

The Caltrans study included 33 highway construction sites throughout California over a period of four years, which included 120 storm events. All of these sites had BMPs in place that would be generally implemented at all types of construction sites in California.

ii. ***Turbidity***

BPJ was used to develop an NAL that can be used as a learning tool to help dischargers improve their site controls, and to provide meaningful information on the effectiveness of storm water controls. A statewide turbidity NAL has been set at 250 NTU.

G. Receiving Water Limitations

Construction-related activities that cause or contribute to an exceedance of water quality standards must be addressed. The dynamic nature of construction activity gives the discharger the ability to quickly identify and monitor the source of the exceedances. This is because when storm water mobilizes sediment, it provides visual cues as to where corrective actions should take place and how effective they are once implemented.

This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards. The monitoring requirements in this General Permit for sampling and analysis procedures will help determine whether BMPs installed and maintained are preventing pollutants in discharges from the construction site that may cause or contribute to an exceedance of water quality standards.

Water quality standards consist of designated beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. When adopted by the State Water Board or a Regional Water Board, the ambient criteria are termed "water quality objectives." If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to an exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff.)

In California, water quality standards are published in the Basin Plans adopted by each Regional Water Board, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan.

Dischargers can determine the applicable water quality standards by contacting Regional Water Board staff or by consulting one of the following sources. The actual Basin Plans that contain the water quality standards can be viewed at the website of the appropriate Regional Water Board. (http://www.waterboards.ca.gov/regions.html), the State Water Board site for statewide plans (http://www.waterboards.ca.gov/plnspols/index.html), or the USEPA regulations for the NTR and CTR (40 C.F.R. §§ 131.36-38). Basin Plans and statewide plans are also available by mail from the appropriate Regional Water Board or the State Water Board. The USEPA regulations are available at http://www.epa.gov/. Additional information concerning water quality standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

H. Training Qualifications and Requirements

The Blue Ribbon Panel (BRP) made the following observation about the lack of industry-specific training requirements:

"Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors."

Order 99-08-DWQ required that all dischargers train their employees on how to comply with the permit, but it did not specificy a curriculum or certification program. This has resulted in inconsistent implementation by all affected parties - the dischargers, the local governments where the construction activity occurs, and the regulators required to enforce 99-08-DWQ. This General Permit requires Qualified SWPPP Developers and practitioners to obtain appropriate training, and makes this curriculum mandatory two years after adoption, to allow time for course completion. The State and Regional Water Board are working with many stakeholders to develop the curriculum and mechanisms needed to develop and deliver the courses.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, the Qualified SWPPP Developer and Qualified SWPPP Practitioners responsible for creating, revising, overseeing, and implementing the SWPPP must attend a State Water Board-sponsored or approved Qualified SWPPP Developer and Qualified SWPPP Practitioner training course.

I. Sampling, Monitoring, Reporting and Record Keeping

1. Traditional Construction Monitoring Requirements

This General Permit requires visual monitoring at all sites, and effluent water quality at all Risk Level 2 & 3 sites. It requires receiving water monitoring at some Risk Level 3 sites. All sites are required to submit annual reports, which contain various types of information, depending on the site characteristics and events. A summary of the monitoring and reporting requirements is found in Table 4.

Table 4 - Required Monitoring Elements for Risk Levels

	Visual	Non-visible Pollutant	Effluent	Receiving Water
Risk Level 1	three types required for all Risk Levels: non-storm water, pre-rain and post-rain	As needed for all Risk Levels (see below)	where applicable	not required
Risk Level 2			pH, turbidity	not required
Risk Level 3			pH, turbidity	(if Receiving Water Monitoring Trigger exceeded) pH, turbidity and SSC. Bioassessment for sites 30 acres or larger.

a. Visual

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. For storm-related inspections, dischargers must visually observe storm water discharges at all discharge locations within two business days after a qualifying event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge. Dischargers must conduct a post-storm event inspection to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify any additional BMPs necessary and revise the SWPPP accordingly. Dischargers must maintain on-site records of all visual observations, personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

b. Non-Visible Pollutant Monitoring

This General Permit requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in storm water. Monitoring for non-visible pollutants must be required at any construction site when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

Of significant concern for construction discharges are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, such as cement, flyash, and other recycled materials or by-products of combustion. The water quality standards that apply to these materials will depend on their composition. Some of the more common storm water pollutants from construction activity are not CTR pollutants. Examples of non-visible pollutants include glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with storm water. High pH values from cement and gypsum, high pH and SSC from wash waters, and chemical/fecal contamination from portable toilets, also are not CTR pollutants. Although some of these constituents do have numeric water quality objectives in individual Basin Plans, many do not and are subject only to narrative water quality standards (i.e. not causing toxicity). Dischargers are encouraged to discuss these issues with Regional Water Board staff and other storm water quality professionals.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore receiving waters sampling is not required. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site.

Preventing or eliminating the exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions and at a time when they are unlikely to be washed away. Other construction materials can be exposed when storage, waste disposal or the application of the material is done in a manner not protective of water quality. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed. In cases where construction materials may be exposed to storm water, but the storm water is contained and is not allowed to run off the site, sampling will only be required when inspections show that the containment failed or is breached, resulting in potential exposure or discharge to receiving waters.

The discharger must develop a list of potential pollutants based on a review of potential sources, which will include construction materials soil amendments, soil treatments, and historic contamination at the site. The discharger must review existing environmental and real estate documentation to determine the potential for pollutants that could be present on the construction site as a result of past land use activities.

Good sources of information on previously existing pollution and past land uses include:

i. Environmental Assessments;

ii. Initial Studies;

iii. Phase 1 Assessments prepared for property transfers; and

iv. Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act.

In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

The potential pollutant list must include all non-visible pollutants that are known or should be known to occur on the construction site including, but not limited to, materials that:

i. are being used in construction activities;

ii. are stored on the construction site;

iii. were spilled during construction operations and not cleaned up;

iv. were stored (or used) in a manner that created the potential for a release of the materials during past land use activities;

v. were spilled during previous land use activities and not cleaned up; or

vi. were applied to the soil as part of past land use activities.

c. Effluent Monitoring

Federal regulations[11] require effluent monitoring for discharges subject to NALs. Subsequently, all Risk Level 2 and 3 dischargers must perform sampling and analysis of effluent discharges to characterize discharges associated with construction activity from the entire area disturbed by the project. Dischargers must collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

Table 5 - Storm Water Effluent Monitoring Requirements by Risk Level

	Frequency	Effluent Monitoring (Section E, below)
Risk Level 1	when applicable	non-visible pollutant parameters (if applicable)
Risk Level 2	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters (if applicable)
Risk Level 3	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters if applicable

Risk Level 1 dischargers must analyze samples for:

i. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment C contained in the General Permit.

[11] 40 C.F.R. § 122.44.

Risk Level 2 dischargers must analyze samples for:

i. pH and turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment D contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

Risk Level 3 dischargers must analyze samples for:

i. pH, turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment E contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

2. Linear Monitoring and Sampling Requirements

Attachment A, establishes minimum monitoring and reporting requirements for all LUPs. It establishes different monitoring requirements depending on project complexity and risk to water quality. The monitoring requirements for Type 1 LUPs are less than Type 2 & 3 projects because Type 1 projects have a lower potential to impact water quality.

A discharger shall prepare a monitoring program prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

a. Type 1 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 1 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be conducted in conjunction with other daily activities. Inspections will be conducted to ensure the BMPs are adequate, maintained, and in place at the end of the construction day. The discharger will revise the SWPPP, as appropriate, based on the results of the daily inspections. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures have been installed, and successful final vegetative cover or other stabilization criteria have been met).

A discharger shall implement the monitoring program for inspecting Type 1 LUPs. This program requires temporary and permanent stabilization BMPs after active construction is completed. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where re-vegetation is chosen until minimum vegetative coverage has been established. Photographs shall be taken during site inspections and submitted to the State Water Board.

b. Type 2 & 3 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 2 & 3 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be in conjunction with other daily activities.

All dischargers of Type 2 & 3 LUPs are required to conduct inspections by qualified personnel of the construction site during normal working hours prior to all anticipated storm events and after actual storm events. During extended storm events, the discharger shall conduct inspections during normal working hours for each 24-hour period. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures installed, and successful vegetative cover or other stabilization criteria have been met).

The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) to determine whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

All dischargers shall develop and implement a monitoring program for inspecting Type 2 & 3 LUPs that require temporary and permanent stabilization BMPs after active construction is completed. Inspections will be conducted to ensure the BMPs are adequate and maintained. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where revegetation is chosen until minimum vegetative coverage has been established.

A log of inspections conducted before, during, and after the storm events must be maintained in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection. Photographs must be taken during site inspections and submitted to the State Water Board.

c. Sampling Requirements for all LUP Project Types

LUPs are also subject to sampling and analysis requirements for visible pollutants (i.e., sedimentation/siltation, turbidity) and for non-visible pollutants.

Sampling for visible pollutants is required for Type 2 & 3 LUPs.

Non-visible pollutant monitoring is required for pollutants associated with construction sites and activities that (1) are not visually detectable in storm water discharges, and (2) are known or should be known to occur on the construction site, and (3) could cause or contribute to an exceedance of water quality objectives in the receiving waters. Sample collection for non-visible pollutants must only be required (1) during a storm event when pollutants associated with construction activities may be discharged with storm water runoff due to a spill, or in the event there was a breach, malfunction, failure, and/or leak of any BMP, and (2) when the discharger has failed to adequately clean the area of material and pollutants. Failure to implement appropriate BMPs will trigger the same sampling requirements as those required for a breach, malfunction and/or leak, or when the discharger has failed to implement appropriate BMPs prior to the next storm event.

Additional monitoring parameters may be required by the Regional Water Boards.

It is not anticipated that many LUPs will be required to collect samples for pollutants not visually detected in runoff due to the nature and character of the construction site and activities as previously described in this fact sheet. Most LUPs are constructed in urban areas with public access (e.g., existing roadways, road shoulders, parking areas, etc.). This raises a concern regarding the potential contribution of pollutants from vehicle use and/or from normal activities of the public (e.g., vehicle washing, landscape fertilization, pest spraying, etc.) in runoff from the project site. Since the dischargers are not the land owners of the project area and are not able to control the presence of these pollutants in the storm water that runs through their projects, it is not the intent of this General Permit to require dischargers to sample for these pollutants. This General Permit does not require the discharger to sample for these types of pollutants except where the discharger has brought materials onsite that contain these pollutants and when a condition (e.g., breach, failure, etc.) described above occurs.

3. Receiving Water Monitoring

In order to ensure that receiving water limitations are met, discharges subject to receiving water monitoring triggers (i.e., Risk Level 3 and LUP Type 3 sites) or numeric effluent limitations (i.e., Risk Level 3 and LUP Type 3 sites utilizing ATS with direct discharges into receiving waters) must also monitor the downstream receiving water(s) for turbidity, SSC, and pH (if applicable) when a receiving water monitoring trigger or NEL is exceeded.

a. Bioassessment Monitoring

This General Permit requires a bioassessment of receiving waters for dischargers of Risk Level 3 or LUP Type 3 construction projects equal to or larger than 30 acres with direct discharges into receiving waters. Benthic macroinvertebrate samples will be taken upstream and downstream of the site's discharge point in the receiving water. Bioassessments measure the quality of the stream by analyzing the aquatic life present. Higher levels of appropriate aquatic species tend to indicate a healthy stream; whereas low levels of organisms can indicate stream degradation. Active construction sites have the potential to discharge large amounts of sediment and pollutants into receiving waters. Requiring a bioassessment for large project sites, with the most potential to impact water quality, provides a snapshot of the health of the receiving water prior to initiation of construction activities. This snapshot can be used in comparison to the health of the receiving water after construction has commenced.

Each ecoregion (biologically and geographically related area) in the State has a specific yearly peak time where stream biota is in a stable and abundant state. This time of year is called an Index Period. The bioassessment requirements in this General Permit, requires benthic macroinvertebrate sampling within a sites index period. The State Water Board has developed a map designating index periods for the ecoregions in the State (see State Water Board Website).

This General Permit requires the bioassessment methods to be in accordance with the Surface Water Ambient Monitoring Program (SWAMP) in order to provide data consistency within the state as well as generate useable biological stream data.

Table 6 - Receiving Water Monitoring Requirements

	Receiving Water Monitoring Parameters
Risk Level 1 /LUP Type 1	not required
Risk Level 2 / LUP Type 2	not required
Risk Level 3 / LUP Type 3	If Receiving Water Monitoring Trigger exceeded: pH (if applicable), turbidity, and SSC. Bioassessment for sites 30 acres or larger.

4. Reporting Requirements

a. NAL Exceedance Report

All Risk Level 3 and LUP Type 3 dischargers must electronically submit all storm event sampling results to the State And Regional Boards, via the electronic data system, no later than 10 days after the conclusion of the storm event.

b. Annual Report

All dischargers must prepare and electronically submit an annual report no later than September 1 of each year using the Storm water Multi-Application Reporting and Tracking System (SMARTS). The

Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year, and identification of any compliance activities or corrective actions that were not implemented.

5. Record Keeping

According to 40 C.F.R. Parts 122.21(p) and 122.41(j), the discharger is required to retain paper or electronic copies of all records required by this General Permit for a period of at least three years from the date generated or the date submitted to the State Water Board or Regional Water Boards. A discharger must retain records for a period beyond three years as directed by Regional Water Board.

J. Risk Determination

1. Traditional Projects

a. Overall Risk Determination

There are two major requirements related to site planning and risk determination in this General Permit. The project's overall risk is broken up into two elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters).

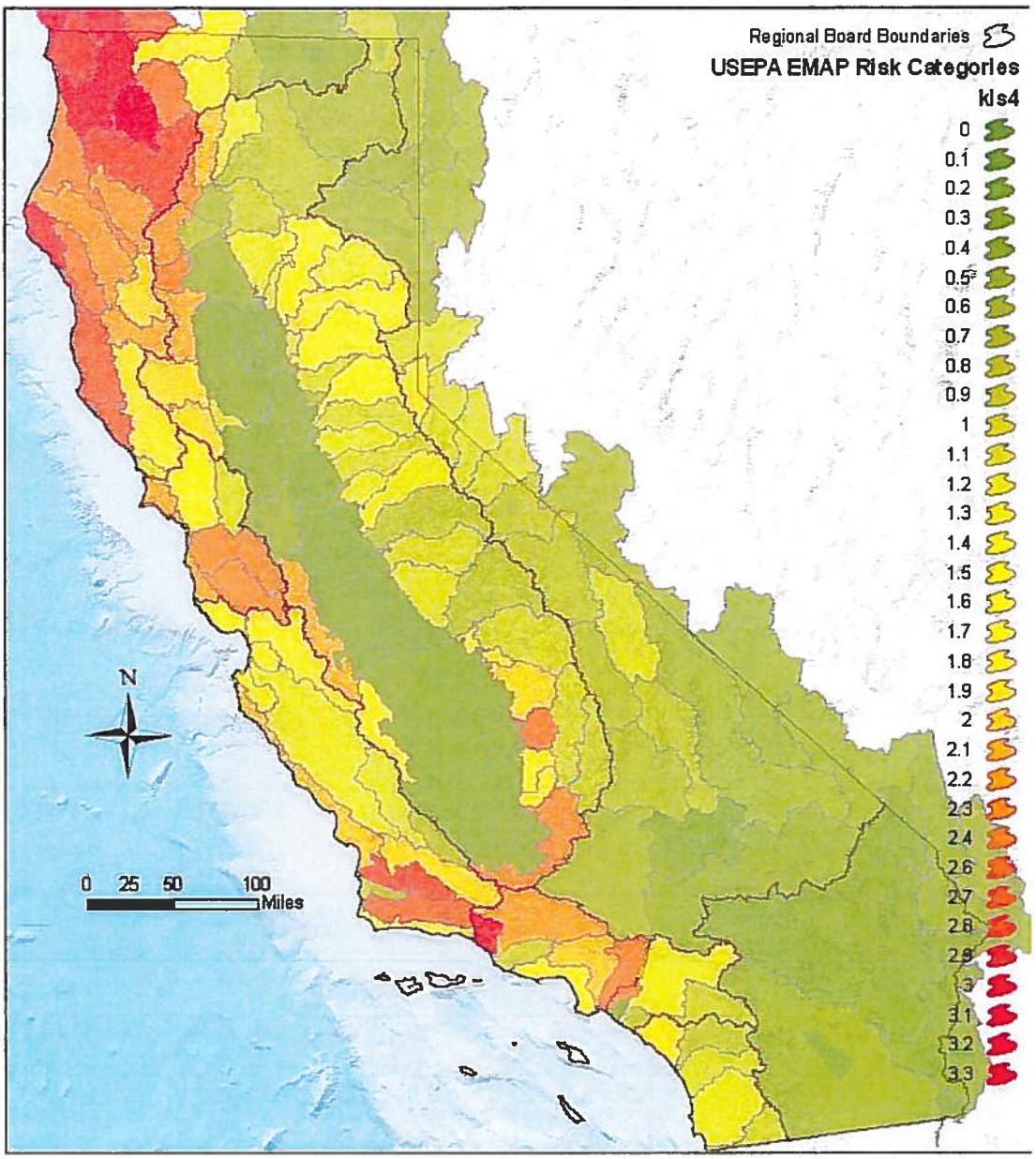
Project Sediment Risk:
Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. The RUSLE equation is as follows:

A = (R)(K)(LS)(C)(P)

Where: A = the rate of sheet and rill erosion
R = rainfall-runoff erosivity factor
K = soil erodibility factor
LS = length-slope factor
C = cover factor (erosion controls)
P = management operations and support practices (sediment controls)

The C and P factors are given values of 1.0 to simulate bare ground conditions.

There is a map option and a manual calculation option for determining soil loss. For the map option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The product of K and LS are shown on Figure 1. To determine soil loss in tons per acre, the discharger multiplies the R factor times the value for K times LS from the map.



Water Boards

State Water Resources Control Board, January 15, 2008

Figure 1 -Statewide Map of K * LS

For the manual calculation option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The K and LS factors are determined using Appendix 1.

Soil loss of less than 15 tons/acre is considered **low** sediment risk.
Soil loss between 15 and 75 tons/acre is **medium** sediment risk.
Soil loss over 75 tons/acre is considered **high** sediment risk.

The soil loss values and risk categories were obtained from mean and standard deviation RKLS values from the USEPA EMAP program. High risk is the mean RKLS value plus two standard deviations. Low risk is the mean RKLS value minus two standard deviations.

Receiving Water Risk:
Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either

on the most recent 303d list for waterbodies impaired for sediment;
has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; **or**
has the beneficial uses of COLD, SPAWN, and MIGRATORY.

A project that meets at least one of the three criteria has a high receiving water risk. A list of sediment-sensitive waterbodies will be posted on the State Water Board's website. It is anticipated that an interactive map of sediment sensitive water bodies in California will be available in the future.

The Risk Levels have been altered by eliminating the possibility of a Risk Level 4, and expanding the constraints for Risk Levels 1, 2, and 3. Therefore, projects with high receiving water risk and high sediment risk will be considered a Risk Level 3 risk to water quality.

In response to public comments, the Risk Level requirements have also been changed such that Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements, Risk Level 2 projects will be subject to NALs and some additional monitoring requirements, and Risk Level 3 projects will be subject to NALs, and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment.

Table 7 - Combined Risk Level Matrix

Combined Risk Level Matrix				
		Sediment Risk		
		Low	Medium	High
Receiving Water Risk	Low	Level 1	Level 2	
	High	Level 2		Level 3

b. Effluent Standards

All dischargers are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require storm water discharges associated with construction activity to meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutants and any more stringent controls necessary to meet water quality standards.

Risk Level 2 dischargers that pose a medium risk to water quality are subject to technology-based NALs for pH and turbidity. Risk Level 3 dischargers that pose a high risk to water quality are also subject to technology-based NALs for pH and turbidity.

c. Good Housekeeping

Proper handling and managing of construction materials can help minimize threats to water quality. The discharger must consider good housekeeping measures for: construction materials, waste management, vehicle storage & maintenance, landscape materials, and potential pollutant sources. Examples include; conducting an inventory of products used, implementing proper storage & containment, and properly cleaning all leaks from equipment and vehicles.

d. Non-Storm Water Management

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

e. Erosion Control

The best way to minimize the risk of creating erosion and sedimentation problems during construction is to disturb as little of the land surface as possible by fitting the development to the terrain. When development is tailored to the natural contours of the land, little grading is necessary and, consequently, erosion potential is lower.[14] Other effective erosion control measures include: preserving existing vegetation where feasible, limiting disturbance, and stabilizing and re-vegetating disturbed areas as soon as possible after grading or construction activities. Particular attention must be paid to large, mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded.[12]

Risk Level 3 dischargers pose a higher risk to water quality and are therefore additionally required to ensure that post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Sediment Control

Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only

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[12] U.S. Environmental Protection Agency. 2007. Developing Your Storm Water Pollution Prevention Plan: A Guide for Construction Sites.

examples of what should be considered and should not preclude new or innovative approaches currently available or being developed.

Because Risk Level 2 and 3 dischargers pose a higher risk to water quality, additional requirements for the application of sediment controls are imposed on these projects. This General Permit also authorizes the Regional Water Boards to require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of other erosion or sediment controls are not adequately protecting the receiving waters.

g. Run-on and Runoff Control

Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a project site. Examples include: installing berms and other temporary run-on and runoff diversions.

Risk Level 1 dischargers with lower risks to impact water quality are not subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required.

h. Inspection, Maintenance and Repair

All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended.

i. Rain Event Action Plan (REAP)

A Rain Event Action Plan (REAP) is a written document, specific for each rain event. A REAP should be designed that when implemented it protects all exposed portions of the site within 48 hours of any likely precipitation event forecast of 50% or greater probability.

This General Permit requires Risk Level 2 and 3 dischargers to develop and implement a REAP designed to protect all exposed portions of their sites within 48 hours prior to any likely precipitation event. The REAP requirement is designed to ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures that are intended to reduce the amount of sediment and other pollutants generated from the active site. A REAP must be developed when there is likely a forecast of 50% or greater probability of precipitation in the project area. (The National Oceanic and Atmospheric Administration (NOAA) defines a chance of precipitation as a probability of precipitation of 30% to 50% chance of producing precipitation in the project area.[13] NOAA defines the probability of precipitation (PoP) as the likelihood of occurrence (expressed as a percent) of a measurable amount (0.01 inch or more) of liquid precipitation (or the water equivalent of frozen precipitation) during a specified period of time at any given point in the forecast area.) Forecasts are normally issued for 12-hour time periods. Descriptive terms for uncertainty and aerial coverage are used as follows:

Table 8 -National Oceanic and Atmospheric Administration (NOAA) Definition of Probability of Precipitation (PoP)

[13] http://www.crh.noaa.gov/lot/severe/wxterms.php.

PoP	Expressions of Uncertainty	Aerial Coverage
0%	none used	none used
10%	none used	isolated
20%	slight chance	isolated
30-50%	chance	scattered
60-70%	likely	numerous
80-100%	none used	none used

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (http://www.srh.noaa.gov/).

2. **Linear Projects**

a. **Linear Risk Determination**

LUPs vary in complexity and water quality concerns based on the type of project. This General Permit has varying application requirements based on the project's risk to water quality. Factors that lead to the characterization of the project include location, sediment risk, and receiving water risk.

Based on the location and complexity of a project area or project section area, LUPs are separated into project types. As described below, LUPs have been categorized into three project types.

i. ***Type 1 LUPs***

Type 1 LUPs are those construction projects where:

(1) 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day, or

(2) greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

Areas disturbed during construction will be returned to pre-construction conditions or equivalent protection established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization Best Management Practices (BMPs) will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

Type 1 LUPs typically do not have a high potential to impact storm water quality because (1) these construction activities are not typically conducted during a rain event, (2) these projects are normally constructed over a short period of time[14], minimizing the duration that pollutants could potentially be exposed to rainfall; and (3) disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.

Type 1 LUPs are determined during the risk assessment found in Attachment A.1 to be 1) low sediment risk and low receiving water risk; 2) low sediment risk and medium receiving water risk; and 3) medium sediment risk and low receiving water risk.

This General Permit requires the discharger to ensure a SWPPP is developed for these construction activities that is specific to project type, location and characteristics.

ii. ***Type 2 LUPs:***

Type 2 projects are determined to have a combination of High, Medium, and Low project sediment risk along with High, Medium, and Low receiving water risk. Like Type 1 projects, Type 2 projects are typically constructed over a short period of time. However, these projects have a higher potential to impact water quality because they:

(1) typically occur outside the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location and characteristics.

iii. ***Type 3 LUPs:***

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[14] Short period of time refers to a project duration of weeks to months, but typically less than one year in duration.

Type 3 projects are determined to have a combination of High and Medium project sediment risk along with High and Medium receiving water risk. Similar to Type 2 projects, Type 3 projects have a higher potential to impact water quality because they:

(1) typically occur outside of the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location, and characteristics.

b. Linear Effluent Standards

All LUPs are subject to the narrative effluent limitations specified in the General Permit.

Type 2 and Type 3 projects are subject to technology-based NALs for pH and turbidity.

c. Linear Good Housekeeping

Improper use and handling of construction materials could potentially cause a threat to water quality. In order to ensure proper site management of these construction materials, all LUP dischargers must comply with a minimum set of Good Housekeeping measures specified in Attachment A of this General Permit.

d. Linear Non-Storm Water Management

In order to ensure control of all non-storm water discharges during construction, all LUP dischargers must comply with the Non-Storm Water Management measures specified in Attachment A of this General Permit.

e. Linear Erosion Control

This General Permit requires all LUP dischargers to implement effective wind erosion control measures, and soil cover for inactive areas. Type 3 LUPs posing a higher risk to water quality are additionally required to ensure the post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Linear Sediment Control

In order to ensure control and containment of all sediment discharges, all LUP dischargers must comply with the general Sediment Control measures specified in Attachment A or this General Permit. Additional requirements for sediment controls are imposed on Type 2 & 3 LUPs due to their higher risk to water quality.

g. Linear Run-on and Runoff Control

Discharges originating outside of a project's perimeter and flowing onto the property can adversely affect the quantity and quality of discharges originating from a project site. In order to ensure proper management of run-on and runoff, all LUPs must comply with the run-on and runoff control measures specified in Attachment A of this General Permit. Due to the lower risk of impacting water quality, Type 1 LUPs are not required to implement run-on and runoff controls unless deemed necessary by the discharger.

h. Linear Inspection, Maintenance and Repair

Proper inspection, maintenance, and repair activities are important to ensure the effectiveness of on-site measures to control water quality. In order to ensure that inspection, maintenance, and repair activities are adequately performed, the all LUP dischargers a re required to comply with the Inspection, Maintenance, and Repair requirements specified in Attachment A of this General Permit.

K. ATS[15] Requirements

There are instances on construction sites where traditional erosion and sediment controls do not effectively control accelerated erosion. Under such circumstances, or under circumstances where storm water discharges leaving the site may cause or contribute to an exceedance of a water quality standard, the use of an Active Treatment System (ATS) may be necessary. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.[16]

Although treatment systems have been in use in some form since the mid-1990s, the ATS industry in California is relatively young, and detailed regulatory standards have not yet been developed. Many developers are using these systems to treat storm water discharges from their construction sites. The new ATS requirements set forth in this General Permit are based on those in place for small wastewater treatment systems, ATS regulations from the Central Valley Regional Water Quality Control Board (September 2005 memorandum "2005/2006 Rainy Season – Monitoring Requirements for Storm Water Treatment Systems that Utilize Chemical Additives to Enhance Sedimentation"), the Construction Storm Water Program at the State of Washington's Department of Ecology, as well as recent advances in technology and knowledge of coagulant performance and aquatic safety.

The effective design of an ATS requires a detailed survey and analysis of site conditions. With proper planning, ATS performance can provide exceptional water quality discharge and prevent significant impacts to surface water quality, even under extreme environmental conditions.

These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). The State Water Board is concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition

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[15] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation in order to reduce turbidity caused by fine suspended sediment.
[16] Pitt, R., S. Clark, and D. Lake. 2006. Construction Site Erosion and Sediment Controls: Planning, Design, and Performance. DEStech Publications. Lancaster, PA. 370pp.

to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern.[17] For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation.[18] Due to the potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, this General Permit establishes residual polymer monitoring and toxicity testing requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.

The primary treatment process in an ATS is coagulation/flocculation. ATS's operate on the principle that the added coagulant is bound to suspended sediment, forming floc, which is gravitationally settled in tanks or a basin, or removed by sand filters. A typical installation utilizes an injection pump upstream from the clarifier tank, basin, or sand filters, which is electronically metered to both flow rate and suspended solids level of the influent, assuring a constant dose. The coagulant mixes and reacts with the influent, forming a dense floc. The floc may be removed by gravitational setting in a clarifier tank or basin, or by filtration. Water from the clarifier tank, basin, or sand filters may be routed through cartridge(s) and/or bag filters for final polishing. Vendor-specific systems use various methods of dose control, sediment/floc removal, filtration, etc., that are detailed in project-specific documentation. The particular coagulant/flocculant to be used for a given project is determined based on the water chemistry of the site because the coagulants are specific in their reactions with various types of sediments. Appropriate selection of dosage must be carefully matched to the characteristics of each site.

ATS's are operated in two differing modes, either Batch or Flow-Through. Batch treatment can be defined as Pump-Treat-Hold-Test-Release. In Batch treatment, water is held in a basin or tank, and is not discharged until treatment is complete. Batch treatment involves holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full. In Flow-Through treatment, water is pumped into the ATS directly from the runoff collection system or storm water holding pond, where it is treated and filtered as it flows through the system, and is then directly discharged. "Flow-Through Treatment" is also referred to as "Continuous Treatment."

1. Effluent Standards

This General Permit establishes NELs for discharges from construction sites that utilize an ATS. These systems lend themselves to NELs for turbidity and pH because of their known reliable treatment. Advanced systems have been in use in some form since the mid-1990s. An ATS is considered reliable, can consistently produce a discharge of less than 10 NTU, and has been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels.[19]

This General Permit contains "compliance storm event" exceptions from the technology-based NELs for ATS discharges. The rationale is that technology-based requirements are developed assuming a certain design storm. In the case of ATS the industry-standard design storm is 10-year, 24-hour (as stated in

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[17] RomØen, K., B. Thu, and Ø. Evensen. 2002. Immersion delivery of plasmid DNA II. A study of the potentials of a chitosan based delivery system in rainbow trout (*Oncorhynchus mykiss*) fry. *Journal of Controlled Release* **85**: 215-225.

[18] Bullock, G., V. Blazer, S. Tsukuda, and S. Summerfelt. 2000. Toxicity of acidified chitosan for cultured rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* **185**:273-280.

[19] Currier, B., G. Minton, R. Pitt, L. Roesner, K. Schiff, M. Stenstrom, E. Strassler, and E. Strecker. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.

Attachment F of this General Permit), so the compliance storm event has been established as the 10-year 24-hour event as well to provide consistency.

2. **Training**

Operator training is critical to the safe and efficient operation and maintenance of the ATS, and to ensure that all State Water Board monitoring and sampling requirements are met. The General Permit requires that all ATS operators have training specific to using ATS's liquid coagulants.

L. Post-Construction Requirements

Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment.

Construction activity can lead to impairment of beneficial uses in two main ways. First, during the actual construction process, storm water discharges can negatively affect the chemical, biological, and physical properties of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment, however pH and other non-visible pollutants are also of great concern. Second, after most construction activities are completed at a construction site, the finished project may result in significant modification of the site's response to precipitation. New development and redevelopment projects have almost always resulted in permanent post-construction water quality impacts because more precipitation ends up as runoff and less precipitation is intercepted, evapotranspired, and infiltrated.

General Permit 99-08-DWQ required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. An effective storm water management strategy must address the full suite of storm events (water quality, channel protection, overbank flood protection, extreme flood protection) (Figure 2).

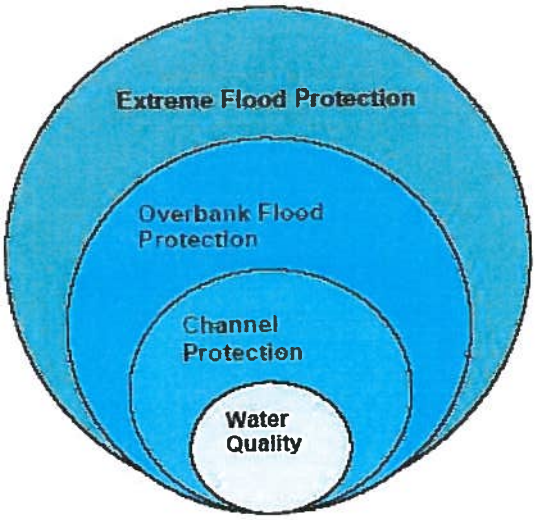

Figure 2 - Suite of Storm Events

The post-construction storm water performance standards in this General Permit specifically address water quality and channel protection events. Overbank flood protection and extreme flood protection events are traditionally dealt with in local drainage and flood protection ordinances. However, measures in this General Permit to address water quality and channel protection also reduce overbank and extreme flooding impacts. This General Permit aims to match post-construction runoff to pre-construction runoff for the 85th percentile storm event, which not only reduces the risk of impact to the receiving water's channel morphology but also provides some protection of water quality.

This General Permit clarifies that its runoff reduction requirements only apply to projects that lie outside of jurisdictions covered by a Standard Urban Storm water Management Plan (SUSMP) (or other more protective) post-construction requirements in either Phase I or Phase II permits.

Figures 3 and 4, below, show the General Permit enrollees (to Order 99-08-DWQ, as of March 10, 2008) overlaid upon a map with SUSMP (or more protective) areas in blue and purple. Areas without blue or purple indicate where the General Permit's runoff reduction requirements would actually apply.

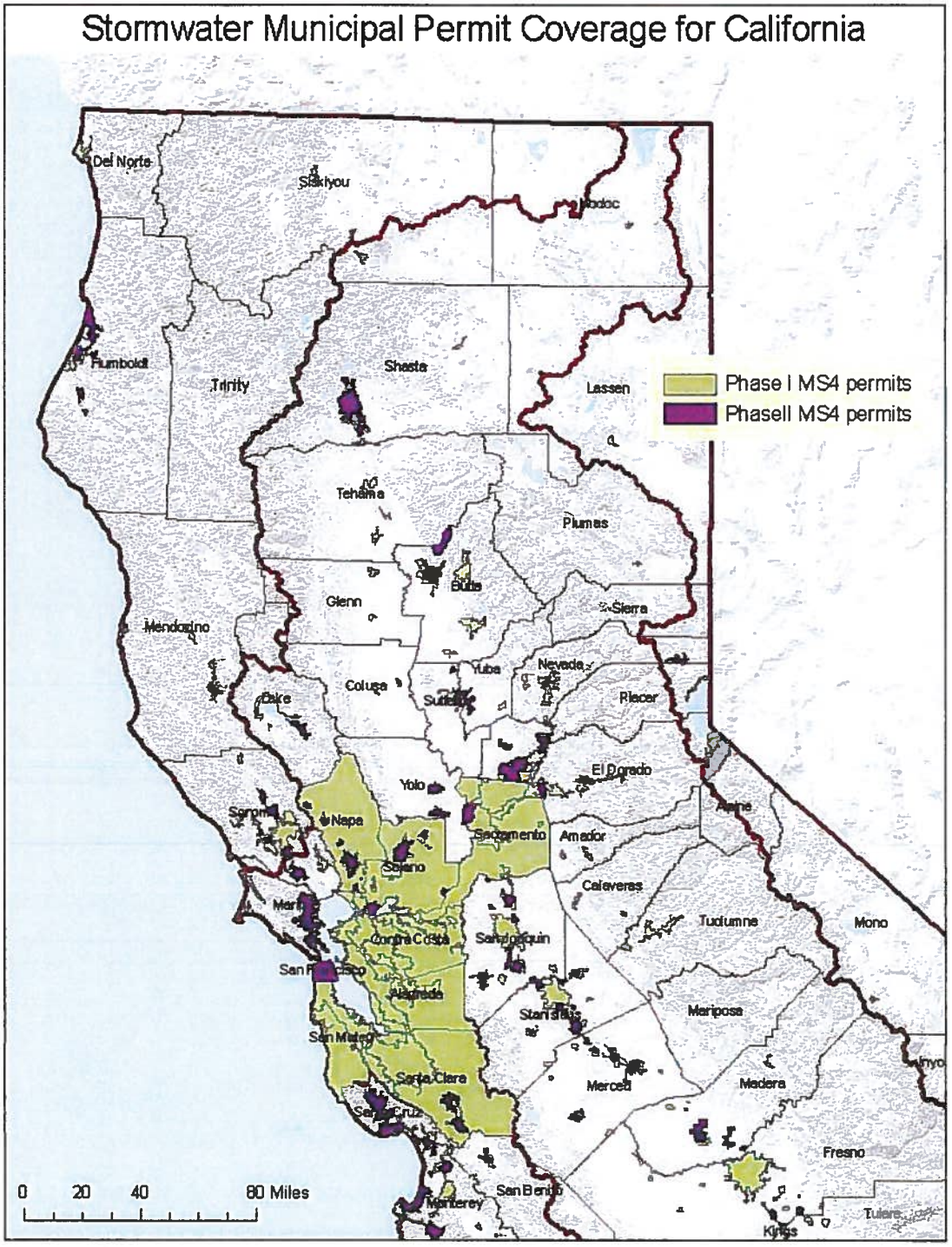

Figure 3 - Northern CA (2009) Counties / Cities With SUSMP-Plus Coverage

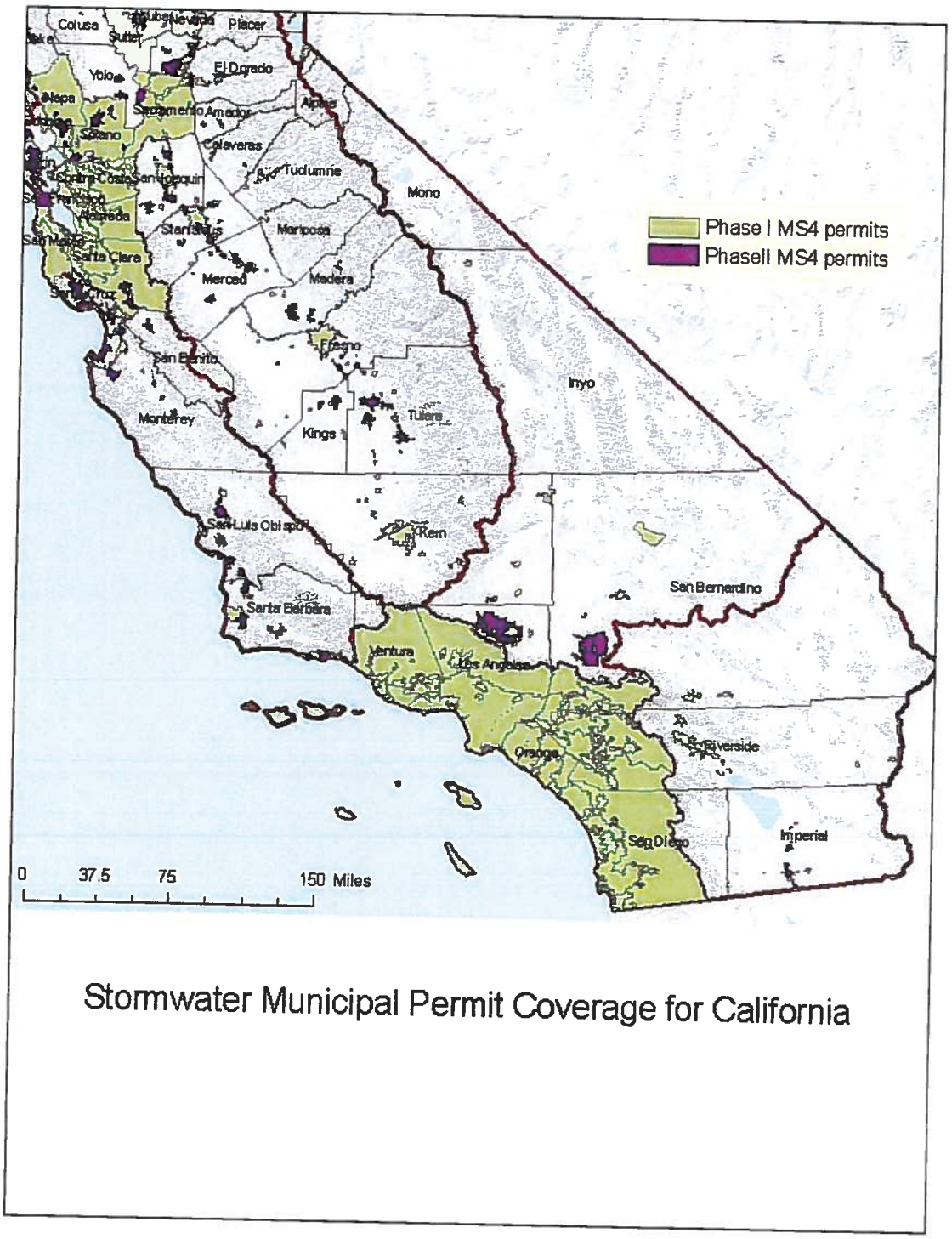

Figure 4 - Southern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Water Quality:
This General Permit requires dischargers to replicate the pre-project runoff water balance (defined as the amount of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event, or the smallest storm event that generates runoff, whichever is larger. Contemporary storm water management generally routes these flows directly to the drainage system, increasing pollutant loads and potentially causing adverse effects on receiving waters. These smaller water quality events happen much more frequently than larger events and generate much higher pollutant loads on an annual basis. There are other adverse hydrological impacts that result from not designing according to the site's pre-construction water balance. In Maryland, Klein[20] noted that baseflow decreases as the extent of urbanization increases. Ferguson and Suckling[21] noted a similar relation in watersheds in Georgia. On Long Island, Spinello and Simmons[22] noted substantial decreases in base flow in intensely urbanized watersheds.

The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapo-transpiration and infiltration through non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). Employing these measures close to the source of runoff generation is the easiest and most cost-effective way to comply with the pre-construction water balance standard. Using low-tech runoff reduction techniques close to the source is consistent with a number of recommendations in the literature.[23] In many cases, BMPs implemented close to the source of runoff generation cost less than end-of the pipe measures.[24] Dischargers are given the option of using Appendix 2 to calculate the required runoff volume or a watershed process-based, continuous simulation model such as the EPA's Storm Water Management Model (SWMMM) or Hydrologic Simulation Program Fortran (HSPF). Such methods used by the discharger will be reviewed by the Regional Water Board upon NOT application.

Channel Protection:
In order to address channel protection, a basic understanding of fluvial geomorphic concepts is necessary. A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge (1.5 to 2 year recurrence interval). The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels.[25] Lane (1955 as cited in Rosgen 1996[26]) showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope in

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[20] Klein 1979 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[21] Ferguson and Suckling 1990 as cited Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[22] Center for Watershed Protection (CWP). 2000. The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers, and estuaries. Ellicott City, MD. 741 pp.
[23] Bay Area Storm Water Management Agencies Association (BASMAA). 1997. Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality Protection. Palo Alto, CA;
McCuen, R.H. 2003 Smart Growth: hydrologic perspective. Journal of Professional Issues in Engineering Education and Practice. Vol (129), pp.151-154;
Moglen, G.E. and S. Kim. 2007. Impervious imperviousness-are threshold based policies a good idea? Journal of the American Planning Association, Vol 73 No. 2. pp 161-171.
[24] Delaware Department of natural Resources (DDNR). 2004. Green technology: The Delaware urban Runoff Management Approcah. Dover, DE. 117 pp.
[25] Dunne, T and L.B. Leopold. 1978. Water in Environmental Planning. San Francisco W.H. Freeman and Company
[26] Rosgen. D.L. 1996. Applied River Morphology. Pagosa Springs. Wildland Hydrology

Figure 5. A change in any one of these variables sets up a series of mutual adjustments in the companion variables with a resulting direct change in the physical characteristics of the stream channel.

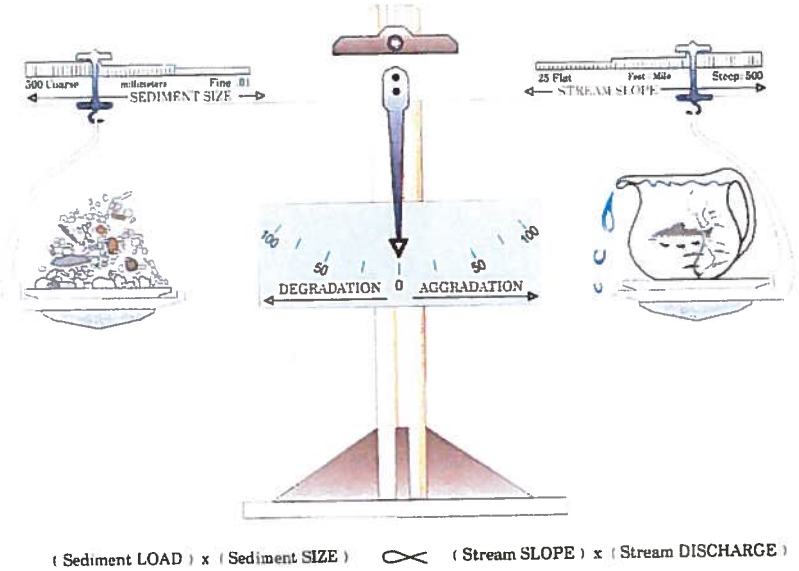

Figure 5 - Schematic of the Lane Relationship

After Lane (1955) as cited in Rosgen (1996)

Stream slope multiplied by stream discharge (the right side of the scale) is essentially an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (sediment load and sediment size represented on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels.[27] Most of this sediment is delivered to stream channels during large, episodic rain events.[28] This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et. al (1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 6).

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[27] Goldman S.J., K. Jackson, and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw Hill. San Francisco.

[28] Wolman 1967 as cited in Paul, M.P. and J.L. Meyer. 2001. Streams in the Urban Landscape. *Annu. Rev.Ecol. Syst.* 32: 333-365.

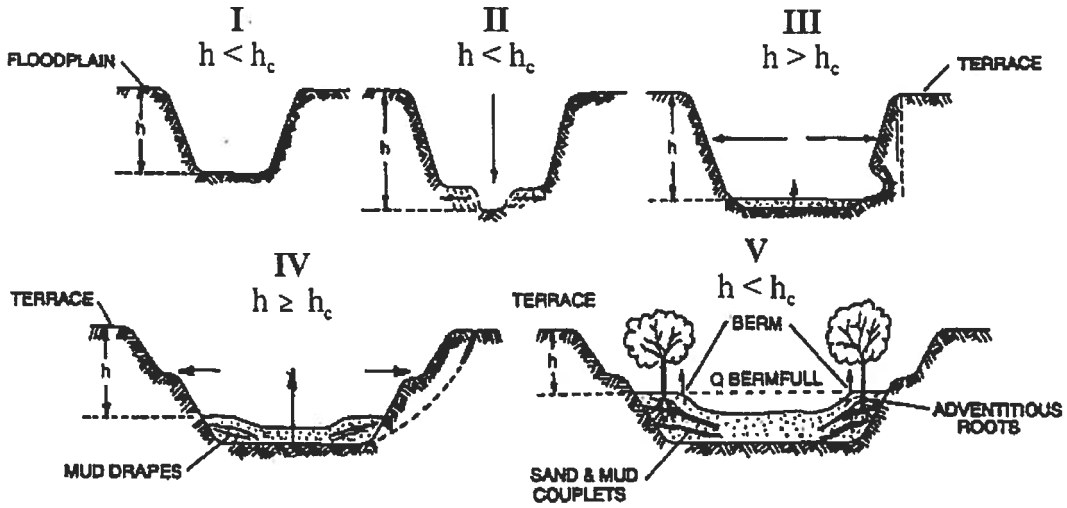

Figure 6 - Channel Changes Associated with Urbanization

After Incised Channel Evolution Sequence in Schumm et. al 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges.[29] Increased drainage density (miles of stream length per square mile of watershed) also negatively impacts receiving stream channels.[30] Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often "sediment starved" and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or d_{50}) decrease during urbanization.[31] This means

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[29] Booth, D. B. and C. R. Jackson. 1997. Urbanization of Aquatic Systems: Degradation Thresholds, Storm Water Detection, and the Limits of Mitigation. Journal of the American Water Resources Association Vol. 33, No.5, pp. 1077-1089.

[30] May, C.W. 1998. Cumulative effects of urbanization on small streams in the Puget Sound Lowland ecoregion. Conference proceedings from Puget Sound Research '98 held March 12, 13 1998 in Seattle, WA;
Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Hydromodification Management Plan Literature Review. 80 pp.

[31] Finkenbine, J.K., D.S. Atwater, and D.S. Mavinic. 2000. Stream health after urbanization. *J. Am. Water Resour. Assoc.* 36:1149-60;

that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant (provided they are non-cohesive).

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power [32]and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel. After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening.[33] At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution. Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies

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Pizzuto, J.E. W.S. Hession, and M. McBride. 2000. Comparing gravel-bed rivers in paired urban and rural catchments of southeastern Pennsylvania. *Geology* 28:79-82.

[32] Hammer 1973 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp;
Booth, D.B. 1990. Stream Channel Incision Following Drainage Basin Urbanization. *Water Resour. Bull.* 26:407-417.

[33] Trimble, S.W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed. *Science*: Vol. 278 (21), pp. 1442-1444.

must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein and Zaleski 2005).[34]

Traditional structural water quality BMPs (e.g. detention basins and other devices used to store volumes of runoff) unless they are highly engineered to provide adequate flow duration control, do not adequately protect receiving waters from accelerated channel bed and bank erosion, do not address post-development increases in runoff volume, and do not mitigate the decline in benthic macroinvertebrate communities in the receiving waters[35] suggest that structural BMPs are not as effective in protecting aquatic communities as a continuous riparian buffer of native vegetation. This is supported by the findings of Zucker and White[36], where instream biological metrics were correlated with the extent of forested buffers.

This General Permit requires dischargers to maintain pre-development drainage densities and times of concentration in order to protect channels and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

There are a number of other approaches for modeling fluvial systems, including statistical and physical models and simpler stream power models.[37] The use of these models in California is described in Stein and Zaleski (2005).[38] Rather than prescribe a specific one-size-fits-all modeling method in this permit, the State Water Board intends to develop a stream power and channel evolution model-based framework to assess channels and develop a hierarchy of suitable analysis methods and management strategies. In time, this framework may become a State Water Board water quality control policy.

Permit Linkage to Overbank and Extreme Flood Protection
Site design BMPs (e.g. rooftop and impervious disconnection, vegetated swales, setbacks and buffers) filter and settle out pollutants and provide for more infiltration than is possible for traditional centralized structural BMPs placed at the lowest point in a site. They provide source control for runoff and lead to a reduction in pollutant loads. When implemented, they also help reduce the magnitude and volume of larger, less frequent storm events (e.g., 10-yr, 24-hour storm and larger), thereby reducing the need for expensive flood control infrastructure. Nonstructural BMPs can also be a landscape amenity, instead of a large isolated structure requiring substantial area for ancillary access, buffering, screening and maintenance facilities.[25] The multiple benefits of using non-structural benefits will be critically important as the state's population increases and imposes strains upon our existing water resources.

Maintaining predevelopment drainage densities and times of concentration will help reduce post-development peak flows and volumes in areas not covered under a municipal permit. The most effective way to preserve drainage areas and maximize time of concentration is to implement landform grading,

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[34] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.
[35] Horner, R.R. 2006. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (LID) for the San Diego Region. Available at: http://www.projectcleanwater.org/pdf/permit/case-study_lid.pdf.
[36] Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[37] Finlayson, D.P. and D.R. Montgomery. 2003. Modeling large-scale fluvial erosion in geographic information systems. Geomorphology (53), pp. 147-164).
[38] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

incorporate site design BMPs and implement distributed structural BMPs (e.g., bioretention cells, rain gardens, rain cisterns).

M. Storm Water Pollution Prevention Plans

USEPA's Construction General Permit requires that qualified personnel conduct inspections. USEPA defines qualified personnel as "a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity."[39] USEPA also suggests that qualified personnel prepare SWPPPs and points to numerous states that require certified professionals to be on construction sites at all times. States that currently have certification programs are Washington, Georgia, Florida, Delaware, Maryland, and New Jersey. The Permit 99-08-DWQ did not require that qualified personnel prepare SWPPPs or conduct inspections. However, to ensure that water quality is being protected, this General Permit requires that all SWPPPs be written, amended, and certified by a Qualified SWPPP Developer. A Qualified SWPPP Developer must possess one of the eight certifications and or registrations specified in this General Permit and effective two years after the adoption date of this General Permit, must have attended a State Water Board-sponsored or approved Qualified SWPPP Developer training course. Table 9 provides an overview of the criteria used in determining qualified certification titles for a QSD and QSP.

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39 US Environmental Protection Agency. Stormwater Pollution Prevention Plans for Construction Activities. <http://cfpub.epa.gov/npdes/stormwater/swppp.cfm> and <http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf>.

Table 9 - Qualified SWPPP Developer/ Qualified SWPPP Practitioner Certification Criteria

Certification/ Title	Registered By	QSD/QSP	Certification Criteria
Professional Civil Engineer	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Geologist or Engineering Geologist	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Landscape Architect	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Hydrologist	American Institute of Hydrology	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Certified Professional in Erosion and Sediment Control™ (CPESC)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Inspector of Sediment and Erosion Control™ (CISEC)	Certified Inspector of Sediment and Erosion Control, Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Erosion, Sediment and Storm Water Inspector™ (CESSWI)	Enviro Cert International Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Professional in Storm Water Quality™ (CPSWQ)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education

The previous versions of the General Permit required development and implementation of a SWPPP as the primary compliance mechanism. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The SWPPP must include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

This General Permit shifts some of the measures that were covered by this general requirement to specific permit requirements, each individually enforceable as a permit term. This General Permit emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities. These specific requirements also improve both the clarity and the enforceability of the General Permit so that the dischargers understand, and the public can determine whether the discharges are in compliance with, permit requirements.

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the General Permit. For LUPs the discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. Once construction activities are complete, until stabilization is achieved, the SWPPP shall be available from the SWPPP contact listed in the PRDs

A SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs needed to address all possible generated pollutants

N. Regional Water Board Authorities

Because this General Permit will be issued to thousands of construction sites across the State, the Regional Water Boards retain discretionary authority over certain issues that may arise from the discharges in their respective regions. This General Permit does not grant the Regional Water Boards any authority they do not otherwise have; rather, it merely emphasizes that the Regional Water Boards can take specific actions related to this General Permit. For example, the Regional Water Boards will be enforcing this General Permit and may need to adjust some requirements for a discharger based on the discharger's compliance history.

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

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Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE
ACTIVITIES

ORDER NO. 2009-0009-DWQ
NPDES NO. **CAS000002**

This Order was adopted by the State Water Resources Control Board on:	**September 2, 2009**
This Order shall become effective on:	**July 1, 2010**
This Order shall expire on:	**September 2, 2014**

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

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Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2010-0014-DWQ
NPDES NO. CAS000002

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2009-0009-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on:	**November 16, 2010**
This Order shall become effective on:	**February 14, 2011**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010.**

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ
NPDES NO. **CAS000002**

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2010-0014-DWQ became effective on:	**February 14, 2011**
Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, was adopted by the State Water Resources Control Board on:	**July 17, 2012**
This Order No. 2012-0006-DWQ shall become effective on:	**July 17, 2012**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

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STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2009-0009-DWQ
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT NO. CAS000002

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH
CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

I. FINDINGS

A. General Findings

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.

2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.

4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.

5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.

6. Pursuant to 40 C.F.R. § 131.12 and State Water Board Resolution No. 68-16,[1] which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.

7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.

8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.

9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

[1] Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.

10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.

12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.

13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.

14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.

15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.

16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.

17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

B. Activities Covered Under the General Permit

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.

21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[2]

23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

[2] Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

C. Activities Not Covered Under the General Permit

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.

28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

29. Construction activity covered by an individual NPDES Permit for storm water discharges.

30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 ("R" in the Revised Universal Soil Loss Equation).

31. Landfill construction activity that is subject to the Industrial General Permit.

32. Construction activity that discharges to Combined Sewer Systems.

33. Conveyances that discharge storm water runoff combined with municipal sewage.

34. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

D. Obtaining and Modifying General Permit Coverage

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.

37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and No. 2003-0007-DWQ. For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

E. Prohibitions

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)[3]. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.

42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

43. This General Permit prohibits the discharge of any debris[4] from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

F. Training

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.

45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

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[3] BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

[4] Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

G. Determining and Reducing Risk

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.

47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.

48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.

49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.

50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS[5]) can prevent or reduce the release of fine particles from construction sites.

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[5] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

H. Effluent Standards

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, "The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities," dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel's suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

Determining Compliance with Numeric Limitations

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.

54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

I. Receiving Water Limitations

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

J. Sampling, Monitoring, Reporting and Record Keeping

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.

57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.

58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.

59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.

60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.

61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.

63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.

64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.

65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.

66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

K. Active Treatment System (ATS) Requirements

67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.

68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.

69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.

70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

L. Post-Construction Requirements

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board Resolution No. 2005-0006, "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and 2008-0030, "Requiring Sustainable Water Resources Management." The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This "runoff reduction" approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.

73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

M. Storm Water Pollution Prevention Plan Requirements

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.

75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

N. Regional Water Board Authorities

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

IT IS HEREBY ORDERED that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)[6]:

II. CONDITIONS FOR PERMIT COVERAGE

A. Linear Underground/Overhead Projects (LUPs)

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.

3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

[6] These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

B. Obtaining Permit Coverage Traditional Construction Sites

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.

2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

3. PRDs shall consist of:

   a. Notice of Intent (NOI)
   b. Risk Assessment (Section VIII)
   c. Site Map
   d. Storm Water Pollution Prevention Plan (Section XIV)
   e. Annual Fee
   f. Signed Certification Statement

   Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

   Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.

   a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.

   b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.

6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.

7. Small Construction Rainfall Erosivity Waiver

   EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

   Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

   If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the

rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. Revising Permit Coverage for Change of Acreage or New Ownership

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.

2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:

   a. A revised NOI indicating the new project size;

   b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.

   c. SWPPP revisions, as appropriate; and

   d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.

   e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved "Final Stabilization" as defined in Section II.D.

4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit's requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP's approved signatory, must submit PRDs in accordance with this General Permit's requirements.

D. Conditions for Termination of Coverage

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:

   a. For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

   b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

   c. Final stabilization has been reached;

   d. Construction materials and wastes have been disposed of properly;

   e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;

   f. Post-construction storm water management measures have been installed and a long-term maintenance plan[7] has been established; and

   g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

[7] For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.

2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.

3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:

   a. "70% final cover method," no computational proof required

      OR:

   b. "RUSLE or RUSLE2 method," computational proof required

      OR:

   c. "Custom method", the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.

III. DISCHARGE PROHIBITIONS

A. Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

B. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.

C. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;

2. The discharge does not violate any other provision of this General Permit;

3. The discharge is not prohibited by the applicable Basin Plan;

4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.

5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;

6. The discharge is monitored and meets the applicable NALs; and

7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

D. Debris resulting from construction activities are prohibited from being discharged from construction sites.

E. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

IV. SPECIAL PROVISIONS

A. Duty to Comply

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

B. General Permit Actions

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

D. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

F. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

G. Duty to Maintain Records and Provide Information

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.

2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

H. Inspection and Entry

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

I. Electronic Signature and Certification Requirements

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.

3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

J. Certification

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

K. Anticipated Noncompliance

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

L. Bypass

Bypass[8] is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;[9]

2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;

3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or

4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

M. Upset

1. A discharger that wishes to establish the affirmative defense of an upset[10] in an action brought for noncompliance shall demonstrate,

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[8] The intentional diversion of waste streams from any portion of a treatment facility

[9] Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

[10] An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the discharger can identify the cause(s) of the upset

b. The treatment facility was being properly operated by the time of the upset

c. The discharger submitted notice of the upset as required; and

d. The discharger complied with any remedial measures required

2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.

3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

N. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

O. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

P. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

Q. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

R. Penalties for Violations of Permit Conditions

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[11] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

S. Transfers

This General Permit is not transferable.

T. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

[11] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		Risk Level 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2	1	NTU	250 NTU
		Risk Level 3			250 NTU

B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.

3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

   a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

      AND/OR:

   b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

C. Receiving Water Monitoring Triggers

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[12] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

---

2. Risk Level 3 dischargers with with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.

3. Risk Level 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

[12] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

VI. RECEIVING WATER LIMITATIONS

A. The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

B. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

C. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

D. Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

   a. A California registered professional civil engineer;

   b. A California registered professional geologist or engineering geologist;

   c. A California registered landscape architect;

   d. A professional hydrologist registered through the American Institute of Hydrology;

   e. A Certified Professional in Erosion and Sediment Control (CPESC) ™ registered through Enviro Cert International, Inc.;

   f. A Certified Professional in Storm Water Quality (CPSWQ) ™ registered through Enviro Cert International, Inc.; or

   g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or

   b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.

5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,[13] the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

IX. RISK LEVEL 1 REQUIREMENTS

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

X. RISK LEVEL 2 REQUIREMENTS

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

XI. RISK LEVEL 3 REQUIREMENTS

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

XII. ACTIVE TREATMENT SYSTEMS (ATS)

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

[13] Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres http://cain.ice.ucdavis.edu/calwater/calwfaq.html, http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175 .

Exhibit C

Yucaipa Valley Water District

12770 Second Street, Yucaipa, California 92399

2010 Urban Water Management Plan

Board of Directors

Ian Cuthbertson	Bruce Granlund	Jay Bogh	Lonni Granlund	Hank Wochholz
Division 1	Divisions 2	Division 3	Division 4	Division 5

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Section 1

Preparation of the 2010 Urban Water Management Plan

1.1 Purpose of an Urban Water Management Plan

An Urban Water Management Plan (UWMP) is prepared by a water purveyor to ensure the appropriate level of reliability in water service is sufficient to meet the needs of its various categories of customers over a 20-year planning horizon during normal, dry, and multiple dry years.

The California Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6: Urban Water Management Planning, Sections 10610 to 10656 is attached as Appendix A) is based upon the following declarations as set forth by the California Legislature:

(1) The waters of the state are limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service is sufficient to meet the needs of its various categories of customers during normal, dry and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water sources.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

In addition, the Water Conservation Bill of 2009 requires urban water suppliers to report baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use. Changes to California law require that, beginning in 2016, water suppliers comply with water conservation requirements established by the Water Conservation Bill of 2009 in order to be eligible for State water grants and loans.

The Yucaipa Valley Water District's 2010 Urban Water Management Plan has been prepared in compliance with the requirements of the California Urban Water Management Planning Act and the Water Conservation Bill of 2009.

1.2 Urban Water Management Plan Update Preparation

On July 16, 2007, the Yucaipa Valley Water District received notification from the Department of Water Resources that the 2005 Urban Water Management Plan was complete. This Plan is an update of the previously approved Plan with additional documentation required by the Department of Water Resources.

The 2010 Plan describes and evaluates the District's water supply sources, the efficient uses of that water supply, demand management measures with an implementation strategy and schedule, and other relevant information and programs. The 2010 UWMP is organized as follows:

- **Section 1 - Preparation of the 2010 Urban Water Management Plan -** This section describes the coordination between various agencies, as well as the adoption, submittal and implementation of the Plan.
- **Section 2 - Overview of the Yucaipa Valley Water District -** This section describes the service area and the population of the District.
- **Section 3 - Water System Demands -** This section provides baselines and targets for the District and water demand projections.
- **Section 4 - Water Sources and Supplies -** This section includes a description of water sources, groundwater, imported water, recycled water and water transfer opportunities
- **Section 5 - Water Supply Reliability Planning and Water Shortage Contingency Plan -** This section describes the steps the District has taken to provide a long-term, robust and reliable water supply for our customers.
- **Section 6 - Water Demand Management Measures -** This section provides a comprehensive description of the water conservation programs that are currently implemented and those that are planned to be implemented.
- **Section 7 - Climate Change -** This section provides information about potential climate change impacts on water supplies.

Specific information required by the California Urban Water Management Planning Act is cited in the Plan in italic font at the start of each relevant section. Following the reference citation, the text of the Plan responding to those requirements is provided.

1.3 Urban Water Management Plan Coordination

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable (California Water Code Section 10620(d)(2)).

The Yucaipa Valley Water District actively participated in the preparation of the Regional Urban Water Management Plans by our water wholesale agencies - the San Gorgonio Pass Water Agency and the San Bernardino Valley Municipal Water District.

Additionally, the Yucaipa Valley Water District had an opportunity to review other local Urban Water Management Plans as part of the preparation of the regional planning documents and the District also hosted a review meeting with other local water retailers.

Table 1-1 - Coordination with Appropriate Agencies

Coordinating Agencies	Participated in preparing the UWMP	Was sent a copy of the draft UWMP	Commented on the draft UWMP	Attended public meetings	Was sent a notice of intention to adopt	Was sent a final copy of the UWMP
San Bernardino Valley Municipal Water District	X	X		X	X	X
San Gorgonio Pass Water Agency		X	X	X	X	X
Beaumont-Cherry Valley Water District		X		X	X	X
East Valley Water District		X			X	X
South Mesa Water Company		X			X	X
Western Heights Water Company		X	X		X	X
City of Banning		X		X	X	X
City of Beaumont		X			X	X
City of Calimesa		X			X	X
City of Redlands		X			X	X
City of San Bernardino		X			X	X
City of Yucaipa	X	X	X		X	X
California Regional Water Quality Control Board, Santa Ana Region		X			X	X
California Department of Public Health		X			X	X
County of Riverside		X			X	X
County of San Bernardino		X			X	X

Table 1-1 - Coordination with Appropriate Agencies

Coordinating Agencies	Participated in preparing the UWMP	Was sent a copy of the draft UWMP	Commented on the draft UWMP	Attended public meetings	Was sent a notice of intention to adopt	Was sent a final copy of the UWMP
Riverside Local Agency Formation Commission (LAFCO)		X		X	X	X
San Bernardino Local Agency Formation Commission (LAFCO)		X	X		X	X
Yucaipa-Calimesa Joint Unified School District		X			X	X
Crafton Hills College		X			X	X
Inland Empire Resource Conservation District		X			X	X
United States Forest Service		X	X		X	X

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision (California Water Code Section 10621(b)).

On February 10th, 2011, the District sent notices to the agencies listed above.

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within it provides water supplies no later than 60 days after the submission of its urban water management plan (California Water Code Section 10635(b)).

Following the final preparation of the Plan, the District will be sending copies of the final plan to the following entities:

- City of Calimesa
- City of Yucaipa
- County of Riverside
- County of San Bernardino

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan (California Water Code Section 10642).

As provided in Table 1-1 above, the Yucaipa Valley Water District has reached out to other groups within our service area to ensure our Plan is complete and consistent with available information. These additional groups include:

- Crafton Hills College
- Yucaipa - Calimesa Joint Unified School District

- Inland Empire Resource Conservation District
- United States Forest Service

Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area (California Water Code Section 10642).

The District has made data and portions of the Plan available to the imported water wholesale agencies -- the San Gorgonio Pass Water Agency and the San Bernardino Valley Municipal Water District to maximize our coordination. Prior to adoption of the Plan, the document was available on the District website (www.yvwd.dst.ca.us) and at the District office. A copy of the public notice is defined below.

NOTICE OF PUBLIC HEARING
YUCAIPA VALLEY WATER DISTRICT
2010 URBAN WATER MANAGEMENT PLAN AND THE
2010 SAN BERNARDINO VALLEY REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that on June 15th, 2011 at 6:00 p.m., in the meeting room of the Board of Directors of the Yucaipa Valley Water District at 12770 Second Street, Yucaipa, California 92399, the Board of Directors will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider and receive comments and input on the *2010 Yucaipa Valley Water District Urban Water Management Plan and the 2010 San Bernardino Valley Regional Urban Water Management Plan*, to allow community input regarding the Yucaipa Valley Water District implementation plan for complying with Part 2.55 of the Water Code, to consider the potential economic impacts of the implementation plan, and to adopt a method pursuant to Water Code section 10608.20(b) for determining the Yucaipa Valley Water District's urban water use targets.

A copy of the *Draft 2010 Yucaipa Valley Water District Urban Water Management Plan* is currently available for public review. The *San Bernardino Valley Regional Urban Water Management Plan* will be available for public review on or before June 1, 2011. Both documents will be available Monday through Friday, during normal business hours at the Yucaipa Valley Water District's Administrative Office located at 12770 Second Street, Yucaipa, California 92399. In addition, an electronic version of the *Draft Yucaipa Valley Water District Urban Water Management Plan and the San Bernardino Valley Regional Urban Water Management Plan* will be accessible at the District website at www.yvwd.dst.ca.us. In summary, the *2010 Yucaipa Valley Water District Urban Water Management Plan and 2010 San Bernardino Valley*

Regional Urban Water Management Plan has been developed for implementation in accordance with the requirements of the California Urban Water Management Planning Act, Water Code sections 10610 through 10657, and the Water Conservation Act of 2009, Water Code sections 10608 through 10608.64. Public input from diverse social, cultural and economic elements of the population is encouraged and will be considered as part of the urban water management planning process. Input from and coordination with the Counties of San Bernardino and Riverside, cities within which the Yucaipa Valley Water District provides water supplies and other public agencies is also encouraged and will be considered. (Water Code §§ 10620(d)(2); 10621(b); 10642.) Any written comments regarding the *Draft 2010 Yucaipa Valley Water District Urban Water Management Plan and the 2010 San Bernardino Valley Regional Urban Water Management Plan* should be submitted by the close of business on June 8th, 2011 to the address set forth above, attention Jennifer Ares. Public comments can also be made at the public hearing at the time and place first set forth above. Upon conclusion of the public hearing, the Board of Directors of the Yucaipa Valley Water District may revise, change, modify, and/or adopt the *2010 Yucaipa Valley Water District Urban Water Management Plan and the San Bernardino Valley Regional Urban Water Management Plan.* Questions regarding the public hearing or the 2010 Urban Water Management Plan's should be directed to Jennifer Ares at (909)-790-3301. If you are disabled in any way and need accommodation to participate in the public hearing, please call Chelsie Fogus at (909)-797-5118 for assistance at least two working days prior to the hearing so the necessary arrangements can be made.

1.4 Urban Water Management Plan Adoption, Submittal and Implementation

The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with California Water Code Section 10640) (California Water Code Section 10621(c)).

Following the adoption of the Plan, if there are changes needed, the District will be conducting another public hearing to provide an opportunity for additional input from our stakeholders.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing (California Water Code Section 10642) and an urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan (California Water Code Section 10643).

The District has adopted this Urban Water Management Plan as Resolution No. 11-2011. A copy of this resolution is included as Appendix D. The implementation of this Plan will be largely dependent on growth estimates, water supply assumptions and water demand projections. While the variability of these factors, and others, will make this Plan a "living document" reflecting economic issues, political changes and societal pressures, the District intends to follow the implementation planning within this document at the time of its preparation.

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies

a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption (California Water Code Section 10644(a)).

Within 30 days after the adoption of this Plan, the District will submit copies to the following agencies:

- California Department of Water Resources;
- California State Library;
- City of Calimesa;
- City of Yucaipa;
- County of Riverside; and the
- County of San Bernardino.

Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours. (California Water Code Section 10645).

Following the adoption of the Plan, the District will make a copy of the Urban Water Management Plan available for review on our website and at the District office.

Section 2

Overview of the Yucaipa Valley Water District

2.1 A Brief History of the Yucaipa Valley

At the time of the earliest European contact, the Yucaipa Valley was inhabited by a tribe of Indians called "Serrano" ("mountaineer") by the Spaniards who first encountered them in the 18th century. This is not the name the Indians held for themselves; their precise name is not known, due to the many translations that exist today. Yucaipaiem, Yucaipe, and Yucaipat are among the names associated with the tribe. All of these names refer to "wet lands" which suitably characterized the Yucaipa Valley at the time. An abundance of water from higher elevations contributed to many natural streams and springs, combined with a mild climate and ample food resources, endowed the Yucaipa Valley with the elements necessary for the survival of this nomadic tribe.

Figure 2-1 - San Gabriel Mission by Ferdinand Deppe

With the establishment of the San Gabriel Mission (located in Los Angeles) in 1771, European settlement of the area began. In 1819, the San Bernardino de Sena Estancia was constructed as the influence of the Spanish missions moved inland towards the Yucaipa Valley. Spanish missionaries introduced the principle of irrigation with the first irrigation ditch -- the Mill Creek Zanja -- built in 1819 by the Indians. This water improvement allowed for increased farming and cattle raising in the area and opened the way for increased settlements.

The Mission period ended with the Act of Secularization in 1833, which began the Rancho period and involved the granting of large tracts of land to Mexican officials in exchange for services rendered during the Mexican revolution. This initiated a period of the Ranchos, during which time grazing and agricultural development continued to grow. Irrigation efforts also expanded, bringing water from Yucaipa's year-round streams and springs to drier sites in the vicinity.

Yucaipa's agricultural period continued to expand and thrive through its transition from Mexican to American ownership. By the twentieth century, farming interests included the cultivation of

peaches, plums, and other orchard fruits. Water pipelines transported water from Potato Canyon (in the Oak Glen area) to what is now western Yucaipa.

As development in Yucaipa, Redlands and surrounding communities expanded, the provision of water became a more critical issue. Disagreements began to occur, concerning the exportation of water from the area. This issue erupted into a lawsuit in 1909, the outcome of which had two effects: (1) Redlands' South Mountain Water Company was limited to the amount of water it could extract from Potato Canyon; and (2) the Yucaipa Land and Water Company conceded to Redlands limited rights to extract water from certain sites in Yucaipa. At this time, approximately 95% of the area's water supply was used for irrigation purposes.

Other actions in the early 1900s included the formation of several mutual water companies, some still in operation today. By the 1950s, post-World War II development pressures brought increased urbanization to the Yucaipa area. Agricultural production decreased from the farming and ranching activities of the prior decades.

From the 1960s to the present urbanization trends have increased throughout the San Bernardino and Riverside areas, earning the nickname "Inland Empire" for the entire region. Yucaipa, as part of the Inland Empire, has historically experienced similar growth pressures. However, limited water supplies and water quality regulations imposed on the septic systems in the 1980s by the Santa Ana Regional Water Quality Control Board significantly reduced the growth of the Yucaipa Valley as compared to other Inland Empire communities.

Documents cited and additional resources to explore:

- *Yucaipa Valley, California: a saga of ordinary people with extra-ordinary dreams, Morse G. Archer, 1976.*
- *Between the Coast and the Desert, Archaeological Data Recovery at the Yukaipa't Site, CA-SBR-1000, Yucaipa, California, Donn R. Grenda, 1998.*

2.2 The Formation of the Yucaipa Valley Water District

While the Yucaipa Valley Water District has a long lineage and history of water operations in the Yucaipa Valley, the Yucaipa Valley Water District was formed as part of a reorganization, pursuant to the Reorganization Act of 1965, being Division I of Title 6 of the Government Code of the State of California. This reorganization consisted of the dissolution of the Calimesa Water Company and formation of Improvement District No. 1 of the District as successor-in-interest thereto, and the dissolution of Improvement District "A" of the San Bernardino Valley Municipal Water District and the formation of Improvement District "A" of the District as successor-in-interest thereto. On September 14, 1971, the Secretary of State of the State of California certified and declared the formation of the District.

The District operates under the County Water District Law, being Division 12 of the State of California Water Code. Although the immediate function of the District at the time was to provide water service, the Yucaipa Valley Water District currently provides a variety of services to residential, commercial and industrial customers. These services include:

- Potable Water Service;
- Drinking Water Treatment;
- Recycled Water Service;
- Sewer Collection;
- Sewer Treatment; and
- Salinity Elimination.

2.3 The Yucaipa Valley Water District Service Area

Describe the service area of the supplier (California Water Code Section 10631(a)).

As shown below in Figure 2-2, Yucaipa Valley Water District is located in the upper portion of the Santa Ana Watershed approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego.

Figure 2-2 – Yucaipa Valley Water District Location Map

The Yucaipa Valley Water District is located in a high elevation valley at the base of the San Bernardino Mountain Range. The District's primary service area ranges in elevation from a low elevation of 2,044 feet above sea level to a high elevation of 5,184 feet above sea level. The range in elevation of 3,140 feet within the District's service area requires the District to provide water service from 18 separate pressure zones.

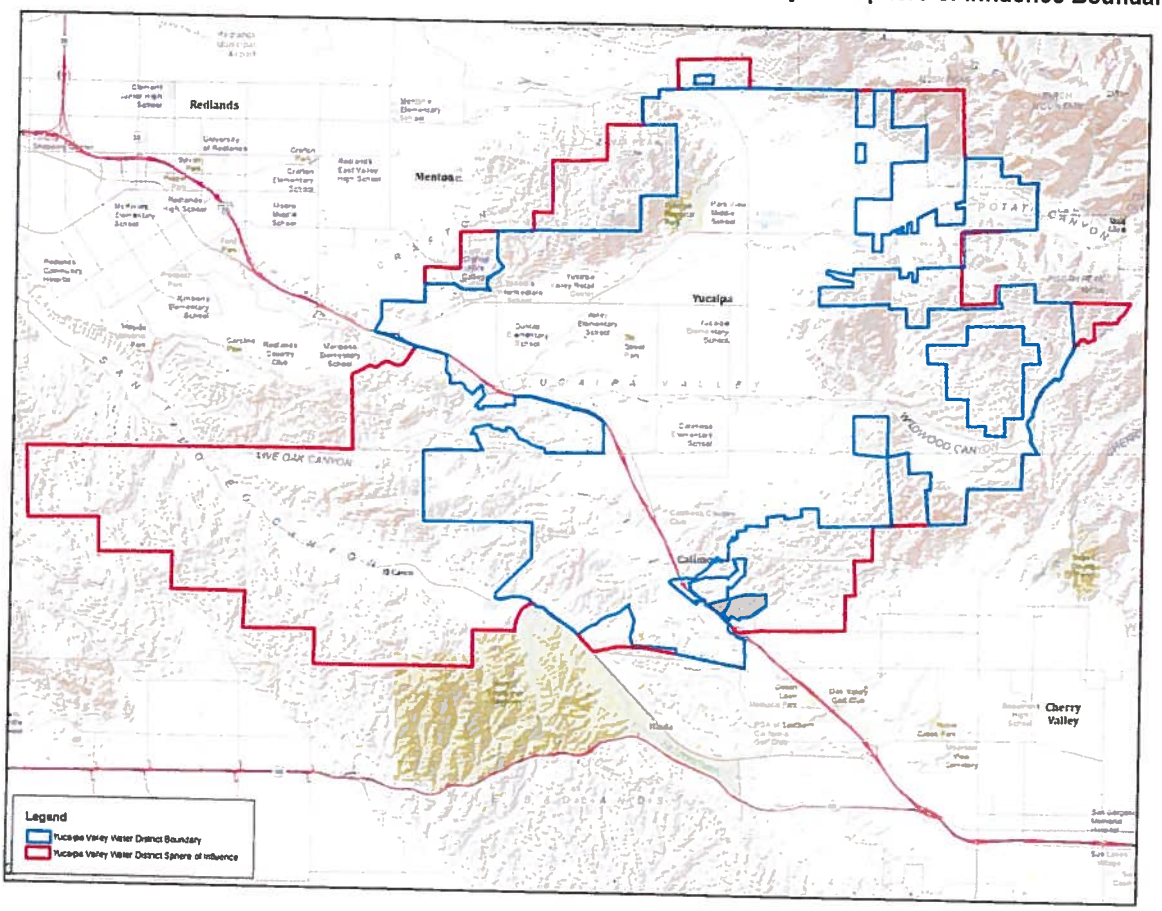
However, the future service area of the Yucaipa Valley Water District is more accurately depicted by the District's sphere of influence which ranges in elevation from 1,555 feet above sea level to 5,455 feet above sea level. This elevation difference of 3,900 feet produces a wide variety of climatic differences and various natural life zones throughout the area.

Table 2-1 Boundary Summary for Yucaipa Valley Water District

	Yucaipa Valley Water District Boundary Comparison	
	Sphere of Influence	Service Area
Minimum Elevation	1,555 feet above sea level	2,044 feet above sea level
Maximum Elevation	5,455 feet above sea level	5,184 feet above sea level
Elevation Range	3,900 feet	3,140 feet
Land Area	68 square miles (43,525 acres)	40 square miles (25,742 acres)

The District serves the residents of the City of Calimesa and the City of Yucaipa. Neighboring cities include the City of Redlands and the City of Beaumont.

Figure 2-3 – Yucaipa Valley Water District Service Area Boundary and Sphere of Influence Boundary



The diagram above illustrates the difference between the Yucaipa Valley Water District's current service area boundary (dark pink) and the current sphere of influence boundary (light pink). For the purpose of this report, the projected water demands and supply sources will be based on the sphere of influence as provided above. This boundary most appropriately represents the ultimate planning area of the Yucaipa Valley Water District.

2.3.1 Drainage Patterns within the Yucaipa Valley Water District

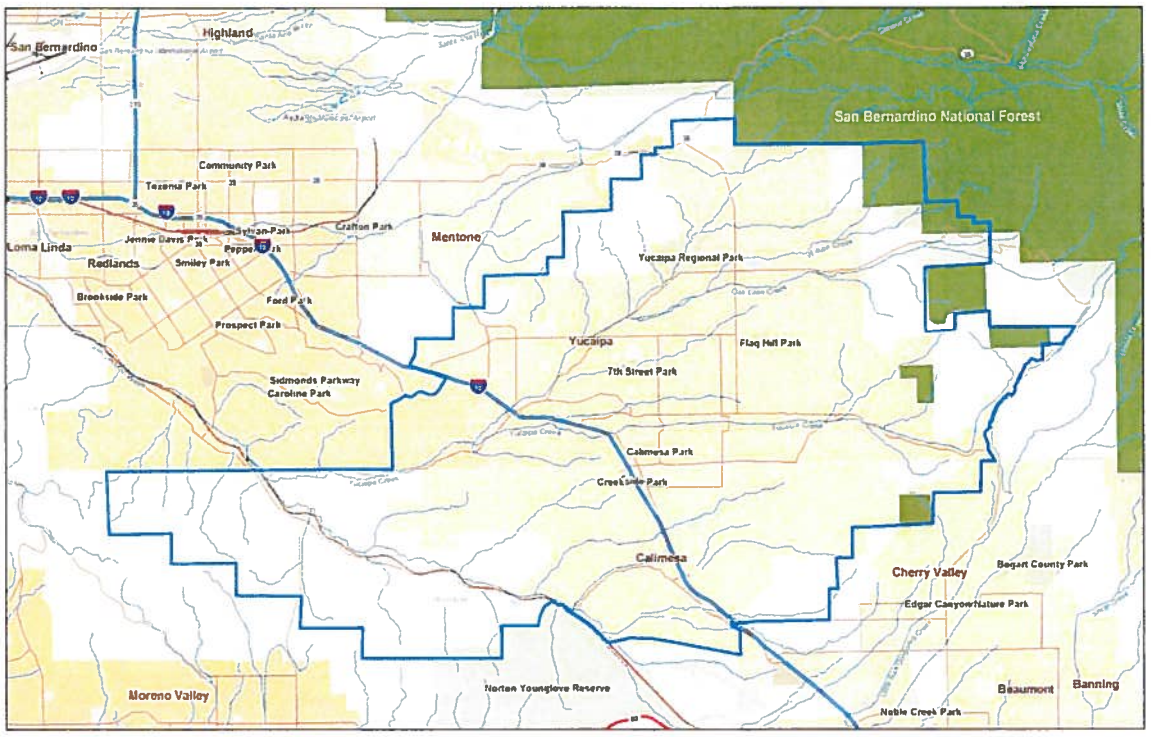
The watershed of the Yucaipa Valley extends from the crest of the Crafton Hills in the northwest, to the crest of the Yucaipa Ridge of the San Bernardino Mountains to the northeast, and the Yucaipa Hills in the southeast to the Badlands of San Timoteo Canyon to the southwest. Drainage in the area is by many small ephemeral creeks including: Yucaipa Creek, Oak Glen Creek, Wilson Creek, Birch Creek, and San Timoteo Creek. These creeks all begin in the upland areas to the northeast and drain down to the southwest through Live Oak Canyon to San Timoteo Creek which is a tributary of the Santa Ana River.

Stream gauge data and observations by District staff reveal that the creeks are generally dry during most of the year except along their upland reaches where small, sustained year-round flows may occur. Irregular flows do occur occasionally along the entire reach of the creeks during both high intensity summer cloudbursts and long duration seasonal winter storms. In both cases, the stream flows generated from these conditions tend to be very flashy, with water levels changing rapidly over time and large amounts of unconsolidated sediments being scoured from the upper reaches and washed downstream. The largest volume of these flow events occur during the winter storm season from November through April.

The surface area within the Yucaipa Valley Water District drains to San Timoteo Creek in the lower southwest portion of the District planning area. Figure 2-3 shows the major drainage courses within the planning area as identified in the General Plan of the City of Yucaipa and the City of Calimesa.

The main tributaries in the sphere of influence of the Yucaipa Valley Water District are considered relatively small by comparison to the Santa Ana River and Mill Creek directly to the north of the District. Drainage courses in the boundary of the Yucaipa Valley Water District include Wilson Creek, Oak Glen Creek, Yucaipa Creek, and San Timoteo Wash.

Figure 2-4 - Drainage Areas within the Yucaipa Valley Water District Service Area



2.3.2 Hydrogeology of the Yucaipa Valley

The Yucaipa Valley is a sediment-filled depression created by differential uplift and erosion of crystalline rock masses along complex fault traces. The basin is one of several which are located within a wedge shaped portion of the earth's crust called the San Bernardino Valley block, which is bounded by two major northwest trending faults, the San Andreas and the San Jacinto. This area is located within the Transverse Range Physiographic Province of California and is bordered on the east by the San Bernardino Mountains.

The geological structure of the area includes the essentially non-water-bearing crystalline basement rock, which underlies and surrounds the basin, and three unconsolidated units of water-bearing sediments comprising the groundwater basin; the San Timoteo Formation, the Older Alluvium, and the Younger Holocene Alluvium.

The geology of the Yucaipa Valley provides structural control of the groundwater flow in the area. Most of the structural groundwater control is provided by the San Andreas and Banning faults. These faults form the northern and southern boundaries of the groundwater basin, respectively, by way of their effectiveness as barriers to uniform groundwater flow.

The San Andreas Fault lies within a pronounced trough along the western margin of the San Bernardino Mountains. Movement along it is both right lateral and down to the south, with vertical displacements on the order of at least 300 feet being observed in drilled wells. This strike slip fault defines the northern boundary of the groundwater basin where it creates a fault contact between crystalline basement rock to the north and unconsolidated sediments to the

south. This contact consists of a zone of clay materials and sheared rock, which impedes the flow of groundwater across it.
The Banning fault enters the area approximately one mile south of Interstate 10 near Live Oak Canyon and transverses easterly through the community of Calimesa. It forms the southern boundary of the groundwater basin. Primary movement along the fault has been right lateral slip, although vertical displacements of up to 250 feet on the south side have been noted in drilled holes to the east.

Between the major bounding fault systems are several minor inter-basin faults and inferred barriers. Most of these features are aligned along the northeasterly line and formed in response to differential movements along the San Andreas and Banning faults. These include the Chicken Hill fault, Yucaipa barrier, Casa Blanca barrier and Gateway barrier. In addition to these are the Oak Glen fault and South Mesa barrier which are aligned in a northwesterly direction.

Due to the complex array of faults and barriers within the Yucaipa Valley, the area has been primarily characterized into seven subbasins, which are:

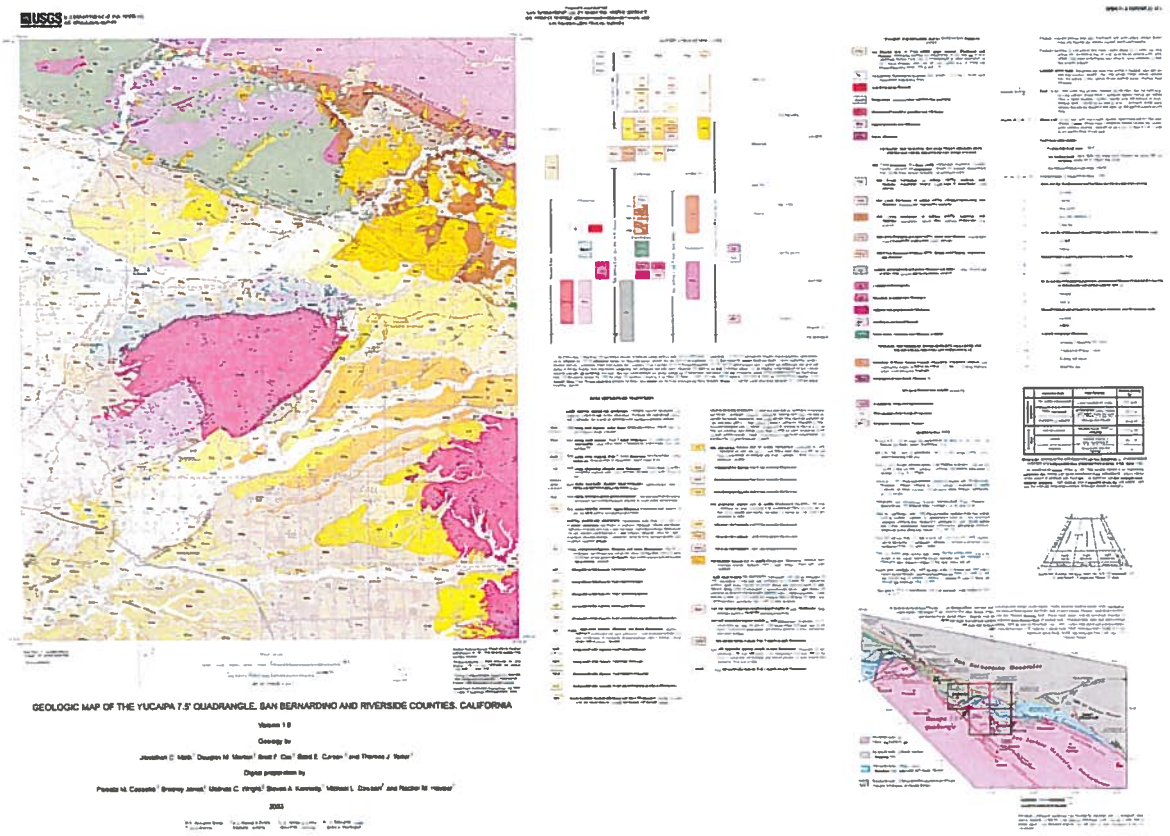
- Triple Falls Creek;
- Oak Glen;
- Gateway;
- Crafton;
- Wilson Creek;
- Western Heights; and
- Calimesa.

The geology of the Yucaipa Valley is extremely complex, yet well documented. The following geologic map of the Yucaipa 7.5' quadrangle (version 1.0) dated 2003 illustrates the complexity of the area situated within a right-step-over zone between the San Jacinto and San Andreas Fault zones. The USGS describes the quadrangle as being traversed by several faults of the San Andreas system, including (from oldest to youngest) the Banning Fault and the Wilson Creek, Mission Creek, Mill Creek, and San Bernardino Strands of the San Andreas Fault.[1]

The USGS identifies the complications within the San Andreas Fault system over the last several hundred thousand years have created a landscape setting in which Quaternary surficial materials of the Yucaipa quadrangle have accumulated. Crustal extension throughout the San Bernardino Basin region led to uplift of the Crafton Hills block and down-dropping of the Yucaipa Valley region on faults of the Crafton Hills and Chicken Hill complex. Subsequent middle and late Quaternary stream flows deposited several generations of axial-valley and alluvial-fan sediment in the down-dropped lowlands. These deposits and the older San Timoteo beds they overlie record the history of Quaternary fault movements, and form reservoirs for ground water in the Yucaipa quadrangle.

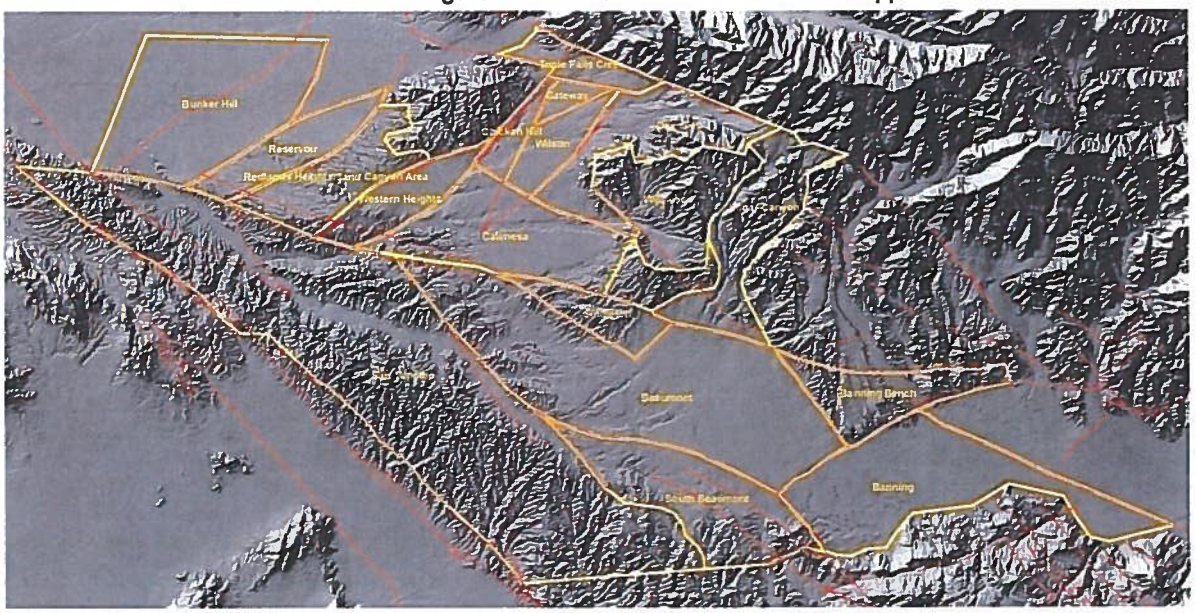
The historical geology of the area has required the District to adopt a multifaceted approach to solving our water supply issues in order to maximize the use of our limited groundwater basins. The following map can be downloaded for more information from http://geo-nsdi.er.usgs.gov/metadata/open-file/03-301/metadata.faq.html.[2]

[1] USGS Geoscience Data Catalog geologic map and digital database of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California.
[2] Matti, Jonathan C. , Morton, Douglas C. , Cox, Brett F. , Carson, Scott E. , and Yetter, Thomas J. , 2003, Geologic map and digital database of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California: United States Geological Survey Open-File Report 03-301, U.S. Geological Survey, Menlo Park, California.


USGS
GEOLOGIC MAP OF THE YUCAIPA 7.5' QUADRANGLE, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA
Version 1.0
Geology by
2003

The extensive faults and active geology of the Yucaipa Valley creates a unique configuration of groundwater basins with hydrogeologic conditions that are fairly distinct for each subbasin within the region. Studies conducted by the USGS (Moreland, 1970) and David Keith Todd (Todd, 1988) have estimated the safe yield of the collective subbasins at 7,100 and 7,900 acre-feet/year, respectively. Both studies represent the best available estimate of the safe yield for the collective Yucaipa basins.

Figure 2-6 – Fault Boundaries within the Upper Santa Ana Watershed



Source: The Perennial Yield of the Yucaipa Groundwater Basin, December 1988, David Keith Todd Consulting Engineers, Inc., Berkeley, California.

Historic extractions from this basin since 1949 have fluctuated between 10,000 and 12,000 acre-feet/year as reported in these studies. In general, water levels in the majority of the subbasins experienced a steady decline between the mid 1940's and 1970's. In the late 1970's, the water levels began to level off but continued to decline.

Historical records indicate that only very small amounts of local runoff have been retained in the Wilson spreading facilities since the basins have been historically used for flood control purposes. Information adapted from the 1988 Todd report indicates that during the 1934-64 period annual diversions for retention into these basins ranged from less than 10 to over 1,200 acre-feet/year, with an average of about 250 acre-feet/year.

The amount of water recharged in these basins is very small when compared to their spreading capacity and the amount of water available for recharge. The Wilson spreading basins have a recharge area of approximately 12 acres. Infiltration test conducted by Moreland (1970) indicate that the infiltration capacity of these basins is approximately 1.5 feet per day. Similar infiltration rates were calculated in the Reclaimed Water Master Plan (MacDonald Stephens, 1992) by reviewing daily inflow records of imported water from Mill Creek over a 35 day period to determine the long term infiltration rates. The results of that observation indicate an infiltration rate of 0.7 cfs per acre, which is equivalent to 1.4 feet per day.

2.3.3 Groundwater Management Zones

On January 22, 2004, the Santa Ana Regional Water Quality Control Board adopted Resolution R8-2004-0001, which amended the water quality control plan for the Santa Ana Watershed. This basin plan document established groundwater management zones to ensure historical water quality is maintained, pursuant to the State of California antidegradation policy (SWRCB Resolution No. 68-16).

For Yucaipa Valley Water District and two other entities, less stringent "maximum benefit" objectives were established based on demonstrations by the agencies that antidegradation requirements were satisfied. Specifically, the Yucaipa Valley Water District demonstrated that beneficial uses would continue to be protected and showed that water quality consistent with maximum benefit to the people of the State of California would be maintained. Other factors, such as economics, the need to use recycled water, and the need to develop housing in the area were also taken into account in establishing the objectives.

The demonstration of "maximum benefit" by the Yucaipa Valley Water District is contingent on the implementation of specific projects and programs. Provided that the commitments are met, then the Yucaipa Valley Water District has demonstrated maximum benefit, and the "maximum benefit" objectives included for these waters apply for the purposes of regulating projects. However, if the Regional Board finds that these commitments are not being met and that "maximum benefit" is thus not demonstrated, then the "antidegradation" objectives for these waters will apply.

Figure 2-7- San Timoteo Watershed Management Zone Boundaries

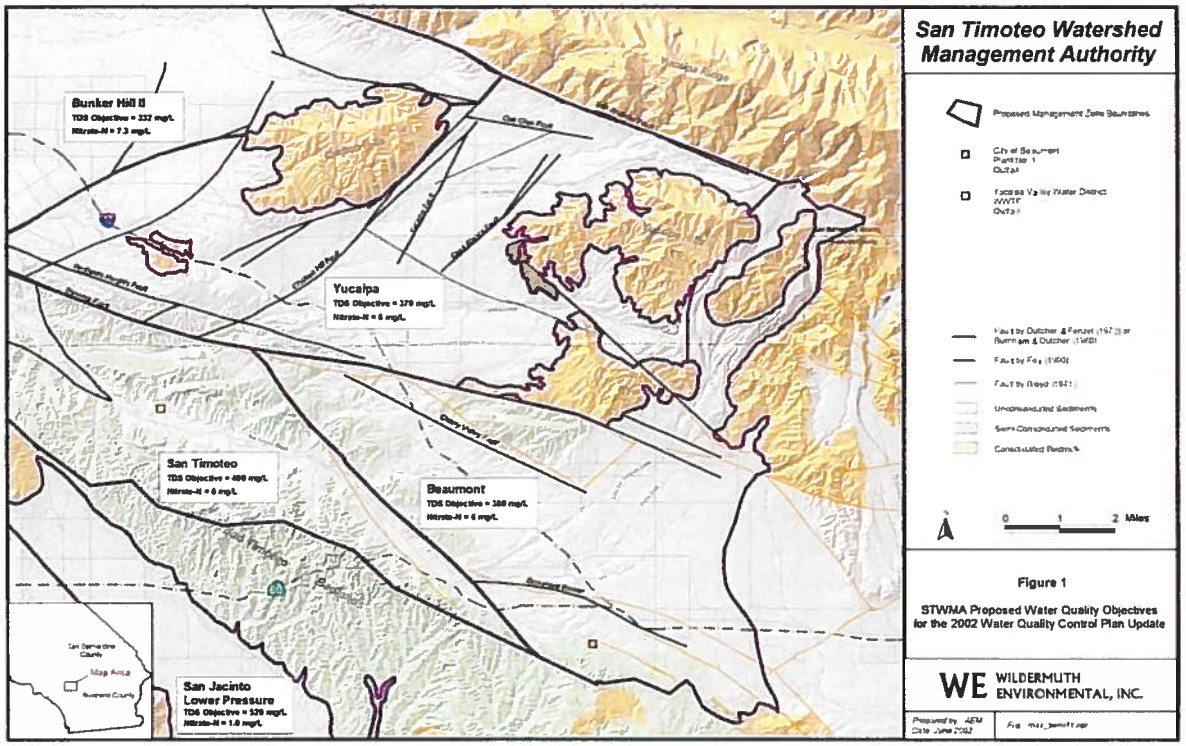
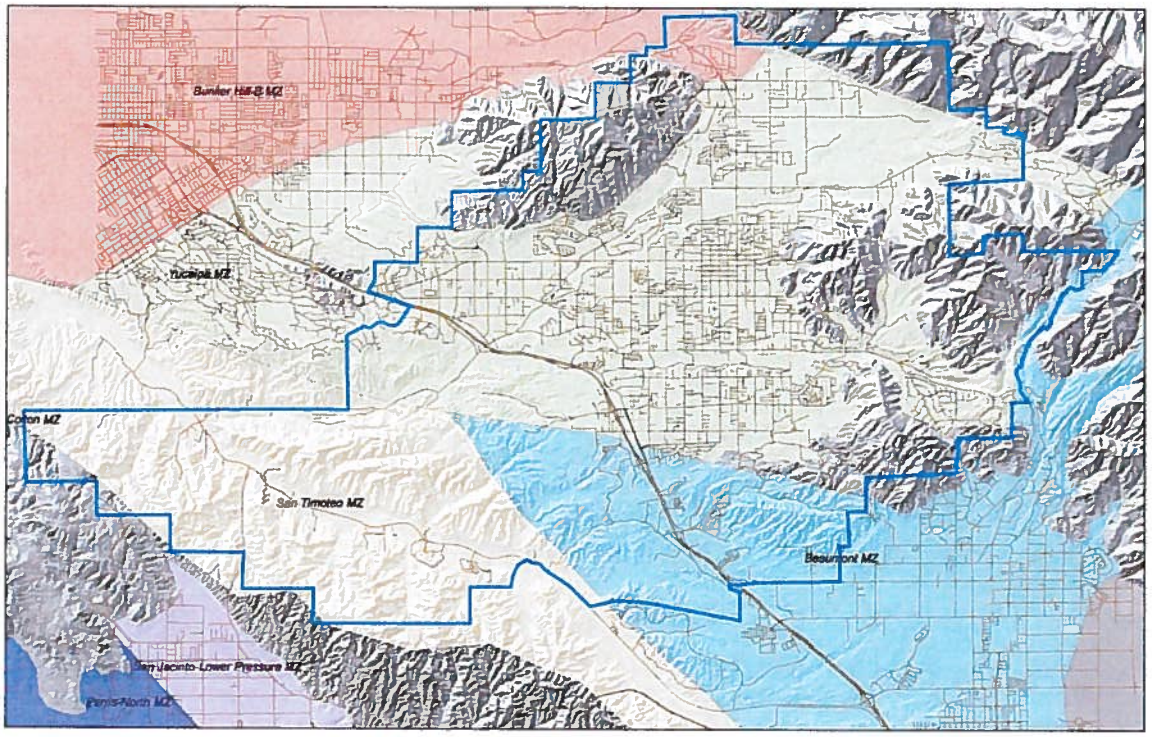


Figure 2-8 - RWQCB Groundwater Management Zones

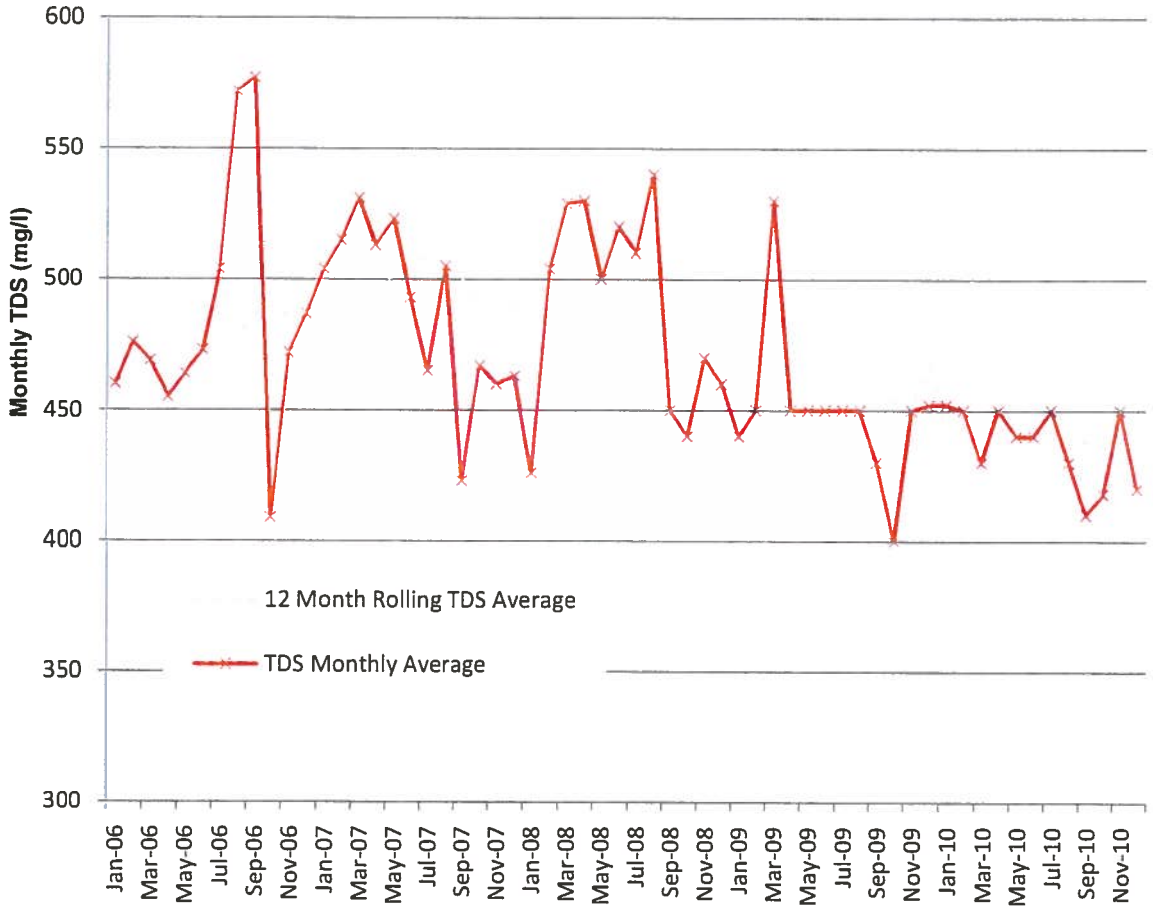


Federal law requires states to establish water quality standards for all water bodies within the state's jurisdiction. A water quality standard is comprised of three parts: 1) the beneficial uses that apply to the water body; 2) the water quality criteria needed to protect those uses; and 3) an antidegradation policy to protect water quality that is already better than the applicable criteria. The Porter-Cologne Water Quality Control Act (Division 7, "Water Quality", of the California Water Code) establishes similar requirements in state law.

In California, Regional Water Quality Control Boards enact water quality standards through a formal basin planning process that sets groundwater quality objectives. Each Regional Board publishes a Basin Plan that identifies individual water bodies within its jurisdiction, designates the beneficial uses that apply to each water body and specifies the water quality criteria (or objectives) for those water bodies. Although the federal Clean Water Act applies only to surface waters, the Porter-Cologne Act applies to both the ground and surface waters of California.

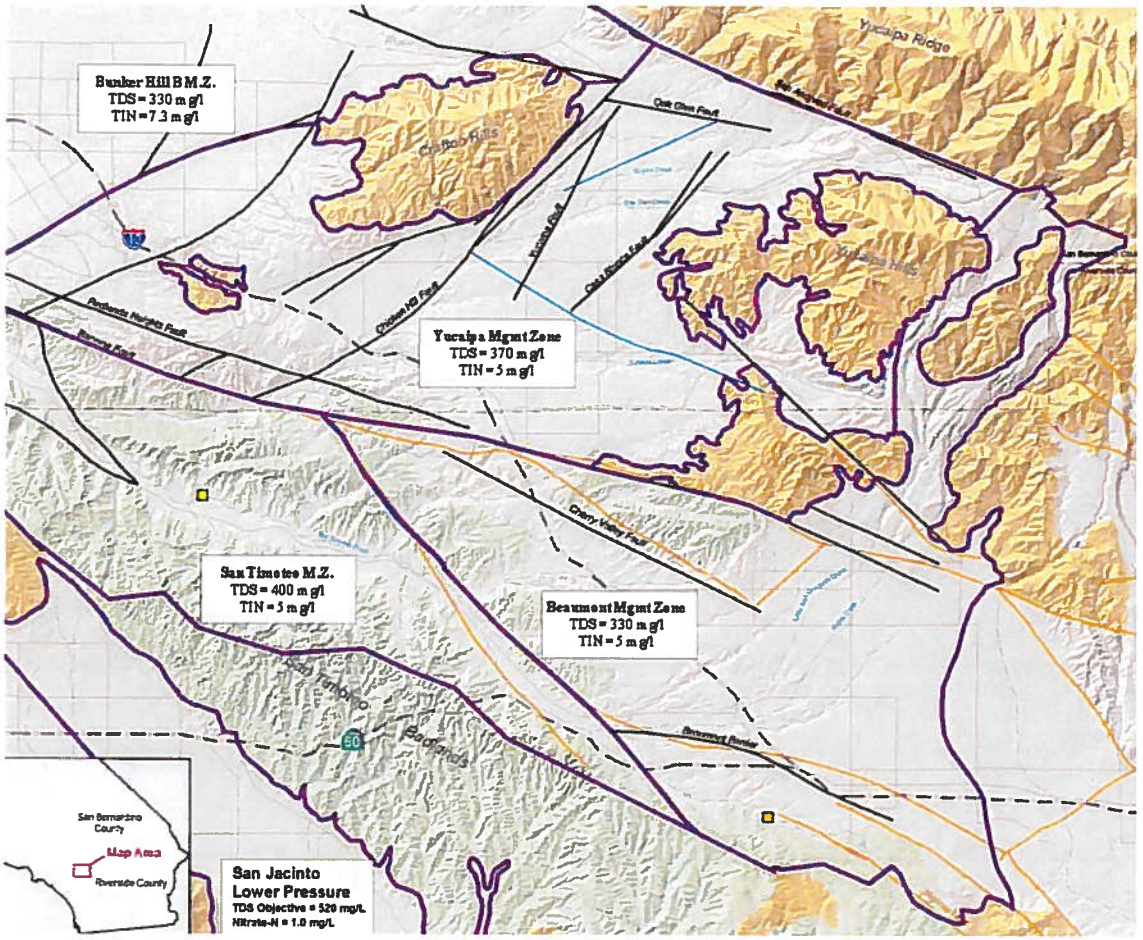
Of particular concern to the Yucaipa Valley Water District are the limitations set for total dissolved solids or typical salt (salinity) constituents in the recycled water supply. Below is a diagram of the recycled water total dissolved solids concentrations from the Wochholz Regional Water Recycling Facility.

Figure 2-9 Wochholz Regional Water Recycling Facility TDS Concentrations



The monthly value of total dissolved solids in the recycled water supply is 450 mg/l with a twelve-month average of 437 mg/l. To utilize the recycled water in the upper portion of the Santa Ana Watershed, the quality of the recycled water needs to meet an average quality of 330 mg/l for the Beaumont Management Zone; 370 mg/l for the Yucaipa Management Zone; or 400 mg/l for the San Timoteo Management Zone. In all cases, the amount of salt, or total dissolved solids of the recycled water, is more than the water quality objective set by the Regional Water Quality Control Board. These water quality objectives severely constrain the District from utilizing our recycled water without additional water treatment.

Figure 2-10 – San Timoteo Watershed TDS and TIN Water Quality Objectives



While these stringent objectives will result in additional costs for the District and our customers, these standards are actually relaxed based on a demonstration that less restrictive water quality objectives provide a benefit to the people of California. The most protective water quality objectives are established as the "antidegradation" values and will be triggered if certain commitments are not fully achieved.

Table 2-2- Total Dissolved Solids (Salinity Objectives) Impacting Yucaipa Valley Water District

Groundwater Management Zone	Maximum Benefit Objective	Antidegradation Objective
San Timoteo	400 mg/l	300 mg/l
Yucaipa	370 mg/l	320 mg/l
Beaumont	330 mg/l	230 mg/l

The commitments made by the District in order to maintain the Maximum Benefit Objectives include the following provisions as contained within our waste discharge permit adopted on February 2, 2007 by the Regional Water Quality Control Board (WDR Permit CA 0105619).

Table 2-3 – Yucaipa Valley Water District Maximum Benefit Objectives

Description of Commitment	Compliance Date – as soon as possible, but no later than
1. Surface Water Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Quarterly data report submittal d. Annual data report submittal	a. January 23, 2005 b. Within 30 days from Regional Board approval of monitoring plan c. April 15, July 15, October 15, January 15 d. February 15th
2. Groundwater Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Annual data report submittal	a. January 23, 2005 b. Within 30 days from Regional Board approval of monitoring plan c. February 15th
3. Desalter(s) and Brine Disposal Facilities a. Submit plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to be operational as soon as possible but no later than 7 years from date of Regional Board approval of plan/schedule. b. Implement the plan and schedule	a. Within 6 months of either of the following: i. When YVWD's effluent 5-year running average TDS exceeds 530 mg/L; and/or ii. When volume weighted average concentration in the Yucaipa Management Zone of TDS exceeds 360 mg/L b. Within 30 days from Regional Board approval of plan
4. Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes. The non Potable supply shall comply with a 10-year running average TDS concentration of 370 mg/L or less.	December 23, 2014
5. Recycled water recharge The recharge of recycled water in the Yucaipa or San Timoteo Management Zones shall be limited to the amount that can be blended with other recharge sources to achieve a 5-year running average equal to or less than the "maximum-benefit" objectives for TDS and nitrate-nitrogen for the relevant Management Zones. a. Submit baseline report of amount locations, and TDS and nitrogen quality of storm water/imported water recharge. b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of YVWD enhanced recharge facilities.	Compliance must be achieved by end of 5th year after initiation of recycled water use/recharge operations. a. Prior to initiation of construction of basins/other facilities to support enhanced storm water/imported water recharge. b. Annually, by January 15th, after initiation construction of facilities/implementation of programs to support enhanced recharge.
6. Ambient groundwater quality	July 1, 2005 and every 3 years thereafter

determination	
7. Replace denitrification facilities (necessary to comply with TIN wasteload allocation specified in Table 5-5)	New facilities shall be operational no later than December 23, 2007
8. YVWD recycled water quality improvement plan and schedule a. Submit plan and schedule b. Implement Plan and schedule	a. 60 days after the TDS 12-month running average effluent quality equals or exceeds530 mg/L for 3 consecutive months and/or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once replacement denitrification facilities are in place. b. Upon approval by Regional Board
9. Remove/reduce the discharge of YVWD effluent from the unlined portion of San Timoteo Creek a. Submit proposed plan/schedule b. Implement plan/schedule	a. June 23, 2005 b. Upon Regional Board approval
10. Construct the Western Regional Interceptor for Dunlap Acres a. Submit proposed construction plan and schedule. The schedule shall assure the completion of construction as soon as possible but no later than January 1, 2010. b. Implement plan and schedule	a. June 23, 2005 b. Upon Regional Board approval

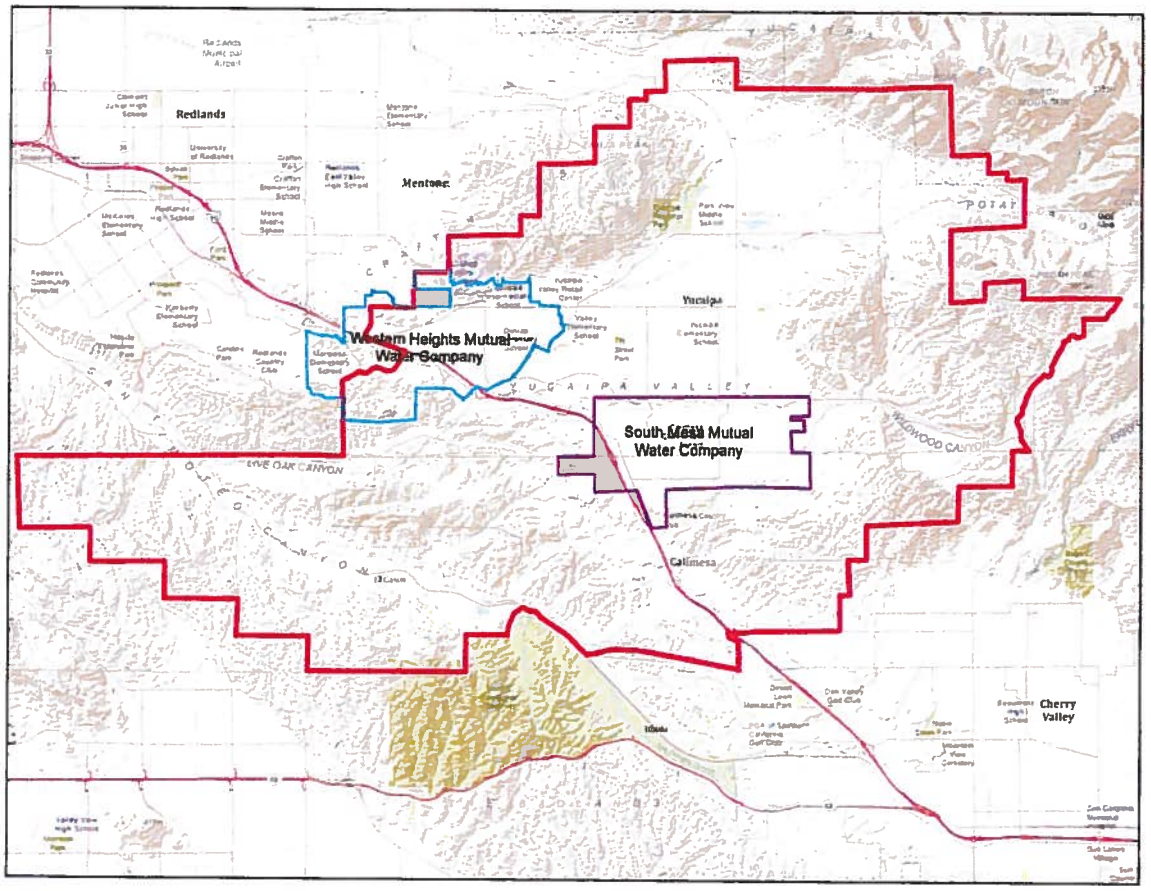
The District continues to meet the commitments, however in November 2010, the District learned of the lack of assimilative capacity in the San Timoteo Management Zone which now requires the immediate implementation of reduced total dissolved solids to a five-year average of 400 mg/l in order not to trigger the even more restrictive and costly antidegradation objectives.

2.3.4 Mutual Water Company Service Areas

The service area of the Yucaipa Valley Water District includes two mutual water companies the Western Heights Water Company and the South Mesa Water Company. The service area of the Western Heights Mutual Water Company is 4.53 square miles (2,902 acres) and the service area of the South Mesa Mutual Water Company is 4.00 square miles (2,561 acres).

The history of water companies in the Yucaipa Valley begins with the incorporation of the South Mountain Water Company on May 26, 1899. This company was formed to transport water from Oak Glen to the City of Redlands. On November 17, 1899 the Yucaipa Land and Water Company was incorporated to provide water directly to the Yucaipa Valley. Additional water companies formed in the Yucaipa Valley with the formation of the Redlands and Yucaipa Land Company in 1909 and the Redlands and Yucaipa Water Company in 1910.

Figure 2-11 - Mutual Water Companies within the Sphere of Influence of the Yucaipa Valley Water District



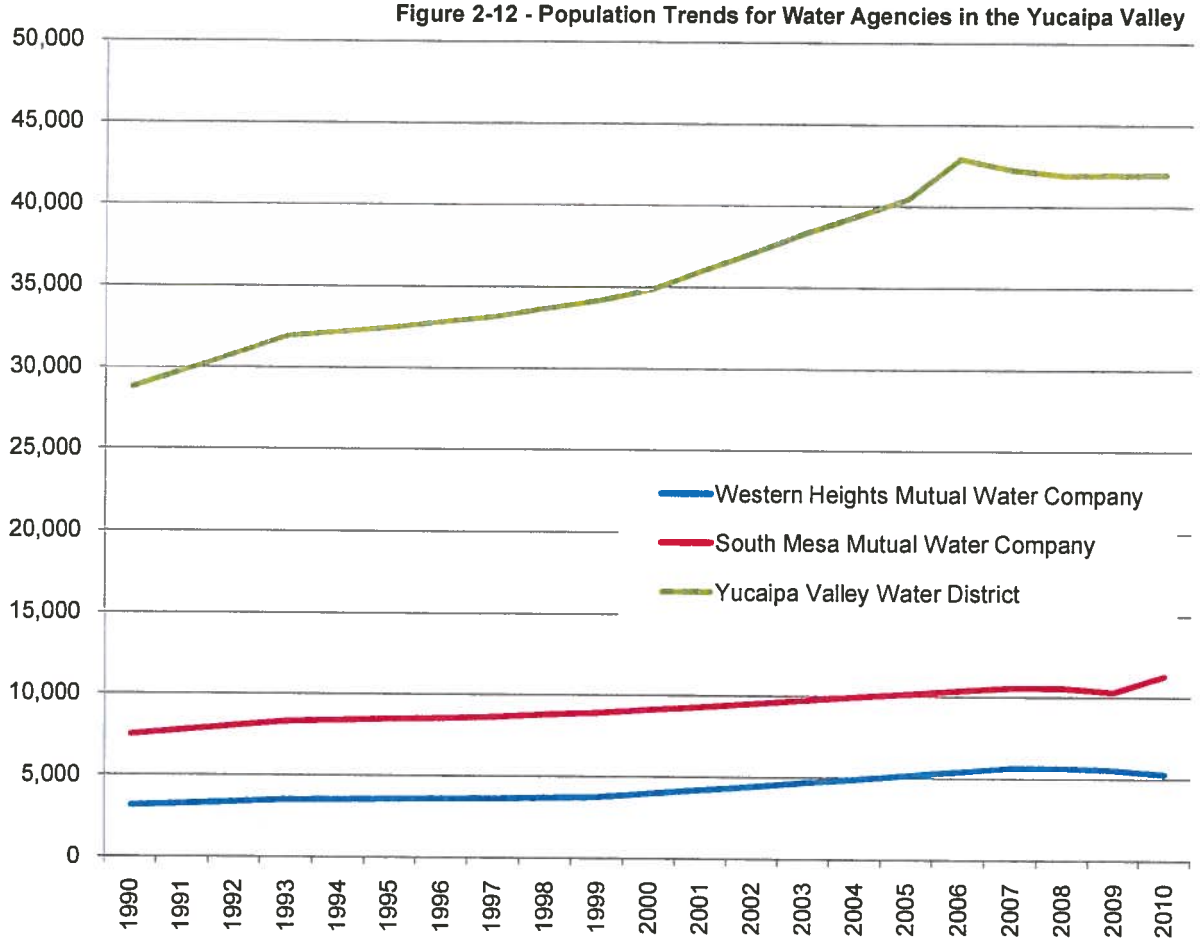
The Redlands and Yucaipa Land Company continued to expand and formed separate companies to provide water service in various areas within the Yucaipa Valley. Most of the companies are now consolidated within the Yucaipa Valley Water District's service area boundary.

Table 2-4 – Summary of Mutual Water Company Formations in the Yucaipa Valley

Company	Date Incorporated	Notes
Yucaipa No. 1	February 4, 1910	Currently part of Yucaipa Valley Water District
Yucaipa No. 2	February 17, 1912	Name changed to Western Heights Mutual Water Company on June 12, 1913.
Yucaipa No. 3	November 2, 1912	Name changed to South Mesa Water Company on June 12, 1913.
Yucaipa Domestic	January 30, 1912	Currently part of Yucaipa Valley Water District
Triple Falls	November 7, 1912	Currently part of Yucaipa Valley Water District
Section 30	October 12, 1921	Currently part of Yucaipa Valley Water District

In the future, the population of Western Heights Mutual Water Company and South Mesa Water Company are expected to have limited growth as compared to the larger service area boundary of the Yucaipa Valley Water District. The chart below illustrates the twenty year population trends for each water service area in the Yucaipa Valley.

Figure 2-12 - Population Trends for Water Agencies in the Yucaipa Valley



2.4 The Climate of the Yucaipa Valley

Describe the service area climate (California Water Code Section 10631(a))

Temperatures in the District range from an average high of 78° and an average low of 49°. The record high for the area is 117° and the record low is 17°.

The annual average rainfall for the area is about 15.80 inches per year. The climate is characterized by hot dry summers when temperatures can rise above 100°, and moderate winters, with rare freezing temperatures. A major portion of the precipitation occurs between December and March. Snow in the upper reaches of the area is possible, but is not considered an important contributing factor to runoff.

Figure 2-13 – Yucaipa Valley Water District Average Daily Accumulated Precipitation

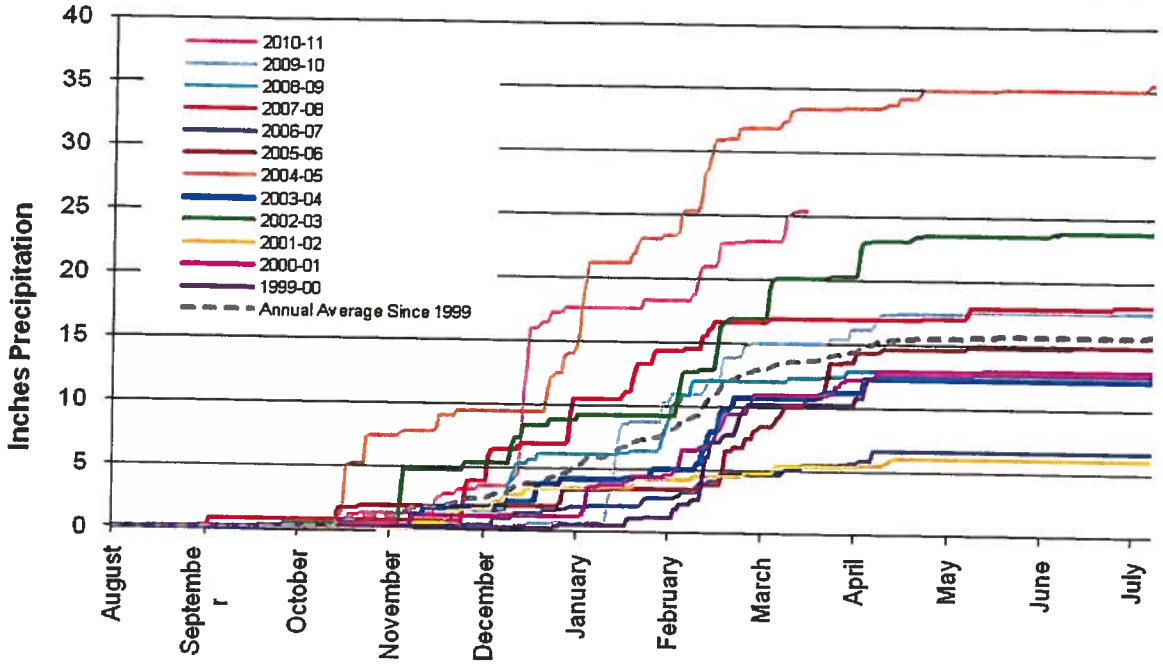


Figure 2-14 – Yucaipa Valley Water District Maximum and Average Daily Rainfall Since 1999

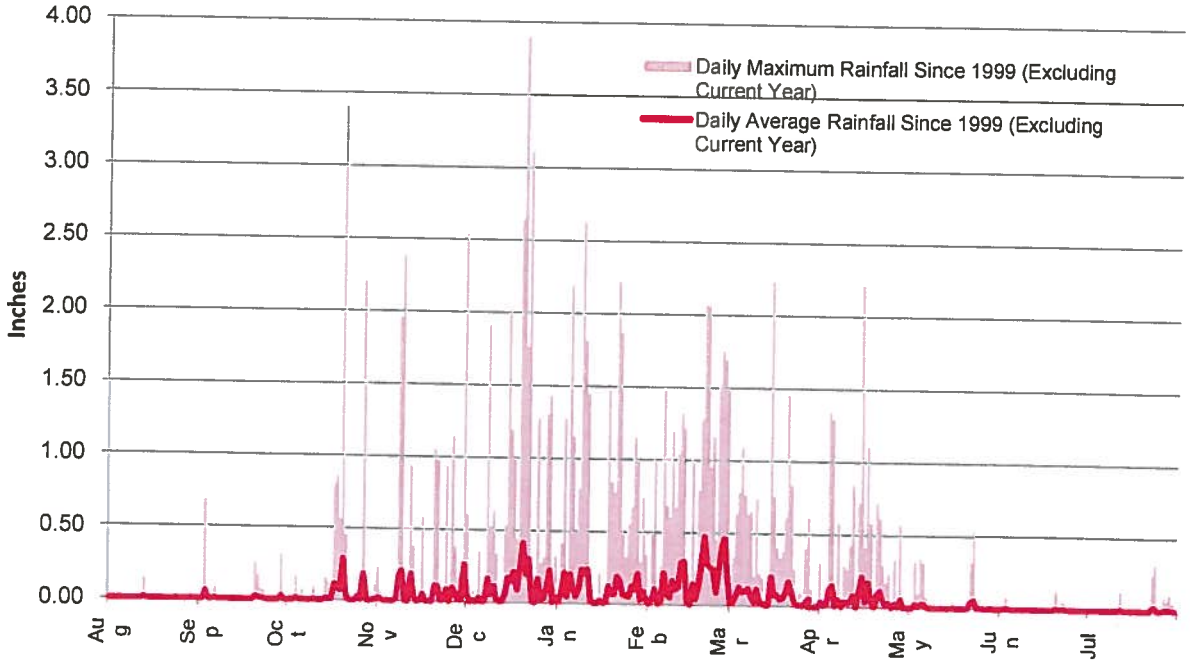


Table 2-5- Climate Data for Yucaipa Valley Water District Service Area

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Standard Monthly Avg. ET0 (inches)	3.32	2.41	4.62	5.58	6.32	5.37	7.60	6.68	5.89	4.40	3.18	2.08	57.45
Avg. Total Precipitation (inches)	2.67	2.65	2.31	1.18	0.48	0.11	0.06	0.15	0.29	0.70	1.14	1.79	13.53
Avg. Max. Temperature (degrees F)	64.7	66.1	69.1	73.7	78.5	86.7	94.5	94.2	90	81	72.6	65.9	78.1
Avg. Min. Temperature (degrees F)	39.3	41.3	43.6	46.8	51.1	55.2	60.3	60.6	57.5	51.2	44	39.6	49.2

Average evapotranspiration from a standardized grass surface (reference evapotranspiration or ET0) was found on the California Irrigation Management System (CIMIS) website. The nearest CIMIS station is at the University of California, Riverside, Station #44, which has been operating since June 1985.[b] Average temperature and precipitation information for Redlands, CA is from the National Oceanic and Atmospheric Administration (NOAA) website http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?caredl. The period of record is from 12/1/1927 to 3/31/2005.

2.5 Population and Demographics

(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . (California Water Code Section 10631(a)).
(Population projections) shall be in five-year increments to 20 years or as far as data are available (California Water Code Section 10631(a)).

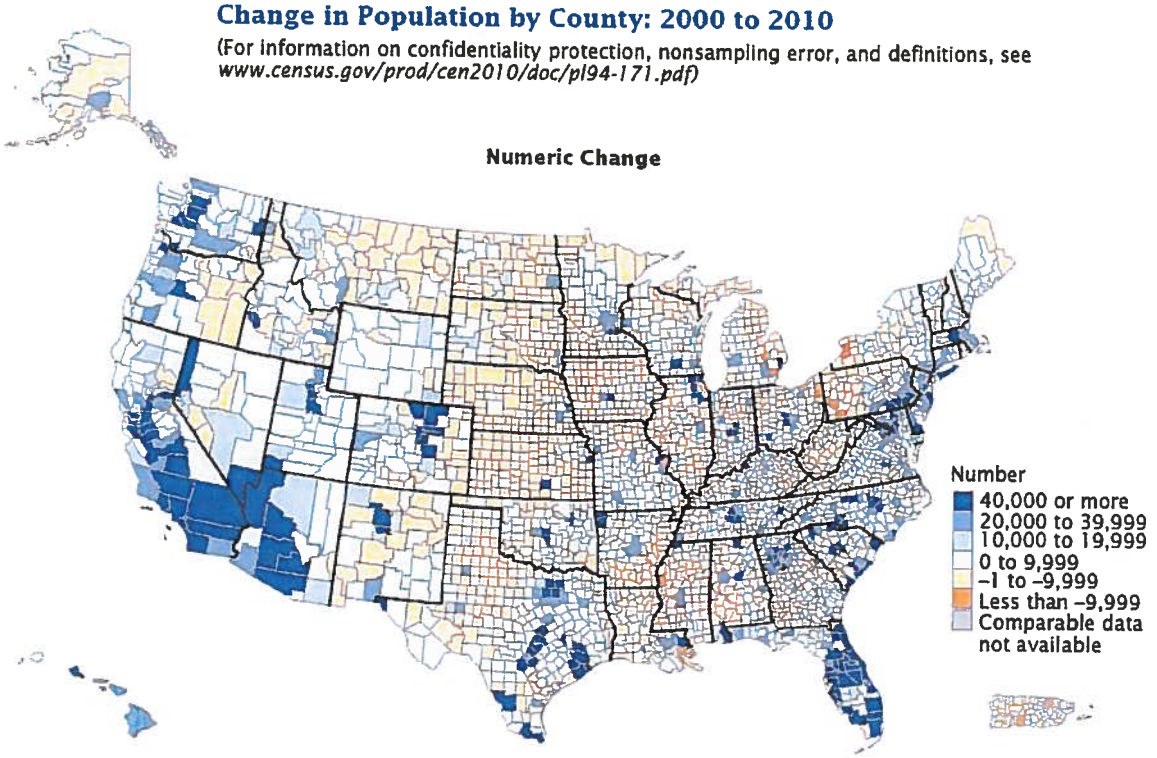
Table 2-6 - Population Data and Estimates

	1990	2000	2010	2015	2020	2025	2030	2035	2040
Western Heights Mutual Water Company	3,152	4,060	5,313	5,611	5,954	6,444	6,916	7,179	7,407
South Mesa Mutual Water Company	7,486	9,000	11,282	11,914	12,644	13,684	14,687	15,244	15,728
Yucaipa Valley Water District	28,764	34,862	42,171	45,627	49,602	54,985	60,435	64,228	67,844
Yucaipa Valley Water District - San Bernardino County Service Area			51,458	53,550	55,698	57,819	59,960	61,934	63,846
Yucaipa Valley Water District - Riverside County Service Area			7,308	8,659	10,279	12,297	14,739	17,803	21,153

The Yucaipa Valley Water District is located in one of the fastest growing areas of the United States. Based on California's 15 most-populous counties, San Bernardino's growth rate of 20.5 percent to 1.7 million people was topped only by Riverside County, which grew the fastest.

Change in Population by County: 2000 to 2010

(For information on confidentiality protection, nonsampling error, and definitions, see *www.census.gov/prod/cen2010/doc/pl94-171.pdf*)



Section 3

Water System Demands

3.1 Baselines and Targets

An urban retail water supplier shall include in its urban water management plan due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data (10608.20(e)).

There are several steps required for developing the SBX7-7 water conservation goals. The following methodology was used to determine the interim urban water use target and the 2020 compliance daily per capita water use.

Figure 3-1 - SBX7-7 Methodology Illustration

3.1.1 Determination of the Base Daily per Capita Water Use

The Water Conservation Bill of 2009 requires each urban water retail water supplier to include in its Urban Water Management Plan an estimate of base daily per capita water use. Base daily per capita water use, measured in gallons per capita per day (GPCD) is established for an initial period of time, which is referred to as the 10- to 15-year base period.

Three technical methodologies have been developed to support a water supplier in determining its base daily per capita water use:

- Technical Methodology 1: Gross Water Use
- Technical Methodology 2: Service Area Population
- Technical Methodology 3: Base Daily Per Capita Water Use

The following figure has been prepared by the Department of Water Resources as a guide for developing water conservation goals.

The Yucaipa Valley Water District has elected to utilize Technical Methodology 2: Service Area Population to assist in the calculations to determine the base daily per capita water use.

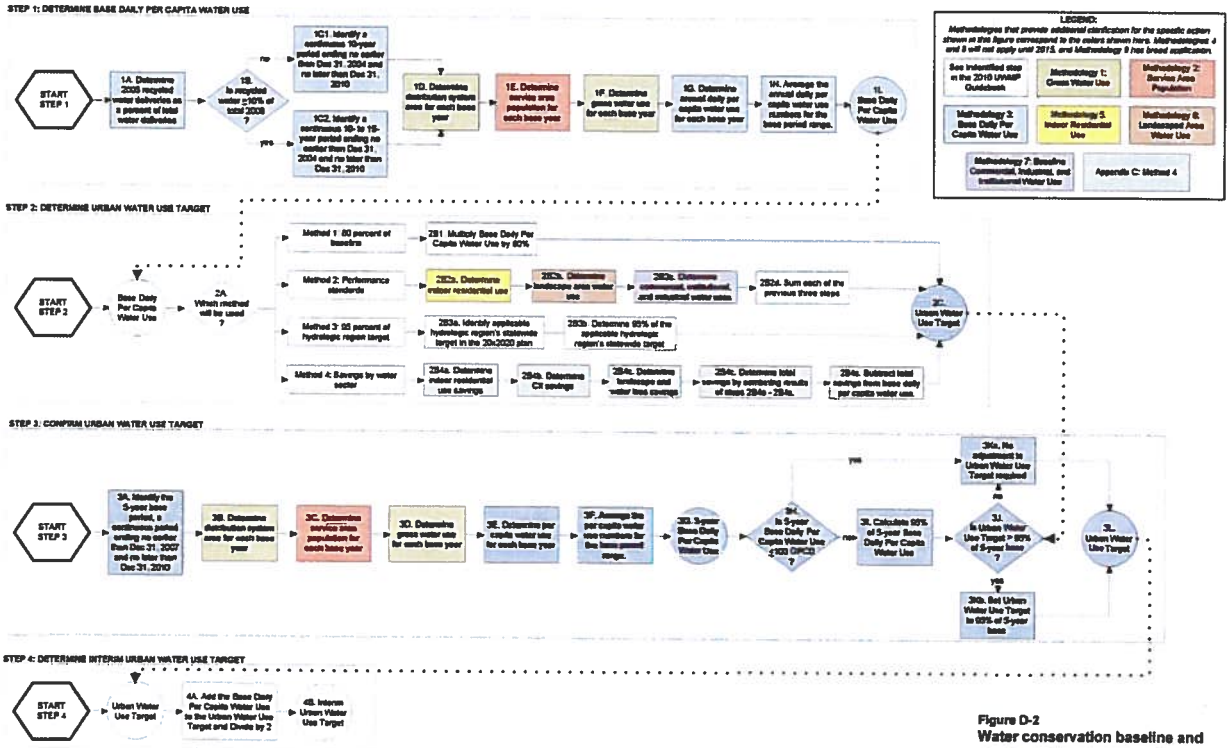


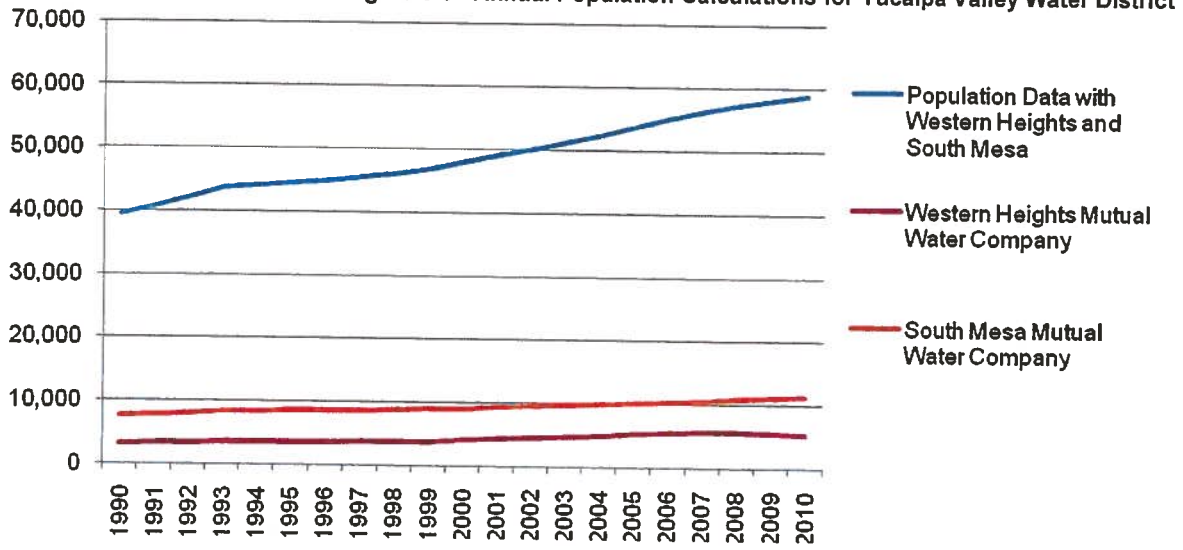
Figure D-2
Water conservation baseline and targets development process

Figure 3-2: Water Conservation Baseline and Targets Development Process

The population calculations for the Yucaipa Valley Water District were determined using data published from the California Department of Finance and the U.S. Census Bureau. Years with population estimates that did not provide a reasonable trend were adjusted to reflect an overall increasing population trend for the Yucaipa Valley Water District's service area. The District's service area boundary falls within Category 2 of the Department of Water Resources three scenarios of potential boundary characteristics. Category 2 is described as water suppliers whose actual distribution area *does not* overlap substantially (≥95%) with city boundaries but has Geographic Information System maps of their distribution area. The service area population was further refined using a geographical information system coupled with additional local population resources provided by the Southern California Association of Governments (SCAG). SCAG is the largest Metropolitan Planning Organization (MPO) in the United States. As the designated MPO, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.

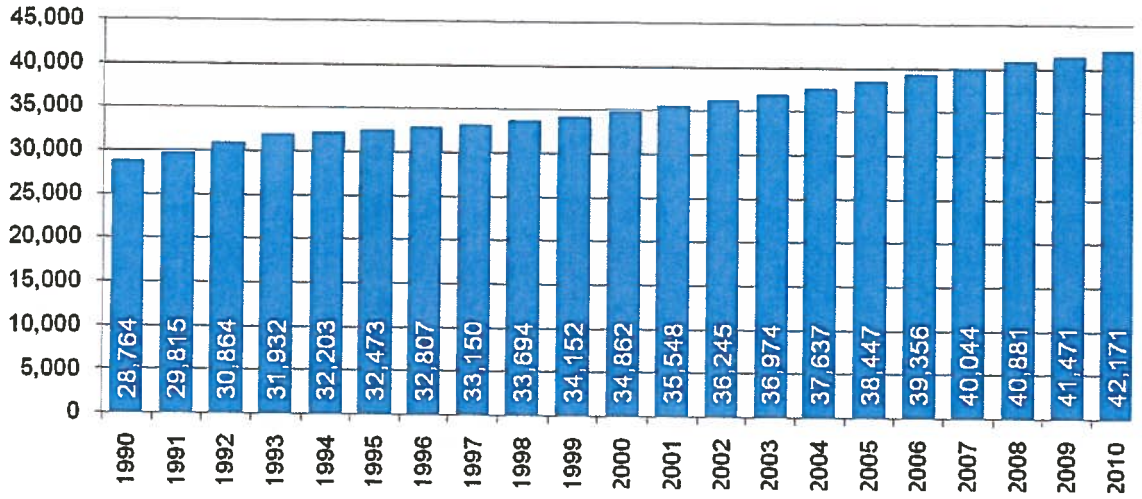
The first step for calculating the service area population of the Yucaipa Valley Water District was to determine the population of the entire service area. The population data was then further refined to determine the population of the service areas for Western Heights Mutual Water Company and South Mesa Mutual Water Company.

Figure 3-3 - Annual Population Calculations for Yucaipa Valley Water District



The difference between the total population of the Yucaipa Valley Water District service area and the population figures for Western Heights Mutual Water Company (red line) and South Mesa Mutual Water Company (orange line) provides the population of the area served by the Yucaipa Valley Water District.

Figure 3-4 - Population Served by Yucaipa Valley Water District from 1990 to 2010



In addition the City of Calimesa and the City of Yucaipa provided population projections for the years 2020, 2030, 2040, and 2050. It is assumed that these projections include the portions of the unincorporated County areas that lie in the District's sphere of influence.

3.1.2 Determination of Urban Water Use Target

The water supplier has four different methods to be considered for determining the urban water use target. Methods 1 through 3 were established by the Legislature in the Water Conservation Bill of 2009. Urban Water Use Target Method 4 was subsequently prepared by the California Department of Water Resources and an advisory committee according to the requirements provided in California Water Code Section 10608.20(b)(4). The four methods for determining urban water use targets are:

- Method 1: 80% of base daily per Capita Water Use
- Method 2: Performance Standards
- Method 3: 95% of Regional Target
- Method 4: Water Savings

During the preparation of this document, all of the four methods were examined in order to determine the most appropriate gallons per capita per day water reduction for Yucaipa Valley Water District. Method 1 became the most feasible method to achieve the 20% water reduction by 2020. The current baseline is 291.38 gpcd resulting in a water use target of 233.10 gpcd.

3.1.3 Regional Alliance

The baseline targets for Yucaipa Valley Water District were developed individually however these targets will be incorporated into the Regional Urban Water Management Plan coordinated by San Bernardino Valley Municipal Water District. Participants in this plan include the City of Colton, the City of Loma Linda, the City of Redlands, San Bernardino Municipal Water Department, East Valley Water District, and West Valley Water District. The San Bernardino Regional Alliance met quarterly beginning in March 2010. The quarterly meetings were used to identify and define the new Urban Water Management Plan requirements along with

determination of Demand Management Measures that are consistent among several agencies in order to reduce duplication of efforts.

Table 3-1 – Base Period Ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	4,583	*see below*
	2008 total volume of delivered recycled water	390.141	*see below*
	2008 recycled water as a percent of total deliveries	8.5	percent
	Number of years in base period	10	years
	Year beginning base period range	2000	
	Year ending base period range	2009	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2005	
	Year ending base period range	2009	

Units in the table above are in million gallons.

The following table provides data for the base daily per capita water use over a ten year period, from 2000 to 2010.

During this period the base daily per capita water use was 291.38.

Table 3-2 - Base Daily Per Capita Water Use - Ten Year Range

Base period year		Distribution System Population	Daily System Gross Water Use (million gallons)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2000	34,862	9,204,411	264.02
Year 2	2001	35,548	9,298,082	261.56
Year 3	2002	36,245	10,486,548	289.32
Year 4	2003	36,974	9,803,014	265.13
Year 5	2004	37,637	11,465,808	304.64
Year 6	2005	38,447	11,204,822	291.44
Year 7	2006	39,356	12,135,534	308.35
Year 8	2007	40,044	13,198,822	329.61
Year 9	2008	40,881	12,557,945	307.18
Year 10	2009	41,471	12,131,013	292.52
		Base Daily Per Capita Water Use		291.38

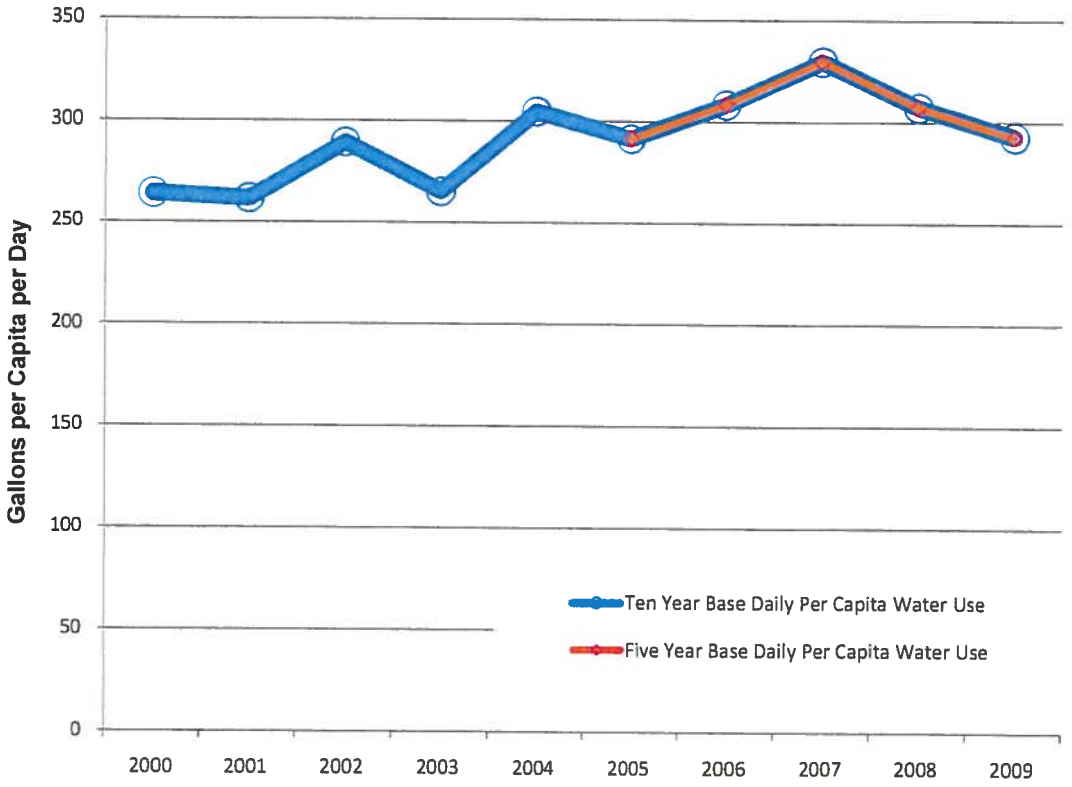
The following table illustrates the per capita water use for a five year period from 2005 to 2009. During this period the base daily per capita water use was 305.82.

Table 3-3 - Base Daily Per Capita Water Use - Five Year Range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2005	38,447	11,204,822	291.44
Year 2	2006	39,356	12,135,534	308.35
Year 3	2007	40,044	13,198,822	329.61
Year 4	2008	40,881	12,557,945	307.18
Year 5	2009	41,471	12,131,014	292.52
		Base Daily Per Capita Water Use		305.82

The following figure provides a graphical representation of Table 3-2 and Table 3-3.

Figure 3-5 - Daily Per Capita Water Use, 5 and 10 year Periods



3.2 Water Demands

Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (California Water Code Section 10631(k)).

Table 3-4 - Actual Water Deliveries for 2000, 2005 & 2010

Water Use Sectors	2000 Customer Accounts Metered		2005 Customer Accounts Metered		2010 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	8,144	2,354.4	10,900	2,651.9	11,044	2,451.9
Multi-family	438	511.4	523	326.0	518	399.3
Commercial/Institutional	212	146.9	262	156.6	279	153.4
Industrial	17	57.8	21	12.2	15	26.5
Landscape	46	241.4	129	521.6	165	551.3
Agriculture*	2	6.8	2	4.0	2	7.2
Other*	62	39.0	144	73.0	103	115.9
Total	11,979	3,357.7	11,979	3,745.3	12,126	3,705.5

Notes:

- *The volumetric units on this table are million gallons.*
- *Data for this table is from the DWR Public Water System Statistics Reports.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility or the Yucaipa Valley Regional Water Filtration Facility.*

The following chart illustrates the distribution of water customer classifications for the Yucaipa Valley Water District. In 2010, the Yucaipa Valley Water District had the following distribution of water customers:

- 91.2% - Single family water customers;
- 4.3% - Multi-family water customers;
- 2.3% Commercial/Institutional water customers;
- 0.1% Industrial water customers;
- 1.4% Landscape irrigation customers; and
- 0.8% Other classified water customers.

Figure 3-6 - Customer Classifications for 2000, 2005 and 2010

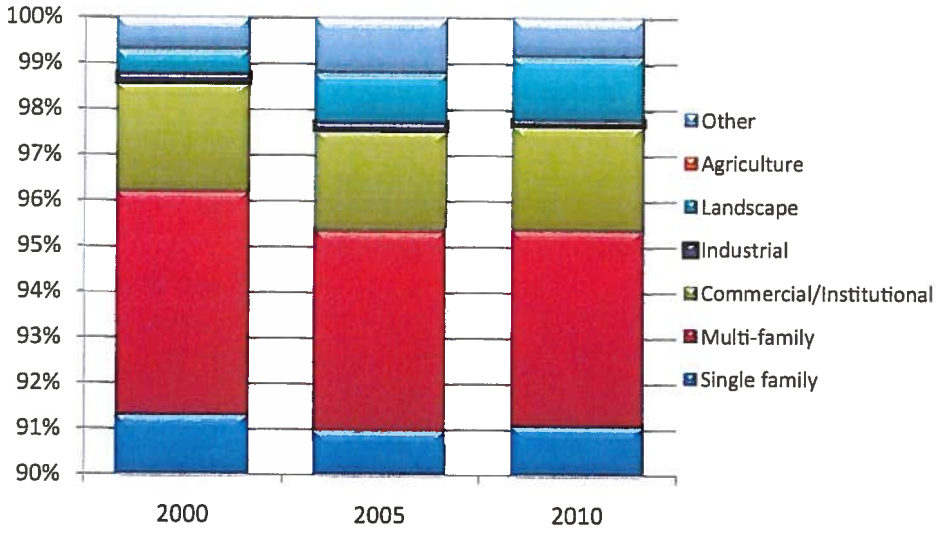


Table 3-5 Projected Calendar Year Water Deliveries for 2015, 2020 and 2025

Water Use Sectors	2015 Customer Accounts Metered		2020 Customer Accounts Metered		2025 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	12,798	3,060.331	14,817	3,193.580	17,583	3,339.879
Multi-family	613	471.626	709	492.161	842	514.707
Commercial/Institutional	322	189.108	373	197.342	443	206.382
Industrial	19	32.206	22	32.565	26	34.056
Landscape	147	583.730	170	609.145	201	637.051
Agriculture*	2	5.217	2	5.365	2	5.294
Other*	132	87.394	153	91.199	182	95.377
Total	14,033	4,428.613	16.247	4,621.357	19,279	4,832.747

Notes:

- *The volumetric units on this table are million gallons.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility.*

Table 3-6 Projected Calendar Year Water Deliveries for 2030, 2035 and 2040

Water Use Sectors	2030 Customer Accounts Metered		2035 Customer Accounts Metered		2040 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	20,353	3,501.934	22,198	3,680.064	23,929	3,866.076
Multi-family	974	539.681	1,063	567.133	1,145	595.799
Commercial/Institutional	512	216.396	559	227.404	602	238.898
Industrial	31	35.709	33	37.525	36	39.422
Landscape	233	667.961	254	701.938	274	737.418
Agriculture*	2	5.337	2	5.318	2	5.327
Other*	210	100.005	229	105.092	247	110.404
Total	22,316	5,067.024	24,338	5,324.474	26,234	5,736.529

Notes:

- *The volumetric units on this table are million gallons.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility.*

Figure 3-7 - Projected Water Customer Classifications

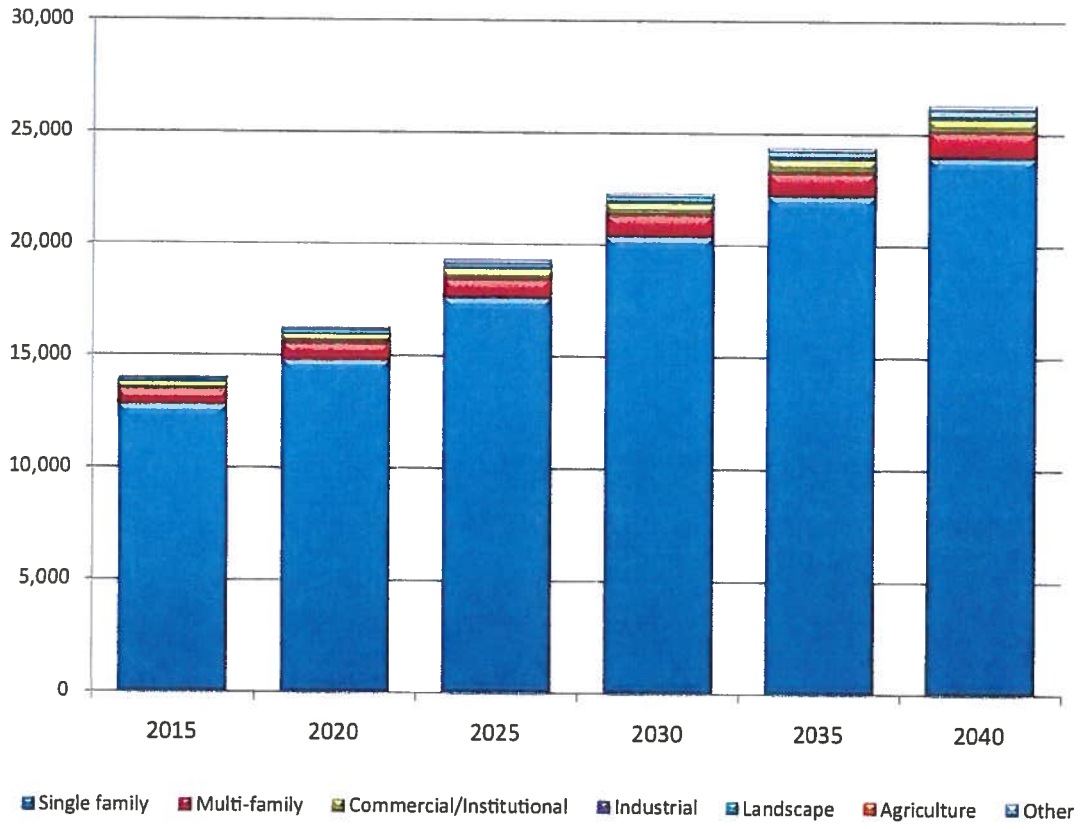


Table 3-7 – Sales To Other Water Agencies

Water Sales Information	2005	2010	2015	2020	2025	2030	2035
Western Heights Mutual Water Co.	0.000	51.390	144.946	143.548	143.175	143.184	143.185

Others	0	0	0	0	0	0	0
Total	0.000	51.390	144.946	143.548	143.175	143.184	143.185

Units in million gallons per year.

Table 3-8 – Additional Water Uses and Losses

Description	2005	2010	2015	2020	2025	2030	2035
Water Use [1]	3,745.300	3,706.500	4,428.613	4,621.357	4,832.747	5,067.024	5,324.474
Saline Barriers	0	0	0	0	0	0	0
Groundwater Recharge	0	1,500.578	1,630.000	1,711.500	1,793.000	1,793.000	1,793.000
Conjunctive Use[2]	0	299.920	326.000	356.318	387.288	422.170	459.986
Recycled Water	0	340.996	517.036	709.050	921.276	1,155.344	1,412.232
System Losses	0	196.904	114.100	118.338	116.056	112.796	107.580
Others	0	0	0	0	0	0	0
Total	3,745.300	6,044.898	7,015.749	7,516.563	8,050.367	8,550.334	9,097.272

Units in million gallons per year. [2] YVWD's service area covers San Bernardino County and Riverside County requiring purchase of SWP water from two wholesalers.

Table 3.9– Total Water Use

Description	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries	3,745.300	3,706.500	4,428.613	4,621.357	4,832.747	5,067.024	5,324.474
Sales to Other Water Agencies	0.000	51.390	144.946	143.548	143.175	143.184	143.185
Additional Water Uses and Losses	0.00	2,338.400	2,587.140	2,895.210	3,217.620	3,483.310	3,772.800
Total	3745.300	6096.290	7160.699	7660.115	8193.542	8693.518	9240.459

Units in million gallons per year.

3.2.1 Technical and Economic Feasibility of Projected Water Uses

Over the past two decades, the Yucaipa Valley Water District has been actively taking steps to improve the social, economic and environmental sustainability of our community. These actions have included the purchase of valuable watershed properties, protection of local water supplies and management of environmental corridors. While the decisions to embark on these actions have been generally unrelated, a look back in time indicates that the District has been progressing towards a more independent, flexible and sustainable future.

The proactive steps taken by the District to protect and conserve our resources have been based on the concepts that: (1) resources are not limitless and therefore need to be conserved, nurtured and renewed; and (2) resources that are used to generate short-term gains result in an inefficient and inequitable consumption of resources that are not beneficial for a long-term strategy. Both of

these concepts help to guide the District to make decisions that are conservative, careful and conscious of the role we currently play in a long-term strategy to protect the community.

On August 20, 2008, the Board of Directors adopted A Strategic Plan for a Sustainable Future - The Integration and Preservation of Resources. The development of this document was based upon suggestions from the board members, staff, the public and interested stakeholders. We appreciated the constructive feedback we received to begin our journey of a sustainable future for our community.

The purpose of pursuing a strategic plan for a sustainable future is twofold.

- First and foremost, the sustainability plan has been designed to establish the policies and guidelines necessary to protect and preserve the natural resources entrusted to the District for our customers. It is our business to maximize the use of our limited natural resources for the long-term economic growth and expansion of the local economy. In the arid southwest, the basic fuel to create and maintain a local economy is water.
- Secondly, the sustainability policy has been designed to provide a means to measure performance of the organization. While performance monitoring or benchmarking is not normally associated with sustainability, this document has been created with the intention that the goals and reporting requirements are designed around performance management across a wide range of disciplines.

The Yucaipa Valley Water District projected water use scenarios described in this Urban Water Management Plan represent viable options for the Districts future water use based on planning documents and projected water needs. A series of projects have already been implemented throughout the District and others planned as part of the annual Capital Improvement Budget adopted by the Yucaipa Valley Water District Board of Directors each year.

The most important projects identified by the District to address future water use would be the implementation of dual recycled water plumbing for new developments. This program is technically achievable and economically feasible due to the balance of new development water fees for constructing these facilities.

3.2.2 Describe Potential for Water Use Targets to be Implemented

Based on the strategic planning already adopted by the Yucaipa Valley Water District Board of Directors, the District is confident that the water use targets will be successfully implemented. One of the most important components of the strategic planning documents is the adopted prioritization of water to ensure the Yucaipa Valley Water District does not provide an opportunity for new development if water supplies are not readily available. The priorities for water supply are as follows:

- Priority One – Direct Delivery for Existing Customers. The direct delivery of imported water to meet the needs of existing potable water and non-potable water demands will be the highest priority of the District. This priority ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the existing direct delivery demand, imported water will be allocated to the next priority.

- Priority Two – Groundwater Adjudication Obligations. The District is responsible for meeting the obligations of groundwater adjudications in the Beaumont and Yucaipa Basins. This is the second highest priority to ensure sufficient storage and

replenishment obligations under court orders have been achieved. This priority also ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the first and second priorities, imported water will be allocated to the following priority.

- Priority Three – Groundwater Banking for Future Reliability. The Board of Directors will establish a groundwater banking of 15% of the total water used by District customers to recover our groundwater basins for future reliability. Each month, customers will be charged the cost for importing an additional 15% of the water consumed. The water will be stored in the groundwater basins to establish a credit and future drinking water supply to allow the community to use this local source during times of droughts and disruptions to the State Water Project. As with the first two priorities, this third priority also ensures sufficient water supply is allocated to meet current water demands, and is different from the Parcel Development Process needed for new development to occur. If the available supply of imported water exceeds the first, second and third priorities, imported water will be allocated to the following priority.

- Priority Four – Parcel Development Process. The Parcel Development Process provides for the storage of 7.0 acre feet per EDU for all new developments and 15.68 acre feet per EDU of imported water for the Crystal Status Development Program. This water is sufficient to clearly demonstrate a 20 year supply of water is available for the development to occur. The cost of imported supplemental water will be linked directly to the availability and anticipated cost for water delivered by either the San Bernardino Valley Municipal Water District or the San Gorgonio Pass Water Agency as established by the Yucaipa Valley Water District.

Based on this strategy, new development will contribute to the capital assets of the District as well as the water supply strategy to ensure a long-term and reliable water supply is available. This strategy allows the District to serve its customer's water demands entirely through groundwater or surface water allowing the District to insulate itself from periodic drought by utilizing available surface waters in wetter years relying more on groundwater in dryer years when surface water is less available. The District is able to switch between the two sources, or use both sources simultaneously, depending on hydrology and water availability.

Surface supply availability from the SWP, San Bernardino Basin Bunker Hill Pressure Zone, Seven Oaks Dam, Mill Creek and Santa Ana River can be used interchangeably, depending upon local and statewide hydrology, to supplement a stable local groundwater yield. Additionally, the District will incorporate recycled water delivery systems into new development, focusing service of new irrigation demands on recycled water. Recycled water will give the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of total supply. Overall, there are sufficient water resources to meet its current and projected growth in demands.

3.2.3 Low Income Projected Water Demands

The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).

As discussed above, the Yucaipa Valley Water District is confident that the water use targets established within this plan are achievable for all classes of customers. The water use projections also are applicable for single-family and multifamily residential housing needed for lower income households.

On November 7, 2007, the Yucaipa Valley Water District adopted Resolution No. 16-2007 that establishes policies and procedures for providing priority water and sewer service to affordable housing projects pursuant to California Government Code Section 65589.7. This Resolution provided the following:

1. Based upon availability of water and sewer service, as determined by the General Manager, the District will, to the extent reasonably feasible, grant priority to proposed developments that include housing units affordable to lower income households, as defined in Government Code Section 65589.7(d).

2. The District will devote its best efforts to plan and provide for water service and sewer connections for proposed developments that include housing units affordable to lower income households, taking into account (i) the housing element of the general plan adopted by each county or city within the District's boundaries, and (ii) other plans, documents, and information that provide a reasonable basis for making service determinations.

3. Applications for proposed developments that include housing units affordable to lower income households shall not be denied, nor shall conditions be imposed thereon or services which are applied for be reduced, unless the District makes specific written findings that the denial, condition, or reduction is necessary due to the existence of one or more of the following:

    a. Insufficient water supply or insufficient water treatment or distribution capacity;

    b. A State Department of Health Services order prohibiting new water connections;

    c. Insufficient sewer treatment or collection capacity;

    d. A Regional Water Quality Control Board order prohibiting new sewer connections; or

    e. The applicant has failed to agree to reasonable terms and conditions relating to the provision of service.

4. The District shall not discriminate in any manner when processing and considering requests for water or sewer service for developments that include housing units affordable to lower income households.

5. On or before July 1, 2011, and at least every five (5) years thereafter, the District shall adopt new or revised written policies and procedures, if necessary, with specific objective standards for the provision of water or sewer service on a priority basis with respect to developments that include housing units affordable to lower income households.

As part of the Urban Water Management Plan, the Yucaipa Valley Water District estimates the following lower income projections for water use.

Table 3-10 Low Income Water Use Projections

Description	2010	2015	2020	2025	2030	2035
Estimated Very Low and Low-Income Households Water Use	293.400	332.520	371.640	410.760	441.143	293.400

Senate Bill 1087 requires that water use projections of an Urban Water Management Plan include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The Yucaipa Valley Water District contains three primary jurisdictions that have been included in this planning process, the City of Yucaipa and the City of Calimesa, and unincorporated County of San Bernardino.

3.2.3.1 City of Yucaipa

The City of Yucaipa revised their Housing Element in November 2008. The City of Yucaipa's Housing Needs Assessment utilizes data from the 2000 U.S. Census, California Department of Finance (DOF), California Employment Development Department (EDD), Southern California Association of Governments (SCAG) and other relevant sources. Supplemental data was obtained through field surveys and from private vendors. A shortfall of lower-income sites compared to the City of Yucaipa's share of regional housing need was determined with the November 2008 Housing Element Study. The City of Yucaipa's Community Development Department will identify and rezone a minimum of 59 acres for multi-family development "as-of-right" at a density of 20-24 units/acre (excluding any density bonus) to bridge this gap. Rezoned sites will have a capacity of at least 16 units.

In 2000, approximately 1,835 extremely-low-income households resided in Yucaipa, representing 12.1% of the total households. The projected housing need for extremely-low-income households is assumed to be 50% of the very-low-income regional housing need of 476 units. As a result, the City has a projected need for 238 extremely-low-income units. The Yucaipa Valley Water District has determined approximately 80% of the City of Yucaipa's low income households fall within the service area of the Yucaipa Valley Water District. The remaining low income households will be located in service areas of South Mesa Mutual Water Company or Western Heights Mutual Water Company (Yucaipa Housing Element, November 2008).

3.2.3.2 City of Calimesa

Using these definitions, the Southern California Association of Governments (SCAG) estimated the distribution of City of Calimesa households by income category in the course of developing its Regional Housing Needs Assessment. SCAG's estimates indicate that the City of Calimesa's population is predominantly low and moderate income. This is further supported by

a citywide household income survey conducted by the City of Calimesa in 2004, which was funded by a CDBG Planning and Technical Assistance Grant that documented approximately 55 percent of the City's households as being lower income (i.e., low income, very low income and extremely low income).

Lower income households, in general, present a special housing need. These households are least able to afford increases in housing costs without sacrificing the purchase of food, medicine, clothing, or other essentials. Lower income households are also less likely to have funds available for home improvements, repairs, and maintenance (City of Calimesa, Housing Element 2006-2014). The Yucaipa Valley Water District has determined approximately 60% of Calimesa's Low Income Households fall within the service area of the Yucaipa Valley Water District. The remaining low income households will be located in the service area of the South Mesa Mutual Water Company.

3.3 Water Demand Projections

Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (California Water Code Section 10631(k)).

The Yucaipa Valley Water District receives imported water from the San Bernardino Valley Municipal Water District and the San Gorgonio Pass Water Agency. During the development of the Urban Water Management Plan, the Yucaipa Valley Water District worked closely with both wholesale agencies to develop their regional plans as well as supplement the Yucaipa Valley Water District's Plan.

Table 3-11 - State Water Contractors Serving Yucaipa Valley Water District

Description	San Bernardino Valley Municipal Water District	San Gorgonio Pass Water Agency
Formation Date	February 17, 1954	1961
Size of Service Area	325 square miles	225 square miles
Governing Act	Municipal Water District Act of 1911 - California Water Code Sections 71000	San Gorgonio Pass Water Agency Act, California Water Code Chapter 101
Maximum Annual State Water Project Entitlement	102,600 Acre Feet	17,300 Acre Feet
Number of Board Members	Five	Seven

Figure 3-6 – Delineation of Wholesale Service Areas for the Yucaipa Valley Water District

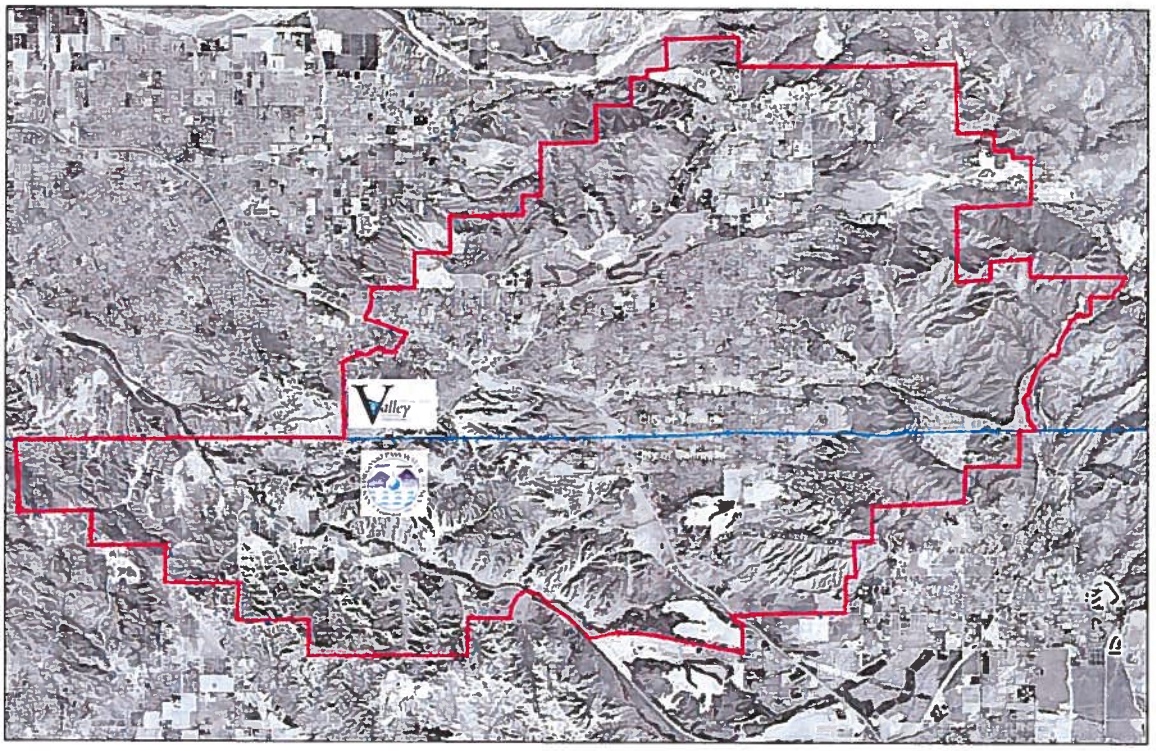


Table 3-12 – YVWD Demand Projections Provided to Wholesale Supplier San Bernardino Valley Municipal Water District

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	1,800.0	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
Conjunctive Use Demands: Local Water Banking	270.0	286.0	302.5	318.8	335.2	350.3
New Development Long-Term Supply Sustainability Program	43.3	391.0	381.0	396.0	356.0	368.0
Total	2,113.3	2,583.9	2,700.2	2,839.8	2,925.7	3,053.6

Units in million gallons per year.

Table 3-13 – YVWD Demand Projections Provided to Wholesale Supplier San Gorgonio Pass Water Agency

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	200.0	269.0	351.8	454.9	579.7	736.3
Conjunctive Use Demands: Local Water Banking	30.0	40.4	52.8	68.2	87.0	110.4
New Development Long-Term Supply Sustainability Program	2.3	266.0	333.0	398.0	503.0	607.0
Total	232.3	575.4	737.6	921.1	1,169.7	1,453.7

Units in million gallons per year.

3.4 Water Use Reduction Plan

Urban wholesale water suppliers shall include in the urban water management plans ... an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part (10608.36). Urban retail water suppliers are to prepare a plan for implementing the Water Conservation Bill of 2009 requirements and conduct a public meeting which includes consideration of economic impacts (California Water Code Section 10608.26).

3.4.1 Recycled Water

Recycled water demands currently comprise approximately 8.5 percent of the District's overall water demand. As documented within the Yucaipa Valley Water District Water Master Plan dated April 2002, the majority of the increase in the District's projected future water demands are for irrigation or other recycled uses. Water to serve such recycled demands does not need to be treated to the same standards as drinking water supplies since this demand is usually satisfied with recycled water.

To serve the projected growing recycled water demand, the Yucaipa Valley Water District has implemented an extensive dual water distribution system. The dual water system includes a potable water conveyance system to convey potable water (treated to comply with drinking water standards) to potable water customers. A separate recycled water distribution system conveys recycled supplies (treated to comply with body-contact and irrigation water standards) to recycled customers. Recycled water sources available to the Yucaipa Valley Water District include:

- Untreated imported water or untreated local surface water supplies;
- Backwash water from Yucaipa Valley Regional Filtration Facility; and
- Recycled water treated at the Henry N. Wochholz Regional Water Recycling Facility

The Yucaipa Valley Water District's recycled water distribution system serves commercial and institutional customers. The current recycled system extends westward from the Wochholz Regional Wastewater Recycling Facility to Crafton Hills College and southward to L Avenue in Yucaipa. The District's recycled water master plans envision expansion of the recycled water distribution system to serve the region's growing recycled water demand.

Anticipated growth will benefit from the recycled water distribution system. Yucaipa Valley Water District has adopted guidelines requiring dual plumbed systems on home lots equal to or exceeding 8,000 square feet.

3.4.2 Public Outreach

Yucaipa Valley Water District has an extensive public outreach campaign to inform and educate the community about water conservation. Successful water reduction throughout our service area can be achieved through proactive and invariable education opportunities for all members of the community.

The Yucaipa Valley Water District's Resource Sustainability Manager who oversees the multi-faceted public outreach program which consists of the following primary components:

Tours of District Facilities

- Yucaipa Valley Regional Water Filtration Facility – This facility tour informs attendees of YVWD's water source, water filtration process and the current water supply hurdles the District is currently facing and will face in the future. The tour also describes current and future water recycling methods necessary to ensure the growing community has an ample supply of water.
- Henry N. Wochholz Regional Water Recycling Facility – This facility tour describes the extensive treatment process of the community's wastewater. The tour also describes current and future water recycling methods necessary to ensure the growing community has an ample supply of water.

Classroom and Community Education Outreach

- YVWD partners with the Inland Empire Resource Conservation District (IERCD) to deliver multi-faceted education programs within the schools, grades K-12. IERCD conducts hands-on classroom presentations related to water conservation in order to expose students to California's water challenges and the process it takes for Southern California to obtain water for an arid environment.
- YVWD also participates in community events that have a substantial amount of residents in attendance. This participation gives YVWD a chance to inform a component of the community about the importance of residential water conservation.

3.4.3 Regional Collaboration

As a member of the San Bernardino Valley Municipal Water District's Regional Urban Water Management Plan, the Yucaipa Valley Water District routinely contributes toward the establishment of regional collaborative programs that benefit numerous water retailers in the Inland Empire Region. The regional alliance's water conservation programs consist of:

- Possible rebate programs for homeowners.
- Drought tolerant landscaping events and plant sales.
- Consistent messaging in the form of branding so consumers receive a dependable water conservation message.

Section 4

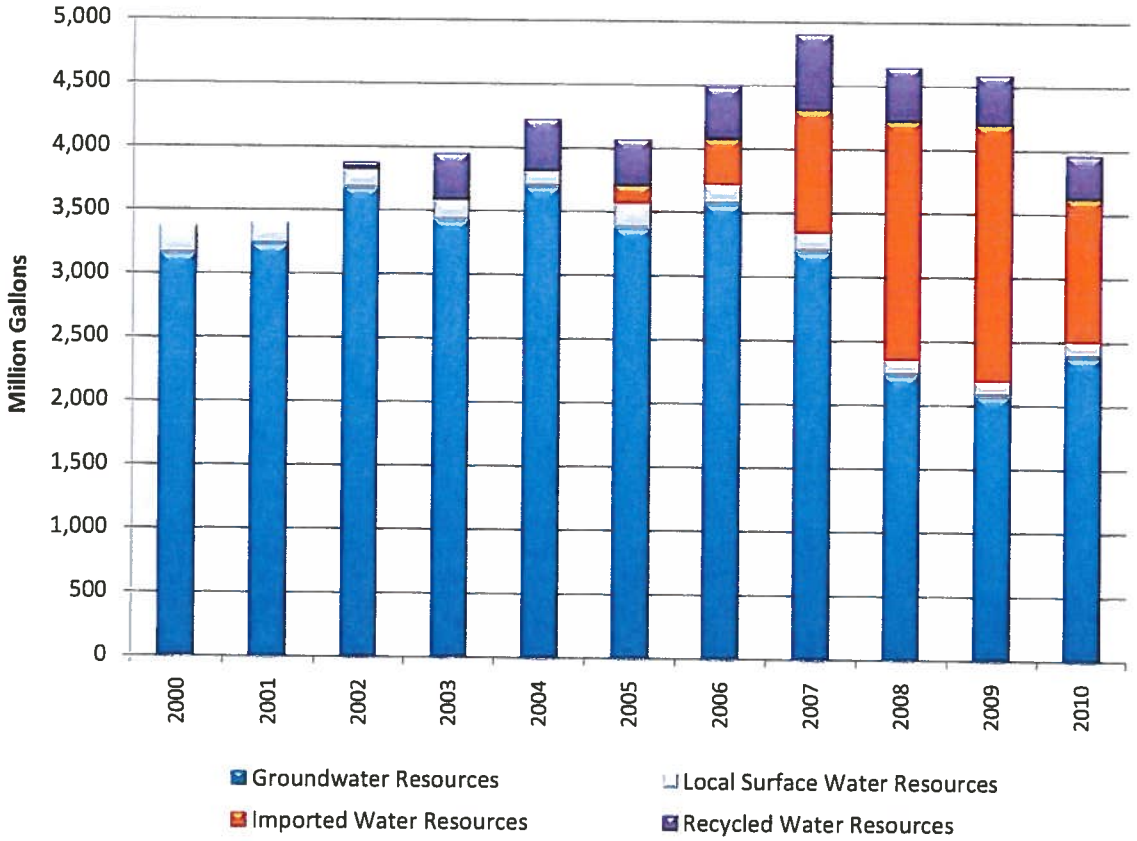
Water Sources and Supplies

4.1 - Water Resources

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments (California Water Code Section (a) (10631(b)).

The Yucaipa Valley Water District relies on four primary water resources to meet our annual water demands: groundwater resources, local surface water resources; imported water resources; and recycled water resources.

Figure 4-1 – Yucaipa Valley Water District Water Demand Sources



4.1.1 Groundwater Resources

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater. However, as shown above, the reliance on over-drafted local groundwater supplies has shifted to other water resources in recent years.

In 2000, groundwater resources provided 93.7% of the total water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 60.1% of the total water demands.

4.1.2 Local Surface Water Resources

The Yucaipa Valley Water District has operated and maintained surface water resources from the Oak Glen area since the early 1900's. The existing Oak Glen Surface Water Filtration Facility continues to produce a steady flow of high quality drinking water for the Yucaipa Valley.

In 2000, local surface water supplies provided 6.3% of the total water demands of the Yucaipa Valley Water District. By 2010, this source supplied 3.0% of total water demands.

4.1.3 Recycled Water Resources

In 2002, the Yucaipa Valley Water District started to provide non-potable water service to the Yucaipa Valley. This system started with the use of untreated imported water from the State Water Project and changed to a recycled water source as backwash water was treated at the Yucaipa Valley Regional Water Filtration Facility. By 2014, the Yucaipa Valley Water District will be utilizing recycled water from the Wochholz Regional Water Recycling Facility to meet the recycled water irrigation demands.

The recycled water system continues to grow with the addition of new infrastructure and new customers. In 2000, local recycled water resources were not utilized to meet the water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 8.6% of the total water demands in the Yucaipa Valley.

4.1.4 Imported Water Resources

While the Yucaipa Valley Water District began to utilize imported water in 2002 to meet non-potable water demands, it was not until 2005 when the Yucaipa Valley Water District first operated a water filtration facility to produce drinking water from imported water resources delivered to the Yucaipa Valley Water District from the San Bernardino Valley Municipal Water District (which serves portions of the Yucaipa Valley Water District in San Bernardino County) and the San Gorgonio Pass Water Agency (which serves portions of the Yucaipa Valley Water District in Riverside County).

In 2000, imported water resources were not utilized to meet the water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 28.2% of total water demands.

4.2 Planned Water Resources

The Yucaipa Valley Water District has adopted sustainability concepts that rely heavily on the use of recycled water to help meet the future water demands of the District. Additionally, the Yucaipa Valley Water District will carefully utilize imported water from the San Bernardino Valley

Municipal Water District and the San Gorgonio Pass Water Agency to establish groundwater banking programs and conjunctive use operations in the Yucaipa Valley. The aggressive use of recycled water and the carefully executed use of imported water will provide the Yucaipa Valley Water District with a long-term, reliable water supply for the future.

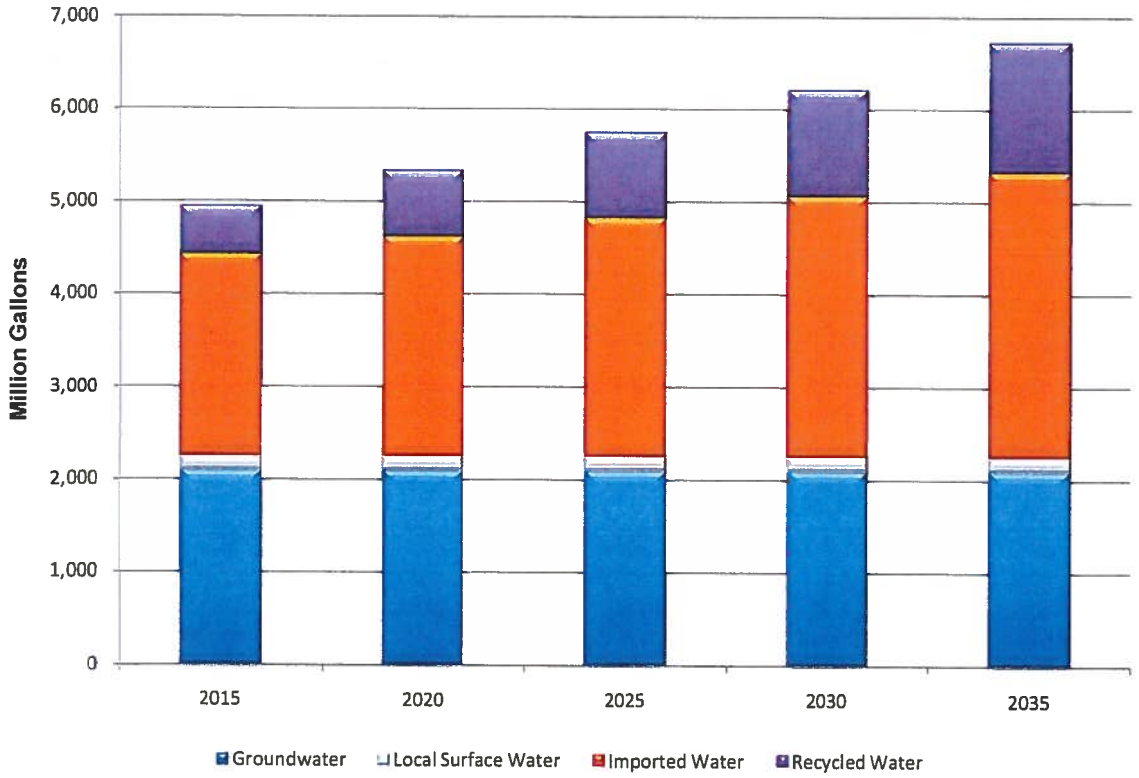
The Yucaipa Valley Water District envisions a long-term water supply that is based on an average of one-third groundwater resources, one-third recycled water resources, and one-third imported water resources. This water resource portfolio relies on the ability to recharge local groundwater basins during wet periods while increasing groundwater use during drought cycles. This concept is further discussed in the following sections of the Urban Water Management Plan.

Table 4-1 - Summary of Planned Water Resources

Water Source	2015	2020	2025	2030	2035
Groundwater Resources	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0
Local Surface Water Resources	147.5	147.5	147.5	147.5	147.5
Imported Water Resources	2,175.9	2,368.5	2,580.0	2,814.2	3,071.7
Recycled Water Resources	516.5	709.1	920.5	1,154.8	1,412.2
Total Water Resources	4,939.9	5,325.1	5,748.0	6,216.5	6,731.4

Units are in million gallons

Figure 4-2 - Yucaipa Valley Water District's Planned Water Resources



The following table illustrates the projected water supplies for the Yucaipa Valley Water District.

Table 4-2 - Detailed Current and Projected Water Supplies

Water Source	2010	2015	2020	2025	2030	2035
Groundwater Resources:						
Groundwater Extracted by YVWD	2,378.5	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0
Local Surface Water Resources:						
Oak Glen Surface Water Filtration Facility	120.4	147.5	147.5	147.5	147.5	147.5
Imported Water Resources:						
San Bernardino Valley Municipal Water Dist.	1,500.9	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
San Gorgonio Pass Water Agency	40.1	269.0	351.8	455.0	579.7	736.3
Recycled Water Resources:						
YVRWFF Recycled Water Source	340.6	0.0	0.0	0.0	0.0	0.0
WRWRF Recycled Water Source	0.0	516.5	709.1	920.5	1,154.8	1,412.2
Transfers In	0.0	0.0	0.0	0.0	0.0	0.0
Exchanges In	0.0	0.0	0.0	0.0	0.0	0.0
Desalinated Drinking Water	0.0	0.0	0.0	0.0	0.0	0.0
Total Water Resources	3,957.3	4,939.9	5,325.1	5,748.0	6,216.5	6,731.3

Units are in million gallons

- *YVRWFF - The Yucaipa Valley Regional Water Filtration Facility produces treated backwash water that is currently used as a recycled water source.*
- *WRWRF - The Wochholz Regional Water Recycling Facility will produce advanced tertiary treated recycled water that will replace the recycled water currently produced by the Yucaipa Valley Regional Water Filtration Facility.*

4.3 Groundwater

Is groundwater . . . identified as an existing or planned source of water available to the supplier . . . (California Water Code Section 10631(b))

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater through the use of the Yucaipa Valley Water District's groundwater extraction wells. In 2010, over 75% of the groundwater used by the Yucaipa Valley Water District was extracted from the Wilson Creek Basin and the Calimesa Basin. The remaining groundwater production was from the Beaumont Basin, Chicken Hill Basin, Triple Falls Creek Basin, Oak Glen Basin and the Wildwood Basin.

Provide a detailed description and analysis of the location, amount and sufficiency of groundwater pumped b the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records. (California Water Code Section 10631(b)(3))

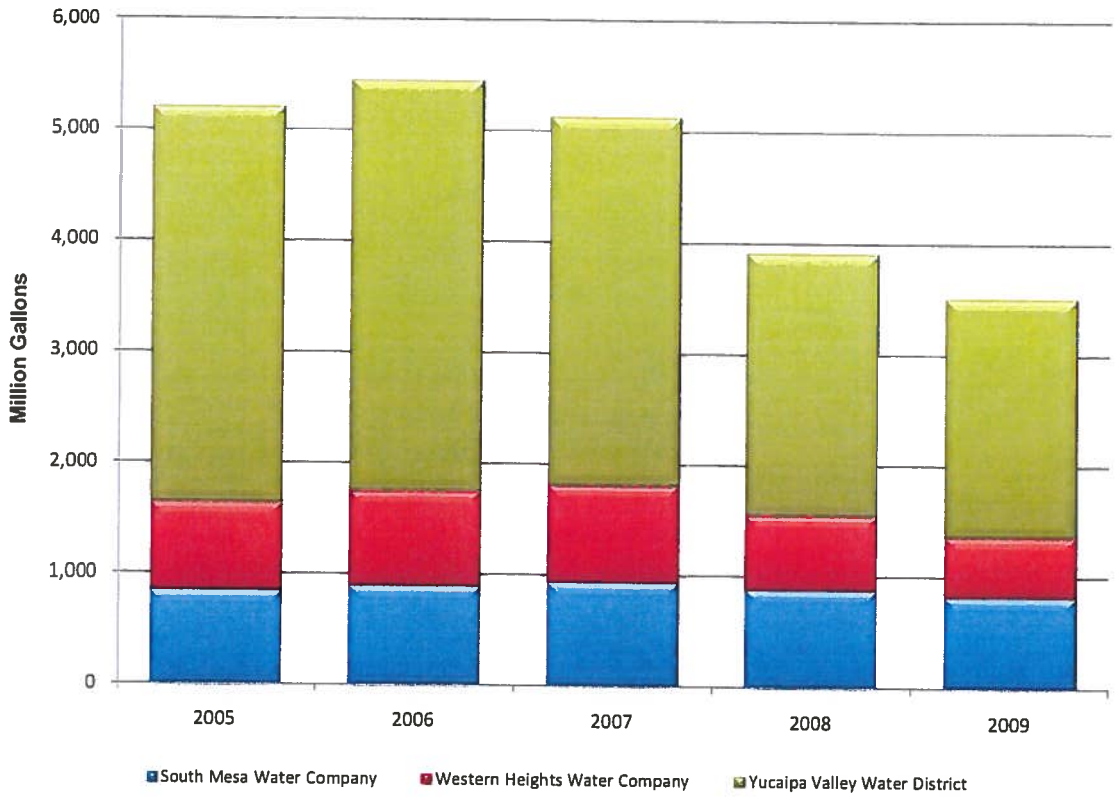
Since about 1970 and especially during the 1990's, the widespread urbanization of Southern California has extended into the Yucaipa area. Undeveloped land, agricultural land, and sparsely populated residential land has been converted into tracts of single family homes. The net effect of this change in land use has been an increase in the demand for water.

Since the local supply of surface water and groundwater is limited in this semi-arid region, water purveyors in the Yucaipa Valley have explored several alternatives related to the development of water resources in the area. Most studies have identified groundwater resources at 200-300

feet below the surface elevation with a general basin-wide movement of both surface water and groundwater from the surrounding hills and mountains, to the south and west. After a brief study of the area, it becomes apparent to most observers that on a localized scale, the movement of groundwater through the numerous faults is very complex.

The quantity and quality of groundwater in the area has generally been sufficient to meet the demands of the Yucaipa Valley over the past fifty years.

Figure 4-3 Appropriative Groundwater Extractions within the Yucaipa Valley Water District Sphere of Influence



The groundwater extractions by appropriators in the sphere of influence of the Yucaipa Valley Water District have decreased over the past five years. This is mainly attributed to the increased use of recycled water and imported water in the region. Overall, the three appropriators in the Yucaipa Valley are progressing towards a balanced safe yield of groundwater extractions at about 3,000 million gallons per year.

Provide a description of any groundwater basin or basins from which the urban water supplier pumps groundwater. (California Water Code Section 10631(b)(2))

As discussed above, the overall water demand in the region has increased, but the amount of groundwater used to meet the demands has decreased. Technically, most of the groundwater basins in the Yucaipa Valley area considered in an overdraft situation, but significant efforts have been made by the Yucaipa Valley Water District to increase the amount of water in storage in the central part of the Yucaipa Valley.

Groundwater projection in the Yucaipa Valley generally is associated with three primary groundwater basins, the Yucaipa, San Timoteo and Beaumont Basins. The Yucaipa Basin is divided into a series of eight subbasins separated by faults and other physical barriers:

- Calimesa Basin
- Chicken Hill Basin
- Gateway Basin
- Oak Glen Basin
- Triple Falls Basin
- Western Heights Basin
- Wilson Basin
- Wildwood Basin

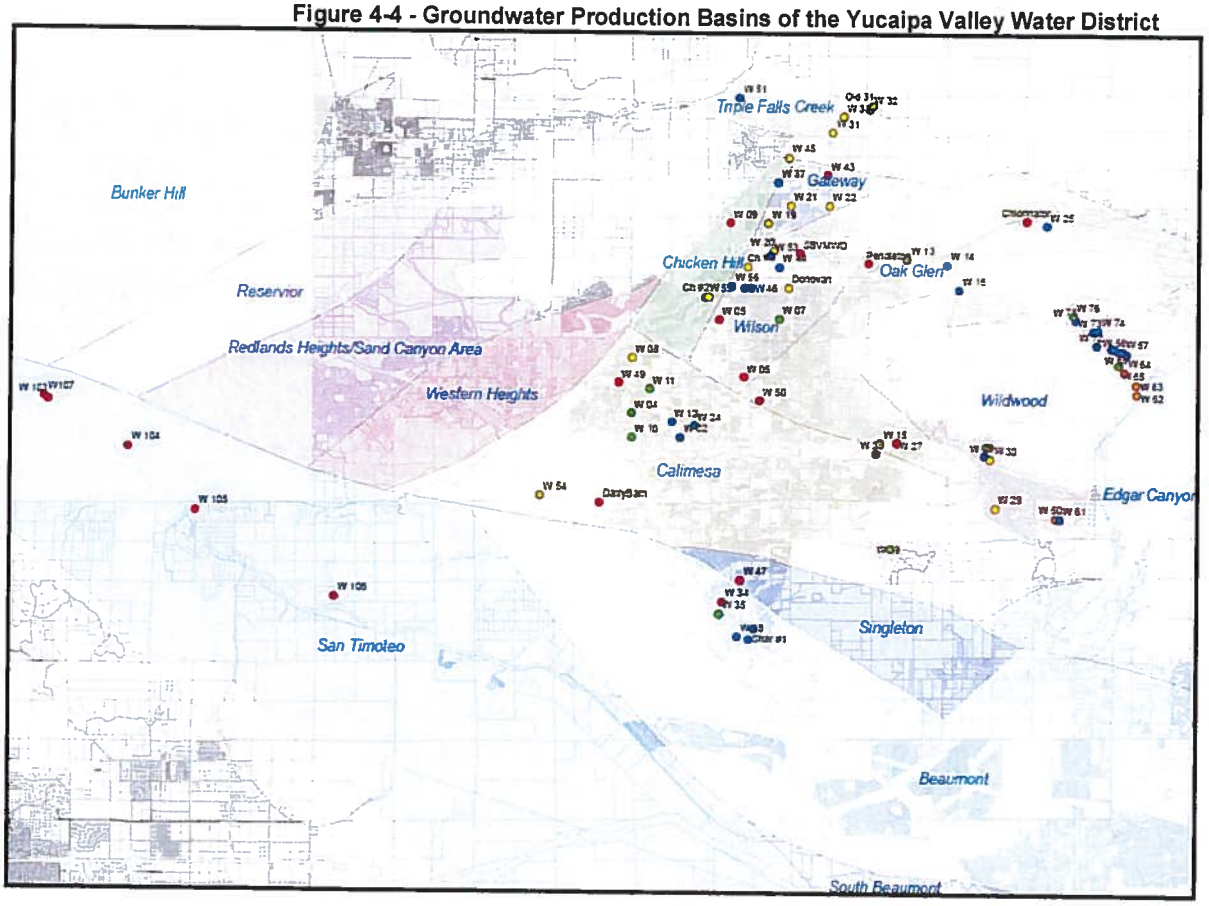
Other local groundwater basins operated and managed by the Yucaipa Valley Water District include: the San Timoteo Groundwater Basin; the Beaumont Groundwater Basin and the Singleton Groundwater Basin. The Department of Water Resources recognizes the Beaumont and San Timoteo Basin as one basin, the San Timoteo Subbasin.

Table 4-3 - Groundwater Basins in the YVWD Service Area

Groundwater Basin	Acres	Square Miles
Beaumont	17,035.48	26.62
Calimesa	6,627.40	10.36
Chicken Hill	1,043.65	1.63
Edgar Canyon	5,187.77	8.11
Gateway	570.05	0.89
Oak Glen	5,193.71	8.12
Sand Canyon	3,849.26	6.01
San Timoteo	31,131.42	48.64
Singleton	2,033.47	3.18
Triple Falls	1,632.30	2.55
Western Heights	2,601.53	4.06
Wildwood	4,980.71	7.78
Wilson	1,846.08	2.88

The following figure illustrates the complexity of the Yucaipa groundwater subbasins and their proximity to the Beaumont Basin and the San Timoteo Basin.

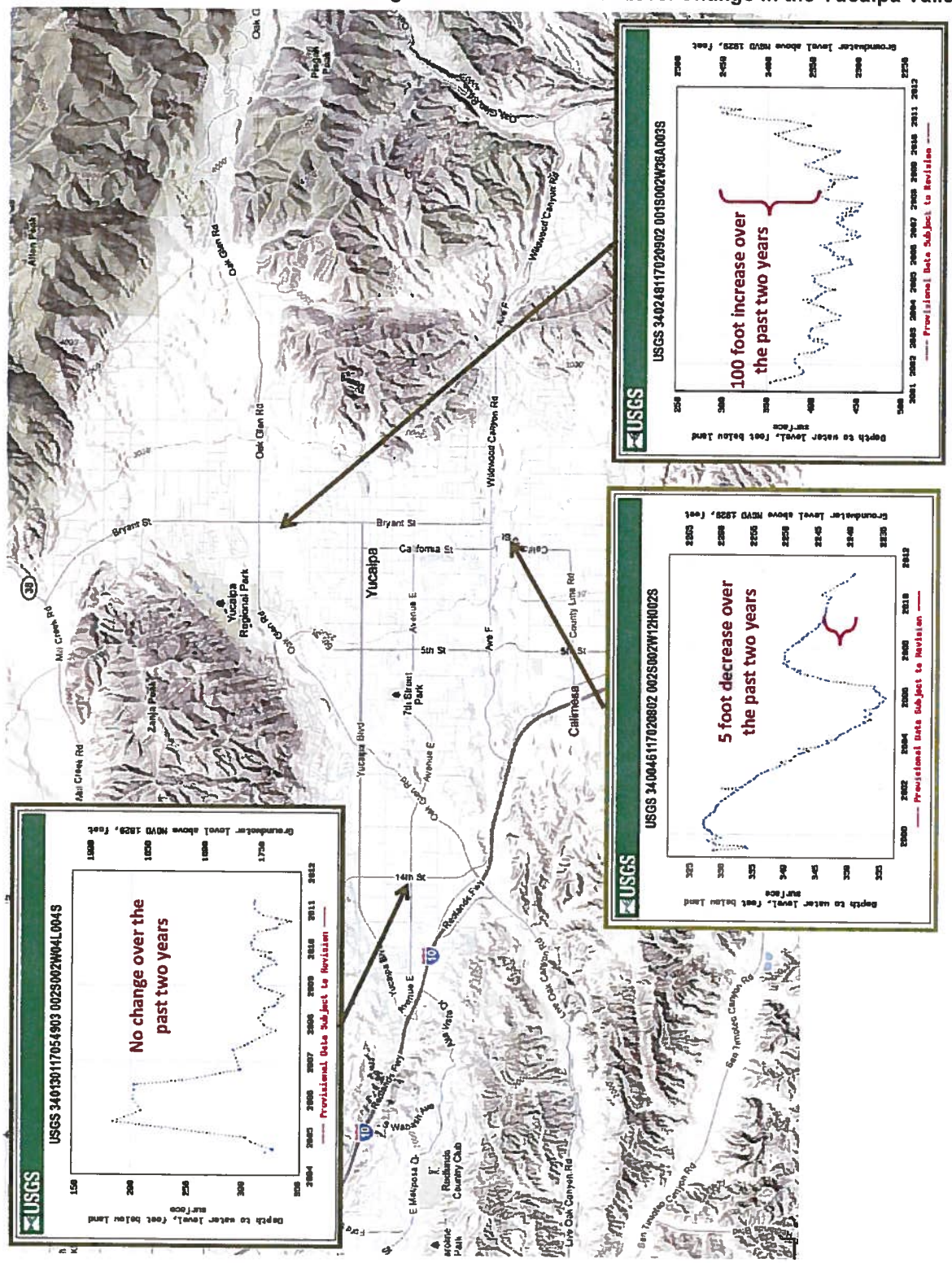
Figure 4-4 - Groundwater Production Basins of the Yucaipa Valley Water District



The Yucaipa Valley Water District relies on each of the underlying groundwater basins for groundwater management and resource protection under the maximum benefit objectives established by the Regional Water Quality Control Board.

As part of the management planning, the Yucaipa Valley Water District monitors the groundwater levels within each basin to protect the long-term quality and quantity of water available for our customers.

Figure 4-5 - Groundwater Level Change in the Yucaipa Valley



The following charts illustrate the variations of groundwater production by each subbasin within the Yucaipa Valley Water District Sphere of Influence.

Figure 4-6 - 2005 Groundwater Production by Subbasin

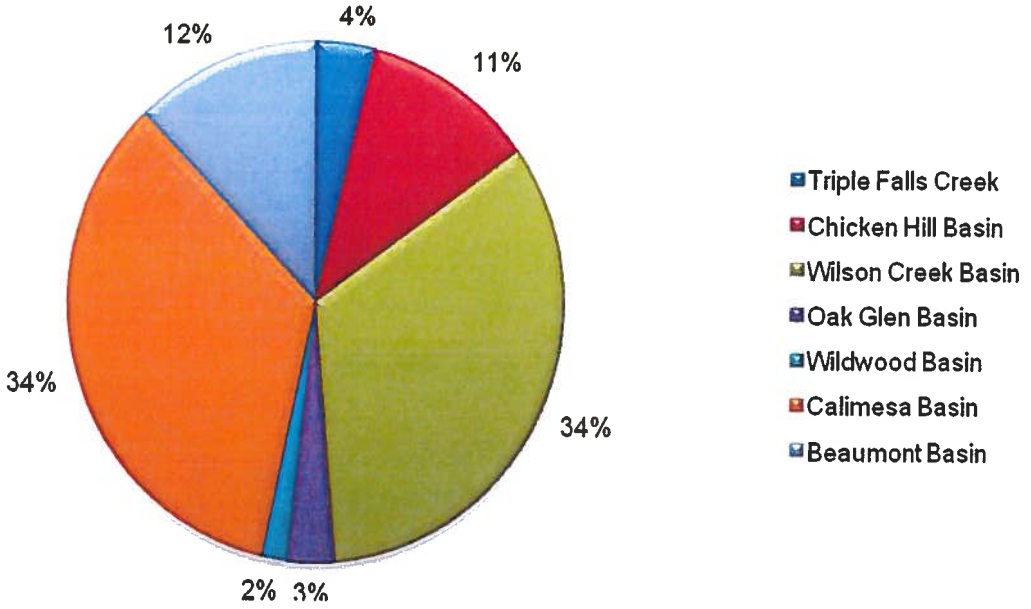
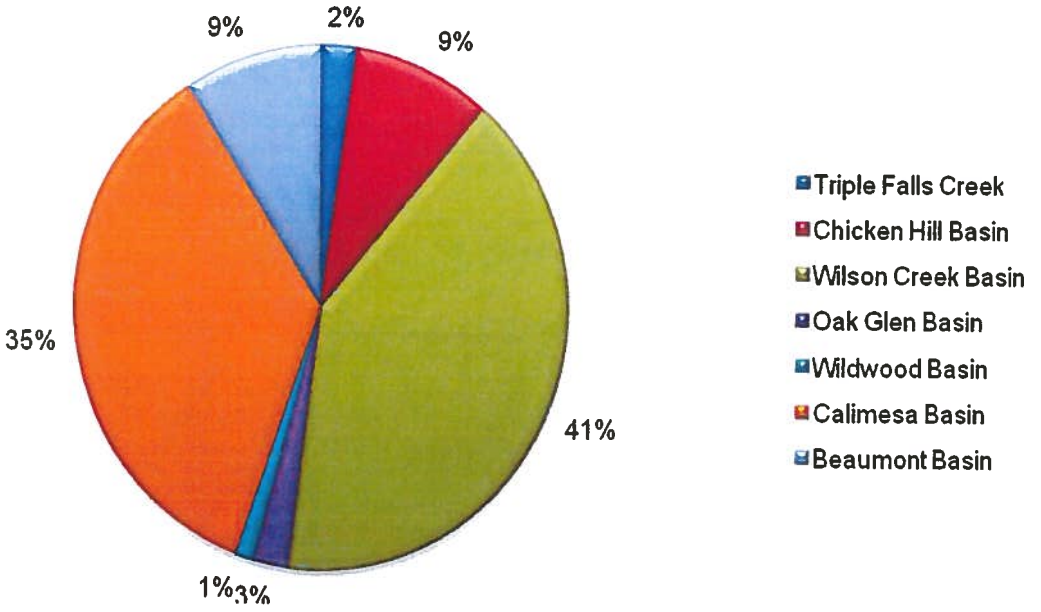
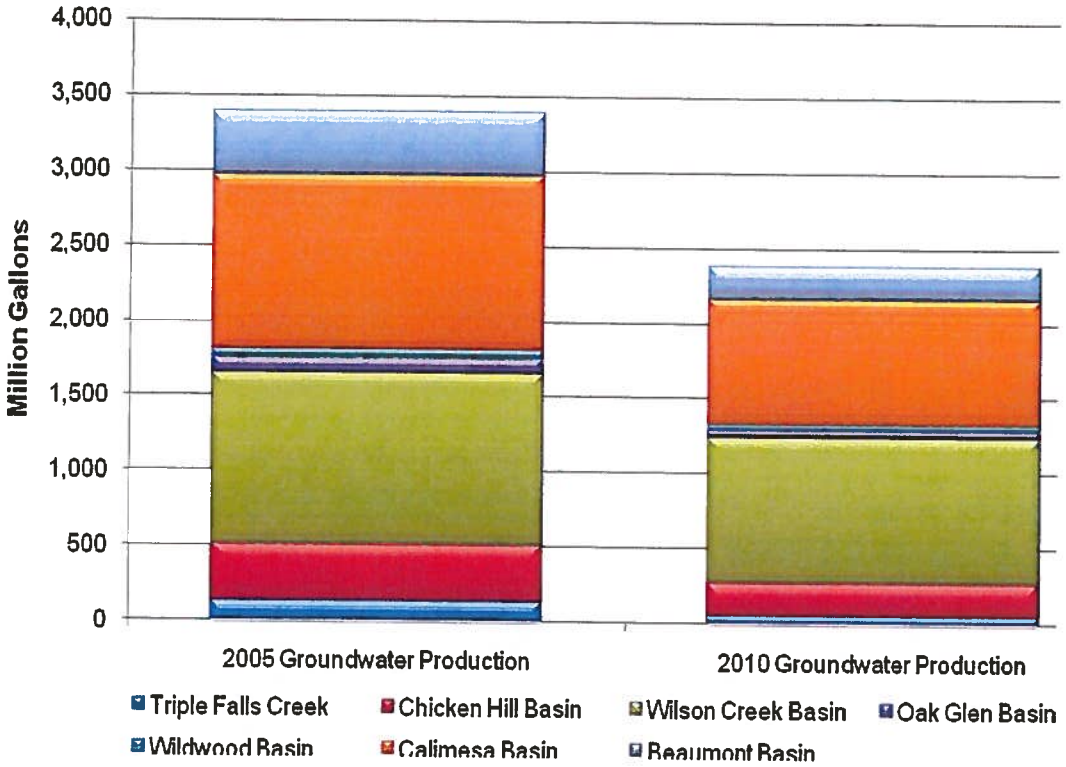


Figure 4-7 - 2010 Groundwater Production by Subbasin



The following charge illustrates the difference in total groundwater production from 2005 to 2010 as well as the location of groundwater production within the District's service area.

Figure 4-8 - Groundwater Production Comparison 2005 to 2010



The following table provides a detailed description of the three major groundwater basins within the service area of the Yucaipa Valley Water District.

Table 4-4 - Summary of Groundwater Basin Hydrogeologic Characteristics

Parameter	Yucaipa Basin	Beaumont Basin	San Timoteo Basin
Basin Area	41 square miles[2]	26 square miles[1,3]	49 square miles
Groundwater formations	Alluvium[1,4]	Alluvium[1,4]	Alluvium[1,4]
Depth of water bearing sediments	700 - 1000 feet[1,5]	700 - 1,000 feet[1,5]	700 - 1,000 feet[1,5]
Typical Specific Yields	4 - 22 percent[1,6] (10 percent average)	3 - 35 percent[1] (11 percent average)	3 - 35 percent[1] (11 percent average)
Groundwater Storage Capacity	800,000 acre-feet[1,7]	1,000,000 acre-feet[1,8]	1,000,000 acre-feet[1,8]
Estimated Long-term Natural Recharge	8,000 AFY[1,9]	8,560 AFY[1,10]	> 20,000 AFY[1,11]
Current Approximate Extractions	14,000 AFY[1]	16,000 AFY[1,12]	Not Available[13]
Dominant Recharge Source	Stream flow infiltration[1,14]	Stream flow infiltration and artificial Recharge[1]	Stream flow infiltration, subsurface inflow, and deep percolation[1]
Artificial Recharge Potential	7000-14,000 AF[1]	200,000 AF[1,15]	Not Available[13]
Typical Well Yields	200 gpm (average)[1]	200 gpm (average)[1]	Not Available[13]
Maximum Well Yields	2,800 gpm[1]	2,000 gpm[1,16]	Not Available[13]
Typical Municipal Well Depths	500 feet[1]	500 feet[1]	500 feet[1]
Typical Range of TDS concentration	200 - 630 mg/l[1]	170 - 340 mg/l[1]	Not Available[13]
Average Groundwater TDS	320 mg/l[1]	250 mg/l[1]	Not Available[13]

1 From DWR Bulletin No. 118 (*California's Groundwater*, 2004).
2 Water bearing sediments cover approximately 29 square miles (19,000 acres) within the Yucaipa Basin. The total watershed area of the basin is approximately 39 square miles (25,000 acres).
3 Water bearing sediments cover approximately 26 square miles (16,000 acres) within the Beaumont Basin. The total combined watershed area of the Beaumont and San Timoteo Basins is approximately 114 square miles (73,000 acres).
4 Includes recent alluvium from Holocene age, older Pleistocene age alluvium, and alluvial deposits within the eroded and folded Pliocene-Pleistocene age sediments of the San Timoteo Formation.
5 San Timoteo Formation depths extend to 1500 to 2000 feet, but water-bearing sediments appear limited to depths of 700 to 1000 feet.
6 Lowest specific yields are reported northeast of Yucaipa. In the southern part of the basin, specific yields are estimated to range from 6 to 22 percent, with an average of 10 percent.
7 Storage capacity estimates reported by DWR Bulletin No. 118 range from approximately 800,000 AF to 1.2 million AF.
8 Total combined storage capacity of the Beaumont and San Timoteo Basins is estimated at 2,000,000 by DWR. Approximately one-half of this capacity is in the Beaumont Basin and one half is in the San Timoteo Basin.
9 Approximate long-term yield presented in DWR Bulletin No. 118 on the basis of studies performed in 1980. A 1988 study performed for YVWD entitled *Perennial Yield of the Yucaipa Groundwater Basin* (David Keith Todd Consulting Engineers, 1988) estimated a long-term yield of approximately 7,900 AFY.
10 Long-term yield estimated at 8,650 AFY, as reported in the FY2005-2006 annual Beaumont Basin Watermaster Report.
11 Estimate not available. Recharge estimates for the combined San Timoteo/Beaumont Basins provided within DWR Bulletin No. 118 suggest that the total long-term recharge to the San Timoteo Basin is in excess of 20,000 AFY.
12 Annual production has ranged from 14,100 AFY to 19,300 AFY during the period FY2003-04 and FY2006-07, as reported in the FY 2006-07 Beaumont Basin Watermaster report.
13 Estimated value not available for the San Timoteo Basin.
14 Infiltration from Yucaipa, Wilson, and Oak Glen Creeks, predominantly in the north and eastern portions of the basin.
15 Estimated by Beaumont Basin Watermaster in annual report for FY2006-07.
16 Based on pumping data presented in the Beaumont Basin Watermaster FY 2006-2007 Annual Report, adjusted by an assumed 70 percent operational factor.

4.3.1 Yucaipa Groundwater Basin

The Yucaipa Groundwater Basin is located in the Santa Ana Subregion of the South Coast Hydrologic Region within the County of San Bernardino. The Yucaipa Basin has a surface area of 25,300 acres (DWR Bulletin 118) and a capacity of 800,000 AF (Groundwater Water Recharge/Recovery Project, 2009). The Basin is bounded on the north by the San Andreas fault, on the west by the Redlands fault and the Crafton Hills, on the south by the Banning fault, and on the east by the Yucaipa Hills.

Alluvial deposits in the subbasin are divided into older and younger units. The Holocene age younger alluvium consists of unconsolidated boulders, gravel, sand, silt, and clay (Moreland 1970). This unit forms a thin veneer and is mostly above the water table (Moreland 1970). The middle to late Pleistocene age older alluvium consists of boulders, gravel, sand, silt, and clay (Moreland 1970), and holds the primary source of groundwater in the subbasin. Clays present in this section are due to weathering and soil formation during accumulation of the deposits (DPW 1934).

The 2003 California Department of Water Resources Bulletin 118-2003 identifies the Basin in overdraft. Although the basin is defined in an overdraft state; water levels are at or near historic highs (California's Groundwater Bulletin 118, 2004). Moreover, the Yucaipa Valley Water District has decreased groundwater pumping dramatically since 2007 attributable to the supplemental supply of State Water Project Water and the use of recycled water. Prior to importing State Water Project water, Yucaipa Valley Water District pumped 3,585 million gallons per year (YVWD 2005 Production Report). Incorporating supplemental water has reduced pumping by 50% (YVWD 2010 Production Report).

The Yucaipa Groundwater Basin is subdivided into several subbasins including the: Calimesa, Chicken Hill, Gateway, Oak Glen, Singleton, Triple Falls Creek, Western Heights, Wildwood and Wilson Subbasin.

Calimesa Subbasin - The Calimesa subbasin along with the Wilson Creek subbasin are the two largest subbasins within the Yucaipa Groundwater Basin. Total capacity of the Calimesa subbasin is estimated at 175,000 acre-feet (Groundwater Water Recharge/Recovery Project, 2009). The safe yield of the basin is small compared to this storage capacity, and is estimated at 1,500 million gallons per year, or 4,600 acre feet per year (Wildermuth, 2005). Groundwater is typically reached within 225-350 feet below the land surface (Wildermuth, 2005).

Chicken Hill Subbasin - The Chicken Hill subbasin is located in the northwest portion of the Yucaipa Basin. The subbasin has a total of five wells with two of those wells being active as of December 2010.

Gateway Subbasin - The Gateway subbasin is located in the northern portion of the Yucaipa Basin. Currently there are no active wells in use as of December 2010. The Gateway subbasin contains three abandoned wells and one monitoring well.

Oak Glen Subbasin - The Oak Glen Subbasin is located in the Northeastern portion of the Yucaipa Basin while extending south between the Wilson and Wildwood Subbasins as it straddles the mountain range to the east. The subbasin represents one of the

Exhibit D

California Regional Water Quality Control Board
Santa Ana Region

Linda S. Adams
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

February 3, 2010

Dr. Matt A. Yeager, D. Env
Storm Water Program Manager
San Bernardino County Flood Control District
825 E. Third Street, Room 201
San Bernardino, CA 92415

WASTE DISCHARGE REQUIREMENTS FOR THE COUNTY OF SAN BERNARDINO AND THE INCORPORATED CITIES OF SAN BERNARDINO COUNTY, ORDER NO. R8-2010-0036, NPDES NO. CAS618036, AREAWIDE URBAN STORM WATER RUNOFF

Dear Dr. Yeager,

Enclosed is a certified copy of Order No. R8-2010-0036, NPDES No. CAS 618036. This order renews waste discharge requirements for the discharge of urban storm water from areas of San Bernardino County within the Santa Ana Region to waters of the U.S. This order was adopted at a public hearing during the January 29, 2010 Board meeting. Please note that Order No. R8-2010-0036 expires on January 29, 2015 and a Report of Waste Discharge must be filed no later than 180 days in advance of that expiration date.

If you have any questions, please call Maria Macario at (951) 321-4583.

Sincerely,

Gerard J. Thibeault
Executive Officer

Enclosures: Adopted Order No. R8-2010-0036 w/ attachments

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

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ORDER NO. R8-2010-0036
NPDES NO. CAS618036

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, THE COUNTY OF SAN BERNARDINO, AND THE INCORPORATED CITIES OF SAN BERNARDINO COUNTY WITHIN THE SANTA ANA REGION

AREA-WIDE URBAN STORM WATER RUNOFF MANAGEMENT PROGRAM

The following Dischargers (Table 1) are subject to waste discharge requirements as set forth in this Order:

Table 1. Municipal Permittees

Principal Permittee	San Bernardino County Flood Control District (SBCFCD)	
Co-Permittees	1. County of San Bernardino	9. City of Loma Linda
	2. City of Big Bear Lake	10. City of Montclair
	3. City of Chino	11. City of Ontario
	4. City of Chino Hills	12. City of Rancho Cucamonga
	5. City of Colton	13. City of Redlands
	6. City of Fontana	14. City of Rialto
	7. City of Grand Terrace	15. City of San Bernardino
	8. City of Highland	16. City of Upland
		17. City of Yucaipa

The Principal Permittee and the Co-Permittees are collectively referred to as the Permittees or the Dischargers.

Table 2. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**January 29, 2010**
This Order shall become effective on:	**January 29, 2010**
This Order shall expire on:	**January 29, 2015**
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a major discharge.	
The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

IT IS HEREBY ORDERED, that this Order supersedes Order No. R8-2002-012 except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Dischargers shall comply with the requirements in this Order.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 29, 2010.

Gerard J. Thibeault, Executive Officer

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I. FACILITY INFORMATION

A. Each of the Permittees listed in Table 1, above, owns and/or operates storm water and urban runoff conveyance systems, including flood control facilities. These conveyance systems are commonly referred to as municipal separate storm sewer systems (MS4s[1]) or storm drains, through which storm water and urban runoff are discharged into waters of the United States (Waters of the U.S.) that are located within the Santa Ana Region. Some of the natural channels, streambeds and other drainage facilities that are generally considered as Waters of the U.S. have been converted to flood control facilities. In such cases, where a natural streambed is modified to convey storm water flows, the conveyance system becomes both an MS4 and a water of the U.S. The primary purpose for which these MS4s were constructed was for flood control to minimize threat to public safety and property damage. 40 CFR 122.26(b) categorizes MS4s as follows: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) an MS4 which contributes to a violation of a water quality standard; (3) an MS4 which is a significant contributor of pollutants to waters of the United States; or (4) an MS4 owned and/or operated by a small municipality that is interrelated to a medium or large municipality. Urban Runoff[2] from these MS4 systems must be regulated under a National Pollutant Discharge Elimination System (NPDES) permit as per Section 402(p) of the federal Clean Water Act (CWA).

B. This Order regulates the discharge of pollutants (as defined in Attachment 4, Glossary) in Urban Runoff from anthropogenic (generated from non-agricultural human activities) sources from MS4s that are either under the jurisdiction of the Permittees, and/or where Permittees have MS4 maintenance responsibility, or have authority to approve modifications of the MS4s. Urban Runoff includes those discharges from residential, commercial, industrial and construction areas within the permitted area and excludes discharges from feedlots, dairies, and farms or other agricultural activities. The Permittees have jurisdiction over and/or maintenance responsibility for storm water conveyance systems within San Bernardino County. The Permittees lack legal jurisdiction over storm water discharges into their systems from State and federal facilities, e.g., schools and hospitals, utilities and special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Regional Board. The Regional Board recognizes that the Permittees should not be held responsible for such facilities and/or

[1] A MS4 (municipal separate storm sewer system) system is any conveyance or a system of conveyances designed to collect and transport storm water which is not part of a Publicly Owned Treatment Works (i.e., not a combined sewer).

[2] Urban runoff is defined as all flows in a storm water conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) authorized non-storm water discharges

discharges. The Regional Water Board will coordinate with these entities to implement programs that are consistent with the requirements of this Order. The Regional Board, pursuant to 40 CFR 122.26(a), has the discretion and authority to require non-cooperating entities to participate in this Order. The Regional Board may also consider such facilities for coverage under its NPDES permitting scheme pursuant to USEPA Phase II storm water regulations.

C. To the extent that the Permittees authorize the connection of these discharges into their MS4s, this Order requires the Permittees to provide written notification of Water Quality Management Plan (WQMP) requirements for post-construction BMPs and/or other applicable requirements of this Order. A WQMP approved by the Permittee who owns the MS4 may constitute compliance with the General Construction Permit post-construction requirements[3] for the Permit Area.

D. Certain activities that generate pollutants present in storm water runoff may be beyond the ability of Permittees to prevent or eliminate. Examples of these include, but are not limited to: emissions from internal combustion engines, brake pad and tire wear, atmospheric deposition, bacteria from wildlife (including feral dogs and cats) or from bacterial resuscitation or reactivation from treated waters or growth of bacteria in the environment (such as in sediments, surface water, or other substrate), and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring pollutants or flows.

E. The Permittees serve a population of approximately 1.5 million[4] (75% of the County population), occupying an area of approximately 620 square miles[5]. The permitted area is shown on Attachment 1.

F. The Permittees' MS4 systems include an estimated 378 miles of above-ground channels and 485 miles of underground storm drain channels, for a total of 863 miles within the permitted area. Approximately seven percent (7%) of the San Bernardino County area drains into water bodies within this Regional Board's jurisdiction. This Order regulates urban and storm water runoff from areas within the Santa Ana Regional Board's jurisdiction. Approximately 50% of the remaining San Bernardino County drainage areas are within the jurisdiction of the Lahontan Regional Board. Urban and storm water runoff from those areas is regulated by the Lahontan Regional Board. The other 43% is within the jurisdiction of the Colorado River Basin Regional Board. The Colorado River Basin Regional Board regulates urban and storm water runoff from those areas. As indicated above, most of the urbanized areas of San Bernardino County are located within the Santa Ana Regional Board's jurisdiction.

[3] The State General Construction Permit Order No. 2009-0009-DWQ Section XIII.
[4] Per 2006 Report of Waste Discharge (ROWD).
[5] Per 2006 ROWD.

II. FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter the Regional Board) finds that:

A. Background

1. The Co-Permittees own and operate flood control facilities.
2. The discharge of Urban Runoff from the San Bernardino County areas within the Santa Ana Region is currently regulated under Order No. R8-2002-0012, National Pollutant Discharge Elimination System (NPDES) Permit No. CAS 618036. Order No. R8-2002-0012 expired on April 27, 2007 and was administratively extended until adoption of this Order in accordance with Title 23, Division 3, Chapter 9, §2235.4 of the California Code of Regulations.
3. The Permittees jointly submitted a Report of Waste Discharge (ROWD) on October 26, 2006, as application to renew their NPDES permit. To effectively carry out the requirements of this Order, the Permittees have agreed that the San Bernardino County Flood Control District (SBCFCD) will continue as the Principal Permittee and the County and the 16 incorporated cities will continue as the Co-Permittees.
4. The ROWD proposed revisions to the Municipal Storm Water Management Plan (MSWMP) that includes performance commitments for each program element, letters of intent from each of the eighteen Permittees listed in Table 1, and proposed activities to be conducted during the fourth term permit. The MSWMP incorporated a number of other documents by reference. The ROWD, the letters of intent, the MSWMP and the documents referenced therein are hereby made enforceable elements of this Order. The ROWD included: (a) a summary of accomplishments; (2) discharge characterization; (3) program effectiveness analysis; and (4) recommendations for program improvements.
5. This Order, Order No. R8-2010-0036 (hereinafter the Order or the Permit), renews NPDES Permit No. CAS618036 that was first issued on October 19, 1990 (Order No. 90-136, first-term permit) and renewed on March 8, 1996 (Order No. 96-32, second-term permit) and October 25, 2002 (Order No. R8-2002-0012, third-term permit). Order No. R8-2010-0036 is the fourth-term permit. The Permit outlines additional steps for an effective, risk-based, storm water management program and specifies requirements to meet applicable water quality standards. This Order requires the Permittees to investigate sources of pollutants in storm water runoff where activities that the Permittees conduct, approve, regulate or authorize through their licensing and permitting processes, have a reasonable potential to exceed water quality standards.

B. **Regulatory Basis/Legal Authorities**

1. This Order is issued pursuant to CWA Section 402(p) (USC §1342(p)) and implementing regulations adopted by the United States Environmental Protection Agency (USEPA) as codified in Code of Federal Regulations, Title 40, Parts 122, 123, and 124 (40 CFR 122, 123 & 124); the Porter Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000); all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Board); the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan); the California Toxics Rule (CTR); and the California Toxics Rule Implementation Plan. The Basin Plan also incorporates all state water quality control plans and policies. This Order also serves as Waste Discharge requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with Section 13260).

2. This Order is consistent with the following precedential Orders adopted by the State Board addressing municipal storm water NPDES permits: Order 99-05-DWQ (Petition of Environmental Health Coalition/Receiving Water Limitation Language for Municipal Storm Water Permits); Order WQ-2000-11 (Petitions of Bellflower, City of Arcadia, Western States Petroleum Association/Review of RWQCB and Its Executive Officer Pursuant to Order 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges within Los Angeles County); Order WQ 2001-15 (In the Matter of the Petitions of Building Industry Association of San Diego County and Western States Petroleum Association); and Order WQO 2002-0014 (Petitions of Aliso Viejo, et al/Order to stay provision F.5.f of the permit and part of last sentence of Finding 26 (permit issued by San Diego Regional Board)).

3. The requirements contained in this Order are deemed necessary to protect water quality standards[6] of the receiving waters and to implement the plans and policies described in Finding 1, above. These plans and policies contain numeric and narrative water quality standards for the waterbodies in this Region. In accordance with Section 402(p)(2)(B)(iii) of the CWA and its implementing regulations (40 CFR Parts 122, 123, & 124), this Order requires the Permittees to develop and implement programs and policies necessary to reduce the discharge of pollutants in Urban Runoff to Waters of the U.S. to the maximum extent practicable (MEP). The legislative history and the preamble to the federal storm water regulations (40 CFR Parts 122, 123 and 124) indicate that Congress and the USEPA were aware of the difficulties in regulating Urban Runoff solely through traditional end-of-pipe treatment. Consistent with the CWA, it is the Regional Board's intent that this Order require the implementation of

[6] Under the Clean Water Act, the beneficial uses and the water quality objectives to protect those beneficial uses are collectively referred to as water quality standards.

best management practices (BMPs)[7] to reduce, consistent with the MEP standard, the discharge of pollutants in urban storm water from the MS4s in order to support attainment of water quality standards.

4. On June 17, 1999, the State Board adopted Water Quality Order No. 99-05. This is a precedential Order that incorporates the receiving water limitations language recommended by USEPA. Consistent with the State Board's order, this Order requires the Permittees to comply with the applicable water quality standards, which is to be achieved through an iterative approach requiring the implementation of BMPs that are designed to meet water quality standards. Most municipal storm water permits issued in California specify certain minimum control measures and incorporate an iterative process that requires increasingly more effective control measures if the water quality standards are not met.

5. This Order is also consistent with the 2006 San Bernardino County Superior Court decision related to storm water permitting that upheld the Regional Board's position regarding the City of Rancho Cucamonga's appeal of the 2002 San Bernardino County MS4 Permit, Order No. R8-2002-0012 (City of Rancho Cucamonga vs. Regional Water Quality Control Board – Santa Ana Region, Fourth Appellate Court, Super. Ct. No. RCV 071613).

6. This Order does not constitute an unfunded mandate subject to subvention under Article XIII.B, Section (6) of the California Constitution for several reasons, including the following:

   a. This Order implements federally mandated requirements under Clean Water Act Section 402(p)(3)(B). (33 USC §1342(p)(3)(B)).
   b. The Permittees' obligation under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges.
   c. The Permittees have the authority to levy service charges, fees, or assessments to pay for compliance with this Order. Certain assessments may require voter approval[8].
   d. The Permittees requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act Section 301, subdivision (a). (33 USC §1311(a)).

[7] Best Management Practices (BMPs) are programs, policies and practices, including structural and engineering controls, to control the discharge of pollutants that are maximized in efficiency. Also see BMP definition under Glossary.

[8] For example, the City of Santa Cruz voted to raise property taxes to fund the storm water program at the November 4, 2008 election (see: http://www.santacruzsentinel.com/localnews/ci_10904561).

C. Rationale for Requirements

1. The Regional Board developed the requirements in this Order based on information submitted as part of the ROWD, the MSWMP, monitoring and reporting data, program audits, and other available information and these requirements are consistent with the federal and state laws and regulations. The Fact Sheet (Attachment 6) contains additional regulatory background information and rationale for requirements in this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments 1 through 9 are also incorporated into this Order.

2. The ROWD included a program effectiveness analysis and recommended a shift in the San Bernardino County MS4 program from programmatic/administrative tasks to compliance based on water quality standards and on tasks identified in the implementation plans for total maximum daily loads (TMDLs). . The MSWMP includes risk-based, outcome-oriented and compliance-focused programs and performance commitments. The MSWMP is a dynamic document that implements programs and policies to control the discharge of pollutants in Urban Runoff consistent with the MEP standard. If the control measures proposed and implemented as per the MSWMP and other requirements included in this Order are not effective in meeting water quality standards, the Permittees are required to revise the MSWMP with more effective control measures.

3. The MSWMP includes the Permittees' performance commitments for each of the major program elements and those performance commitments are incorporated into this Order.

4. Regional Board staff evaluated each of the Permittees' storm water programs and determined that one of the major deficiencies in the programs was a lack of a written procedure on how to implement various elements of the MSWMP. This Order requires each of the Permittees to develop and implement its own Local Implementation Plan (LIP). The LIP should document internal procedures for implementation of the program elements described in the MSWMP.

5. This Order requires the Permittees to revise the MSWMP and associated documents, as needed, to incorporate any applicable requirements in this Order, any applicable TMDLs adopted by the Regional Board and approved by the State Board, Office of Administrative Law and the USEPA, and to incorporate any additional applicable BMPs needed to meet water quality standards. All documents submitted in accordance with this Order for approval by the Executive Officer or the Regional Board

will be publicly noticed prior to approval by the Executive Officer or the Regional Board[9].

D. **California Environmental Quality Act (CEQA)**

1. Under Water Code Section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code Sections 21100 et seq. (*County of Los Angeles v. California State Water Resources Control Board* (2006) 142 Cal.App.4th 985, mod. (Nov 6, 2006, B184034) 50 Cal. Rptr.3d 619, 632-636.) This action also involves the re-issuance of waste discharge requirements for existing MS4s that discharge storm water and urban runoff and as such, is exempt from the provisions of California Environmental Quality Act (commencing with Section 21100) in that the activity is exempt pursuant to Title 14 of the California Code of Regulations Section 15301.

E. **Discharge Characteristics/Risk-Based Storm Water Management**

1. This Order regulates the discharge of pollutants from anthropogenic (generated from human activities, excluding agricultural activities) sources and/or activities in urban and storm water runoff, and certain types of de-minimus discharges specifically authorized under Section V of this Order, from areas under the jurisdiction of the Permittees. The term storm water as used in this Order includes storm water runoff, snowmelt runoff, and surface runoff and drainage. Storm water discharges consist of surface runoff that discharges into Waters of the U.S. The quality of these discharges varies considerably and is affected by land use activities, hydrology and geology, season, the frequency and duration of storm events, and the presence of illicit disposal practices and illegal connections.

2. Studies conducted by the USEPA, the states, counties, cities, flood control districts and other political entities dealing with urban and "storm water" runoff identified the following major sources of urban runoff "pollution" nationwide[10]:

   a. Industrial sites where appropriate pollution prevention and best management practices (BMPs) are not implemented;

[9]The Executive Officer shall provide members of the public with notice and at least a 30-day comment opportunity for all documents submitted in accordance with this Order. If the Executive Officer, after considering timely submitted comments, concludes that the document is adequate or adequate with specified changes, the Executive Officer may approve the document or present it the to Board for its consideration at a regularly scheduled and noticed meeting. If there are significant issues that cannot be resolved by the Executive Officer, the document will be presented to the Board for its consideration at a regularly scheduled meeting.

[10] See Attachment 4-Glossary, for definition of "storm water", and "pollution".

b. Construction sites where erosion and siltation controls and other BMPs are not implemented; and,
c. Runoff from urbanized areas; and
d. Natural background, including leaching of naturally-occurring nutrients and minerals from local soils.

3. A number of permits have been adopted to address pollution from the anthropogenic sources identified in Finding 2, above. The State Board issued three statewide general NPDES permits: one for storm water runoff from industrial activities (NPDES No. CAS000001, General Industrial Activities Storm Water Permit), a second permit for storm water runoff from construction activities (NPDES No. CAS000002, General Construction Activity Storm Water Permit) and a third permit for Storm Water Runoff Associated with Small Linear Underground/Overhead Construction Projects (CAS000005, now incorporated into NPDES No. CAS000002). Industrial activities (as identified in 40 CFR 122.26(b)(14)) and construction sites of one acre or more, are required to obtain coverage under these statewide general permits. The permittees have developed project conditions of approval for projects requiring coverage under the State's General Permits to be effective at the time of grading or building permit issuance for construction sites on one acre or more and at the time of local permit issuance for industrial facilities.

4. The State Board also adopted NPDES No. CAS000003 for storm water runoff from facilities (including freeways and highways) owned and/or operated by California Department of Transportation (Caltrans) and NPDES No. CAS000004, for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems. The Regional Board adopted Order No. R8-2007-0001, NPDES No. CAG018001, for concentrated animal feeding operations, including dairies. The Regional Board also issues individual storm water permits for certain industrial facilities within the Region. Currently there are two facilities located within San Bernardino County (California Steel and Ecology Auto Wrecking[11]) with individual storm water permits. Additionally, for a number of facilities that discharge process wastewater and storm water, storm water discharge requirements are included with the facilities' NPDES permit for process wastewater.

5. In most cases, the industries and construction sites covered under the Statewide General Industrial and Construction Permits discharge into storm drains and/or flood control facilities owned and operated by the Permittees. The Permittees have enacted a system of local ordinances, building permits and business licensing practices to regulate residential, industrial and construction sites within their jurisdiction for the purpose of reducing storm water pollution consistent with the maximum extent practicable standard.

[11] Ecology Auto Wrecking does not discharge storm water into waters of the U.S.

6. The Regional Board administers compliance with the State's General Industrial and Construction Activities Storm Water Permits. A coordinated effort between the Permittees and the Regional Board staff is critical to avoid duplicative effort when overseeing the compliance of dischargers covered under these General Permits. As part of this coordination, the Permittees have been notifying Regional Board staff when, during their routine activities, they observe conditions that pose a potential threat to water quality or when they discover an industrial facility or construction activity that failed to obtain coverage under the applicable general storm water permit.

7. The Permittees have conducted storm water and receiving water monitoring as required under the first, second and third term permits. These monitoring data and data from other sources have confirmed that urban and storm water may contain waste, as defined in CWC § 13050, and pollutants that adversely affect the quality of the Waters of the U.S. The discharge of Urban Runoff from an MS4 is defined in the CWA as a "discharge of pollutants from a point source" into Waters of the U.S.

8. Urban and storm water runoff may contain elevated levels of pathogens (bacteria, protozoa, viruses), sediment, trash, fertilizers (nutrients: nitrogen and phosphorus compounds), pesticides (DDT, chlordane, diazinon, chlorpyrifos, etc.), heavy metals (cadmium, chromium, copper, lead, zinc, etc.), and petroleum products (oil, grease, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, etc.). Storm water can carry these pollutants to rivers, streams, lakes, bays and the ocean (receiving waters).

9. These pollutants can impact the beneficial uses of the receiving waters and can cause or threaten to cause a condition of pollution or nuisance.

10. Pathogens (from sanitary sewer overflows, septic system leaks, spills and leaks from portable toilets, pets, wildlife, and human activities) can impact water contact recreation and non-contact water recreation. Runoff from San Bernardino County areas is tributary to the Santa Ana River which periodically discharges into the Pacific Ocean in Orange County. Although microbial contamination of the beaches from urban runoff and other sources has resulted in beach closures and health advisories in Orange County, discharges from San Bernardino County are typically captured and infiltrated in designated recharge areas downstream of Prado Dam. In the middle Santa Ana River basin areas, the bacterial levels exceed the Basin Plan objectives (see Finding F, below).

11. The Santa Ana River Watershed has been hydraulically separated into the Upper SAR Watershed (upstream from Prado Dam), and the Lower SAR Watershed (downstream from Prado Dam) since the construction of Prado Dam in 1941. The Regional Board regulates discharges from sewage treatment plants upstream of the dam. According to the USGS (2004[12]),

[12] Water Quality in the Santa Ana Basin, California, 1999-2001, Kenneth Belitz, et al, USGS Circular 1238.

water managers utilize almost all of the base flow and most of the stormflow to recharge the coastal aquifer system. Baseflow consists primarily of treated wastewater. Baseflows from the dam are managed, in coordination with the US Army Corps of Engineers, to be captured and infiltrated downstream from the dam; stormflows occasionally exceed the infiltration capacity (OCWD 2009[13]). Water quality in flows from the dam have been monitored for over 40 years and generally found to meet water quality standards specified in the Basin Plan. The dam and the wetlands help to reduce pollutant transport from the upper watershed to the lower watershed. The impoundment area also reduces the transport of trash and debris. As such, water quality management in the upper watershed is targeted to primarily address problems upstream from Prado Dam. Addressing pollutants of concern above Prado Dam will also improve water quality downstream. Augmentation of groundwater through infiltration of baseflow and stormflow is also actively managed in the upper watershed area (e.g. 2006 Chino Creek Integrated Plan: Guidance for Working Together to Protect, Improve, and Enhance the Lower Chino Creek Watershed).

12. Oil and grease from spills can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation. Other petroleum hydrocarbon components may cause toxicity to aquatic organisms and may impact human health.

13. Suspended and settleable solids (from construction sites, other sediment sources, trash, and industrial activities) may be deleterious to benthic organisms and may cause anaerobic conditions to form. Sediments and other suspended particulates can cause turbidity, clog fish gills and interfere with respiration in aquatic fauna. They may also screen out light, hindering photosynthesis and normal aquatic plant growth and development.

14. If released into the environment, toxic substances (including pesticides, petroleum products, metals, and industrial wastes) can cause acute and/or chronic toxicity, and can bioaccumulate in organisms to levels that may be harmful to human health.

15. Excessive levels of nutrients (from fertilizer use, fire fighting chemicals, decaying plants, confined animal facilities, pets, and wildlife) can cause excessive algal blooms. These blooms may lead to problems with taste, odor, color and increased turbidity, and may depress the dissolved oxygen content, leading to fish kills.

16. Trash and debris, in particular plastics, are aesthetic nuisances and as threats to freshwater and marine environments. Plastic debris harms hundreds of wildlife species through ingestion, entanglements and

[13] Orange County Water District: Groundwater Management Plan, 2009 Update. July 9, 2009, pp. 4-4

entrapment. Plastic nurdles[14] have the capability of absorbing pollutants, such as PCBs, and when ingested by wildlife, expose those animals to pollutant concentrations that are orders of magnitude higher than the surrounding water. Water Code Section 13367 requires the State Board and the regional boards to implement a program to control discharges of pre-production plastic from point and nonpoint sources. "Floatables" (from trash and debris) are an aesthetic nuisance and can be a substrate for algae and insect vectors. This Order requires the Permittees to control the discharge of trash and debris, including plastic nurdles, from the MS4s to Waters of the U.S.

17. Management of dry weather discharges resulting from urbanization provides an opportunity to promote water conservation as well as address water quality. This Order requires the Permittees to promote and implement best management practices for water conservation, and thereby, minimize non-stormwater flows into and from the MS4s.

18. In order to characterize storm water discharges, to identify problem areas, to determine the impact of urban runoff on receiving waters, and to determine the effectiveness of the various BMPs, an effective monitoring program is critical. The Principal Permittee administers the monitoring program for the Permittees. This program includes storm drain outfall monitoring, receiving water monitoring, and dry weather monitoring. The ROWD compared the monitoring results to: (a) water quality objectives in the Basin Plan; (b) CTR objectives; and (c) USEPA storm water benchmarks contained in the USEPA Multi-Sector Industrial Storm Water Permit. In order to ascertain overall water quality conditions in the permitted area, the Permittees also evaluated monitoring data from other sources such as: (a) National Water Quality Assessment conducted by the USGS[15] (NAWQA); and (b) Santa Ana Regional Water Quality Board's Water Quality Assessment per Section 305(b) of the CWA (RWQCB 305(b) Assessment).

19. The Permittees' water quality monitoring data submitted to date document a number of exceedances of water quality objectives specified in the Basin Plan, CTR criteria and/or USEPA's storm water bench mark for fecal coliform bacteria, total suspended solids, nutrients, COD and metals These findings indicate that urban and storm water runoff is causing or contributing to water quality impairments.

20. Comparison of wet weather water quality monitoring data for 2000-2006[16] with that from 1994-1999[17] shows that the median concentrations for most

[14] Nurdles: pre-production plastic pellets or plastic resin pellets
[15] Belitz, K., Hamlin, S.N.,Burton, C.A., Kent, R., Fay, R.G., and Johnson, T., 2004. *Water Quality in the Santa Ana Basin, California,* 1999-2001.Circular 1238. U. S. Geological Survey. (This is only one of several USGS reports.)
[16] 2006 ROWD
[17] 2002 ROWD

constituents have not changed significantly. Furthermore, monitoring data for the period 1994-2006 indicate that median concentrations of wet weather composite samples at monitoring stations[18] 2, 3, and 8 exceeded the USEPA benchmarks for TSS, COD, NO_3-N, and metals. With the exception of Site 10 (Santa Ana River upstream of Seven Oaks Dam, with drainage from mostly undeveloped areas), coliform bacteria concentrations were far above the Basin Plan water quality objectives. These data support the need for continued monitoring and additional control measures to control the discharge of pollutants from the MS4s.

21. A limited number of constituents were monitored during dry weather at representative urban runoff locations and some of these constituents also exceeded the Basin Plan objectives. These findings indicate that additional surveillance and controls may be needed to minimize and/or eliminate dry weather flows into and from the MS4s.

22. The Principal Permittee conducted an analysis of the receiving water monitoring data collected during the last 15 years for a number of monitoring sites (Sites 2, 3, 8[19], and 10[20]). This analysis indicates that the most significant water quality problem associated with urban and storm water runoff is bacterial contamination. It also showed that Basin Plan objectives for metals such as lead, copper, and zinc[21] are exceeded more frequently than Federal promulgated standards. The Permittees monitoring data were then compared to monitoring data available from other sources (NAWQA, RWQCB 305(b) Assessment) to determine beneficial use impacts and pollutants causing the impacts. This analysis was then used to prioritize problem areas and to propose a risk-based approach to address these problems.

23. Based on the evaluation of monitoring data described above, the ROWD prioritized the pollutants of concern with regards to storm water management as follow:

    a. High Priority: Coliform bacteria
    b. Medium Priority: Zinc, copper, lead
    c. Low Priority: Nutrients, COD, TSS

[18] Drainage at Site 2 (Cucamonga Creek @ Hwy 60) is predominantly urban, influenced by commercial and industrial land uses with some contribution from open space/rural and residential land uses. The predominant land use at Site 3 (Cucamonga Creek @ Hellman) is agricultural, but there is contribution from open space/rural, and discharge from a municipal wastewater treatment plant between Sites 2 and 3. Monitoring site 5 (Hunts Lane n/o Hospitality Lane) is within a constructed storm drain system and flow is mostly from commercial and light industrial land uses with some urban contribution.

[19] Site 8 station is located in the Santa Ana River (SAR) at Hamner Avenue, runoff is mostly from urban land uses.

[20] Site 10 station is located at SAR, upstream of Seven Oaks Dam; runoff is mostly from open/rural areas.

[21] There is no Basin Plan objective for zinc, USEPA benchmark is 0.117 mg/l.

F. CWA Section 303(d) Listed Waterbodies and TMDLS (Also see Section L)

1. Considerable sampling data have been collected to characterize ambient receiving water quality in the Region. Water quality assessments conducted by the Regional Board have identified a number of beneficial use impairments, due in part, to urban runoff. Section 305(b) of the CWA requires each of the regional boards to routinely monitor and assess the quality of waters of its region. If this assessment indicates that beneficial uses are not met, then that waterbody must be listed under Section 303(d) of the CWA as an impaired waterbody.
2. The Regional Board's 2006 water quality assessment listed a number of water bodies within the permitted area under Section 303(d) as impaired water bodies (see Table 3)[22].
3. Federal regulations require that a total maximum daily load (TMDL) be established for each 303(d) listed waterbody for each of the pollutants causing impairment. The TMDL is the maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. A TMDL is the sum of the individual wasteload allocations (WLA) for point source inputs, load allocations (LA) for non-point source inputs and natural background, with a margin of safety. The TMDLs are one of the bases for limitations established in waste discharge requirements.
4. For 303(d) listed waterbodies without a TMDL, the Permittees are required to participate in the development and implementation of TMDLs and Watershed Action Plans. If a TMDL has been developed and an implementation plan is yet to be developed (e.g., when the USEPA has established the TMDL), the Permittees are required to develop constituent specific source control measures, conduct additional monitoring and/or cooperate with the development of an implementation plan.

Table 3. CWA Section 303(d) List of Water Quality Limited Segments, Santa Ana Region {Waterbodies Requiring a TMDL in San Bernardino County[1]}

Water Body Name	Pollutant / Stressor	Potential Sources	Proposed TMDL Completion
Big Bear Lake	Copper[2]	Resource extraction	2007
	Mercury	Resource extraction[5]	2007
	Metals	Resource extraction	2007

[22] On April 24, 2009, the Regional Board adopted Resolution No. R8-2009-0032 approving the 2008 Integrated Report of Federal Clean Water Act Section 305(b) and Section 303(d) List of Water Quality Limited Segments. Minor additional modifications were approved by the Regional Board on October 23, 2009. When the revised list is approved by the State Board and the USEPA, the 2006 list will be updated.

	Noxious aquatic plants	Construction/Land development, Unknown point source	2006
	Nutrients	Construction/Land development, Snow skiing activities	2006
	PCBs (Polychlorinated biphenyls)	Source unknown	2019
	Sedimentation/Siltation[3]	Construction/Land development, Snow skiing activities, Unknown nonpoint source	2006
Summit Creek	Nutrients	Construction/Land development	2008
Knickerbocker Creek	Pathogens[4]	Unknown nonpoint source	2005
	Metals	Unknown nonpoint source	2007
Grout Creek	Metals	Unknown nonpoint source	2007
	Nutrients	Unknown nonpoint source	2008
Rathbone (Rathbun) Creek	Sedimentation/Siltation	Unknown nonpoint source Snow skiing activities	2006
	Nutrients	Unknown nonpoint source Snow skiing activities	2008
Mountain Home Creek	Pathogens	Unknown nonpoint source	2019
Mountain Home Creek, East Fork	Pathogens	Unknown nonpoint source	2019
Lytle Creek	Pathogens	Unknown nonpoint source	2019
Mill Creek (Prado Area)	Nutrients	Agriculture, Dairies	2019
	Total Suspended Solids (TSS)	Dairies	2019
Prado Park Lake	Nutrients	Nonpoint source	2019
Chino Creek Reach 1	Nutrients	Agriculture, Dairies	2019
Mill Creek Reach 1	Pathogens	Unknown nonpoint source	2019
Mill Creek Reach 2	Pathogens	Unknown nonpoint source	2019
Santa Ana River, Reach 4	Pathogens	Nonpoint source	2019

[1] Based on STATE BOARD 2006 CWA Section 303(d) List of Water Quality Limited Segments, Santa Ana Regional Water Quality Control Board, USEPA Approved June 28, 2007 (http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r8_06_303d_reqtmdls.pdf)

[2] Big Bear Lake is recommended for delisting for copper in the Proposed 2008 303(d)-305(b) Integrated Report

[3] Big Bear Lake is recommended for delisting for sedimentation/siltation in the Proposed 2008 303(d)-305(b) Integrated Report

[4] (See Section 6, below).

[5] Resource extraction was removed as a potential source for Mercury in Big Bear Lake and replaced with atmospheric deposition in the Proposed 2008 303(d)-305(b) Integrated Report

5. Big Bear Lake is included under the 2006 CWA Section 303(d) list for mercury. Historical and recent monitoring conducted by Regional Board staff and other entities confirm that the Office of Environmental Health

Hazard Assessment's (OEHHA) mercury fish tissue screening level of 0.3 mg/kg has been exceeded. This finding is likely to impact REC1 (fishing) uses of Big Bear Lake. Recent monitoring efforts and technical support documents (Tetra Tech, 2008)[23] to determine the source of mercury and to develop TMDLs indicate that though majority of the watershed load originates from atmospheric deposition, delivery is dependent on runoff and sediment transport to the lake. However, there is insufficient data to draw conclusions about the effect of urbanization on mercury input to the Lake.

a. It has been demonstrated that mercury loadings are proportional to fine sediment loads and sediment loads are directly proportional to increases in flow rates.

b. Urbanization generally increases impermeable surfaces and that results in increased flow rates which in turn could increase mercury loadings to Big Bear Lake.

c. The Big Bear Lake Mercury TMDL is expected to be completed and approved within this permit cycle. This Order may be reopened to include any additional requirements from the Mercury TMDL Implementation Plan.

d. Pending adoption of the Big Bear Lake Mercury TMDL, this Order requires the stakeholders to participate in the implementation of control measures to minimize the impact of urbanization on water quality.

6. **Knickerbocker Creek Sole Source Pathogen Investigation and Control:**

a. Knickerbocker Creek is one of Big Bear Lake's tributaries. It is engineered and constructed of concrete through the Big Bear Village area to carry flows from 100-year frequency flood event, but is a natural channel within the upper boundaries of the City and the Forest Service area. The Creek is an ephemeral stream that flows largely in response to storm events or during the spring when runoff is comprised largely of snowmelt.

b. The Basin Plan designates municipal and domestic water supply (MUN), water contact recreation (REC1) and non-contact water recreation (REC2) as beneficial uses of Knickerbocker Creek.

c. To protect MUN beneficial use, the Basin Plan specifies a numeric water quality objective for total coliform of less than 100 organisms/100 mL. To protect REC1 beneficial use, the Basin Plan specifies numeric water quality objectives for fecal coliform indicator bacteria of log mean less than 200 organisms/100 mL based on five or more samples/30

[23] Big Bear Lake Technical Support Document for Mercury TMDL,, September 2008, Prepared by Tetratech for U.S EPA Region 9 and Santa Ana Regional Water Quality Board

day period and not more than 10% of the samples shall exceed 400 organisms/100 ml for any 30-day period.

d. In 1994, Regional Board issued a report titled "The Investigation of Toxics and Nutrients in Big Bear Lake" which included test results for Big Bear Lake and many of its tributaries for bacterial indicators.

e. The test results indicated that Knickerbocker Creek had bacteria indicator levels that exceeded the MUN and REC1 Basin Plan objectives for total coliform and fecal coliform. In 1994, Knickerbocker Creek was placed on the Clean Water Act Section 303(d) List as impaired for pathogens.

f. As a result of the 303(d) listing, the Regional Board needed to develop a regulatory strategy to address the elevated bacterial levels. Typically, this is the development and implementation of TMDLs.

g. In 2000, Regional Board staff initiated development of TMDLs in the Big Bear Lake watershed, including the Knickerbocker Creek bacteria indicator TMDL. A sampling program was conducted from June 2002 through April 2003, on five sites along the Creek, to identify potential sources of elevated bacteria levels, if any.

h. The results of the sampling program indicated that at times, bacterial indicators exceeded the Basin Plan objectives for total and fecal coliform objectives at the sampling sites located within city boundaries. However, data from the station representing drainage from the forested area indicated that bacterial indicator concentrations complied with the Basin Plan objectives.

i. The monitoring results indicated that although bacteria were also detected outside of city boundaries, the concentrations were not high enough to cause water quality objectives to be exceeded in Knickerbocker Creek.

j. The sampling program identified the runoff from the City as a sole source of bacteria contamination in Knickerbocker Creek. Regional Board staff determined that the bacteria sources in Knickerbocker Creek could be addressed through the MS4 permit without developing a detailed TMDL.

k. Since most of the inlets to Knickerbocker Creek are from a conduit or other channelized systems from the City, the City was required to address this bacterial problem.

l. Pursuant to Provision IV, Receiving Water Limitations, Order No. R8-2002-0012 (third-term permit), the Executive Officer directed the City of Big Bear Lake to submit by September 30, 2005: (i) a plan and a schedule for identification and investigation of the sources of bacteria; (ii) a list of the BMPs that are currently being implemented and additional BMPs that must be implemented to address the exceedance

of bacteria in Knickerbocker Creek; (iii) a plan and a schedule for implementation of additional control measures (including BMPs) to reduce or eliminate the exceedances; and (iv) a plan and a schedule for implementation of a monitoring program to evaluate the efficacy of any control measures implemented[24].

m. In compliance with the above, the City of Big Bear Lake submitted a plan and a schedule and conducted a source identification study and Phase 1 of the water quality monitoring program in 2006. The City investigated the entire sewer and septic systems located near Knickerbocker Creek and found no sanitary sewer leaks or septic system problems in the area.

n. Molecular DNA analysis confirmed that the bacteria contamination was not from human sources, but more likely from canine sources (domestic dogs).

o. In December 2007, the City purchased and installed several pet waste stations in the Knickerbocker Creek catchment areas, and installed portable toilets near parks and other recreation areas to reduce the potential for bacteria contamination in the Creek. The City believes that these control measures should address the bacteria problems in the Creek.

p. The City is currently implementing Phase 2 of the water quality monitoring program[25] to assess the effectiveness of these control measures. Three sampling locations in the Creek within City boundaries were selected based on increased frequency of high bacteria levels and availability of sustained flows.

q. This Order requires the City to continue monitoring and assessment of the effectiveness of its control measures and to submit an annual progress/status report.

7. Within the permitted area, there are six fully approved TMDLS: (a) five Middle Santa Ana River Bacterial Indicator TMDLs (MSAR TMDL); and (b) one Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions. The Basin Plan amendment incorporating the MSAR TMDLs was approved by the Regional Board on August 26, 2005 (Resolution No. R8-2005-0001), by the State Board on May 15, 2006, by the state's Office of Administrative Law on September 1, 2006, and by the USEPA on May 16, 2007.

[24]Santa Ana Regional Water Quality Control Board, Letter from Gerard J. Thibeault, July 31, 2005, "Determination of Water Quality Standards Exceedance in Knickerbocker Creek Being Caused by MS4 Discharges in the City of Big Bear Lake".

[25]City of Big Bear Lake, January 2008, "Bacteria Monitoring Plan for Knickerbocker Creek Phase 2.

8. The MSAR TMDLs established limits for bacterial source indicators for Santa Ana River (Reach 3) (not in San Bernardino County), Chino Creek (Reaches 1 and 2), Prado Park Lake, Mill Creek (Prado Area), and Cucamonga Creek (Reach 1).

9. The purpose of the MSAR TMDL is to assure that REC1 beneficial uses are protected. To that end, the Regional Board adopted wasteload allocations for fecal coliform and *E. coli* in the above impaired waterbodies. There are two components in the MSAR TMDL (fecal coliform and *E. coli*). The Basin Plan currently does not have an established objective for *E. coli*. Stakeholders in the Santa Ana Region have formed the Storm Water Quality Standards Task Force (SWQSTF) to evaluate USEPA's bacterial indicator recommendations and appropriate recreational beneficial use designations for waterbodies throughout the Region. The SWQSTF is expected to make recommendations for the adoption of alternative bacterial indicators such as *E.coli,* based on USEPA's "Ambient Water Quality Criteria for Bacteria - 1986". These and other recommendations of the SWQSTF are likely to result in changes to recreational water quality objectives. When and if the Basin Plan is amended to incorporate new beneficial use definitions, designations and/or bacterial standards, the MSAR TMDLs will be revised, as appropriate.

10. The MS4 dischargers are required to develop and implement BMPs designed to reduce bacterial pollution to the maximum extent practicable and to evaluate the effectiveness of those efforts towards attainment of WLAs by the compliance dates. The TMDL implementation plan envisioned short-term solutions, including monitoring, and development of a long-term plan designed to achieve compliance by the deadlines specified in the TMDL.

11. The MSAR TMDL Implementation Plan assigns responsibilities to MS4 dischargers and other stakeholders. These responsibilities include monitoring and evaluating compliance, identifying sources of impairment, and evaluating the effectiveness of BMPs and other control actions. The MSAR TMDL implementation plan assigns responsibilities for urban discharges to specific MS4 dischargers to identify sources of impairment, to propose BMPs to address those sources, and to monitor, evaluate, and revise BMPs as needed, based on the effectiveness of the BMP implementation program. These are generally considered as the short-term solutions. Specific implementation plan tasks are described in Chapter 5 of the Basin Plan and are assigned to one or more of the Permittees. Requirements of the TMDL implementation plan tasks are incorporated into this Order. A number of these implementation plan tasks are also jointly assigned to non-Permittee stakeholders. The stakeholders have established TMDL task forces to jointly implement and coordinate the TMDL implementation plan tasks.

12. The MSAR TMDL Task Force members are listed in Table 4:

Table 4. Middle Santa Ana River Bacterial Indicator TMDL Task Force

MS4 Permittees	Non-MS4 Permittees
San Bernardino County Flood Control District (as Principal Permittee and on behalf of the Co-Permittees named in the TMDL)	Santa Ana Watershed Project Authority (SAWPA)
Corona, City of (Riverside County MS4 Permittee)	
Norco, City of (Riverside County MS4 Permittee)	US Department of Agriculture-Forest Service
Riverside, City of (Riverside County MS4 Permittee)	Milk Producers Council
Riverside, County of (Riverside County MS4 Permittee)	Chino Basin Watermaster Agricultural Pool
Riverside County Flood Control and Water Conservation District (Riverside County MS4 Principal Permittee)	Region 4 MS4 Permittees: Cities of Claremont and Pomona (pending formal agreement)

13. Requirements in the MSAR TMDLs include the following:

a. WLAs for urban discharges and for CAFOs (Concentrated Animal Feeding Operations), and LAs for agriculture and natural sources (open space and undeveloped forest land) during wet and dry weather conditions.

b. Numeric targets for fecal coliform and *E. coli*.

c. Specific implementation tasks to ensure compliance with the numeric targets, WLAs and LAs. Some of these tasks have been completed.

i. Pursuant to Task 3, the MSAR TMDL Task Force submitted a monitoring plan which was approved by the Regional Board on June 29, 2007 (Resolution No. R8-2007-0046). A revised monitoring plan that included a BMP effectiveness study was approved by the Regional Board on April 18, 2008 (Resolution No. R8-2008-0044).

ii. A BMP effectiveness study was completed as part of the watershed-wide BMP effectiveness component of the Middle Santa Ana River Water Quality Monitoring Plan (dated April 3, 2008). The results of this study will be incorporated into BMP selection criteria that will be utilized as a guide to address bacterial indicator sources within the MSAR watershed. The Riverside County Flood Control District plans to conduct a phase 2 study at its LID testing facility to evaluate the effectiveness of several LID-based BMPs, which will further guide BMP selection in the watershed.

iii. Pursuant to Task 4.1, the MSAR TMDL Task Force submitted an Urban Bacterial Indicator Source Evaluation Plan (USEP) that was approved by the Regional Board on April 18, 2008 (Resolution No. R8-2008-0044). The USEP is a phased approach. The first phase

of the approved USEP has been completed and a report is currently under review by Regional Board staff. Several discrete sources of bacterial indicator were identified, controlled or eliminated as a result of this effort. Based on the outfall monitoring data collected to date, additional sites are identified, monitored and prioritized yearly for further evaluation. The next phase of the USEP will focus on BMP retrofit implementation to address elevated indicator bacteria from urban drainage areas flowing into Mill Creek and Cucamonga Creek.

iv. Consistent with Task 4.2, this Order requires the Permittees to revise the MSWMP to incorporate the results of the USEP and/or other studies. The MSWMP revisions shall include schedules for meeting the bacterial indicator wasteload allocations based on the schedule established in the MSAR TMDLs and the results of the USEP and/or other studies.

v. Pursuant to Task 4.4, the Permittees are required to revise the Water Quality Management Plan to incorporate BMPs as per the USEP, Task 4.1, for new development and significant redevelopment projects.

vi. Based on the results of pre-compliance evaluation monitoring[26], it has been determined that the short-term solutions discussed above are not expected to achieve the WLAs by the compliance dates. This Order requires the MSAR Permittees to develop a long-term plan (a comprehensive bacteria reduction plan, CBRP) designed to achieve compliance with the WLAs by the compliance dates.

vii. If necessary, the CBRP will be updated based on an evaluation of the effectiveness of the BMPs implemented. In the absence of an approved CBRP the WLAs become the final numeric water quality-based effluent limit that must be achieved by the compliance dates.

14. On April 21, 2006, the Regional Board adopted the Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions (Resolution R8-2006-0023); the State Board approved the Basin Plan Amendment on April 3, 2007 and the Office of Administrative Law approved the Basin Plan Amendment on August 21, 2007. USEPA approved the TMDL on September 25, 2007. There were insufficient watershed and in-lake nutrient data to support development of TMDLs, load allocations, and wasteload allocations for average and/or wet hydrologic conditions; therefore the TMDL is specific to dry hydrological conditions. This Order requires the Permittees to implement the tasks identified in the implementation plan for the Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions (Big Bear Lake Nutrient TMDL).

[26] Pre-compliance evaluation monitoring is monitoring conducted prior to the TMDL compliance date to assess the effectiveness of BMPs implemented in reducing pollutant(s) of concern by the compliance date.

15. Some of the details of the implementation plan for the Bear Lake Nutrient TMDL are described below.

    a. The Big Bear Lake Nutrient TMDL includes an urban WLA for total phosphorus for dry hydrologic conditions. Phosphorus is the primary limiting nutrient in Big Bear Lake and nitrogen can be a limiting nutrient under certain conditions.

    b. Nutrient discharges to the Lake have promoted the proliferation of nuisance aquatic plants which have impacted the Lake's beneficial uses and dissolved oxygen levels.

    c. The Big Bear Lake Nutrient TMDL specifies response targets for chlorophyll a, macrophyte coverage and percentage of nuisance aquatic vascular plant species for Big Bear Lake. These response-targets provide a method to track improvements in water quality resulting from reductions in phosphorus loading.

    d. Whereas the Big Bear Lake Nutrient TMDL is applicable only to dry hydrologic conditions, the numeric targets specified in the TMDL apply to all hydrological conditions. The TMDL specifies that these targets be achieved no later than 2015 for dry hydrological conditions and no later than 2020 for all other hydrological conditions. The Regional Board will judge BMP effectiveness primarily on the basis of how well the MS4s adaptive management program does at meeting these targets for the controllable sources within their jurisdiction.

    e. The urban wasteload allocations are currently being met. This Order requires the County of San Bernardino, San Bernardino County Flood Control District and the City of Big Bear Lake (the Big Bear Lake MS4 Permittees) to continue to monitor and to develop and implement additional BMPs, if necessary.

    f. The Big Bear Lake MS4 Permittees also participate in a stakeholder effort to achieve the following Big Bear Lake Nutrient TMDL numeric targets:

Table 5. Big Bear Lake Nutrient TMDL Numeric Targets

Indicator	Target Value[a]
Total P concentration	Annual average[b] no greater than 35 µg/L; to be attained no later than 2015 (dry hydrological conditions), 2020 (all other times)[c]
Macrophyte Coverage	30-40% on a total lake area basis; To be attained by 2015 (dry hydrological conditions), 2020 (all other times)[c,d]
Percentage of Nuisance Aquatic Vascular Plant Species	95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species; to be attained no later than 2015 (dry hydrological conditions), 2020 (all other times) [c,d]
Chlorophyll a concentration	Growing season[e] average no greater than 14 µg/L; to be attained no later than 2015 (dry hydrological conditions), 2020 (all other times)[c]

a Compliance with the in-lake targets to be achieved as soon as possible, but no later than the dates specified

b Annual average determined by the following methodology: the nutrient data from both the photic composite and discrete bottom samples are averaged by station number and month; a calendar year average is obtained for each sampling location by averaging the average of each month; and finally, the separate annual averages for each location are averaged to determine the lake-wide average. The in-lake open-water sampling locations used to determine the annual average are MWDL1, MWDL2, MWDL6, and MWDL9 (see 1.B.4. Implementation Task 4.2, Table 5-9a-i).

c Compliance date for wet and/or average hydrological conditions may change in response to approved TMDLs for wet/average hydrological conditions.

d Calculated as a 5-yr running average based on measurements taken at peak macrophyte growth as determined in the Aquatic Plant Management Plan (see 1.B.4. Implementation, Task 6C)

e Growing season is the period from May 1 through October 31 of each year. The open-water sampling locations used to determine the growing season average are MWDL1, MWDL2, MWDL6, MWDL9 (see 1.B.4. Implementation Task 4.2, Table 5-9a-i). The chlorophyll a data from the photic samples are average by station number and month; a growing season average is obtained for each sampling location by averaging the average of each month; and finally, the separate growing season averages for each location are averaged to determine the lake-wide average.

g. Continued compliance with the WLA will be determined by watershed modeling conducted and reported by the Big Bear Lake MS4 Permittees. By March 31, 2010, the Big Bear Lake MS4 Permittees will submit a final watershed modeling plan that is ready to be implemented and that details how compliance with the WLA will be determined and evaluated. This plan is to be implemented upon approval by the Executive Officer.

h. Where effectiveness assessments indicate WLAs are not being achieved, Big Bear Lake MS4 Permittees must develop and implement additional BMPs or demonstrate that no additional practicable BMPs are available. Compliance with the WLAs is to be achieved through the Permittees' implementation of

BMPs in accordance with the TMDL Implementation Plans or as identified as a result of TMDL special studies approved by the Regional Board.

i. The Big Bear Lake Nutrient TMDL Implementation Plan requires the collection and evaluation of nitrogen data to determine compliance with the existing total inorganic nitrogen (TIN) objective for Big Bear Lake.

j. The Big Bear Lake Nutrient TMDL does not specify nutrient reductions from external watershed sources, which include urban discharges (WLAs), resorts and open space/forested lands (LAs). Instead, the TMDL for Dry Hydrological Conditions specifies a reduction in phosphorus from internal nutrient sources, which are lake sediment and macrophytes. External load dischargers are responsible for reducing their contributions to the internal nutrient loads.

k. On December 6, 2006, the City of Big Bear Lake and Snow Summit, Inc., signed a Memorandum of Understanding (MOU) regarding Snow Summit's storm water discharges into the City's MS4 system. The City of Big Bear Lake and Snow Summit agreed that the City has the authority to regulate storm water discharges from properties, including Snow Summit's facilities; to the extent such storm water discharges enter lands within the boundaries of the City, any waters within the jurisdiction of the City, or the City's MS4 facilities. This provides the City an additional tool to control nutrient discharges to the Lake. Responsible agencies and dischargers in the Big Bear Lake watershed have formed a Big Bear Lake TMDL Task Force. The Big Bear TMDL Task Force members are working jointly to implement requirements of the Big Bear Lake Nutrient TMDL.

l. On May 4, 2009, the Big Bear Lake TMDL Task Force submitted a revised watershed-wide monitoring plan. At the May 22, 2009 board meeting, the Regional Board approved the Big Bear Lake Watershed-wide Nutrient Monitoring Plan by adopting Resolution No. R8-2009-0043. This includes a watershed-wide monitoring plan. The Big Bear Lake In-lake Monitoring Plan was adopted on July 18, 2008 (Resolution No. R8-2008-0070). The monitoring program is designed to determine the sources of phosphorus; support the development of TMDLs applicable to other hydrologic conditions; and evaluate progress towards meeting (by the specified compliance dates) the numeric targets specified in the TMDLs.

m. The Big Bear Lake Nutrient TMDL Task Force has also submitted a lake management plan that is currently being revised based on Regional Board staff comments.

n. Based on a weight of evidence evaluation, if the numeric targets for the Lake are met through in-lake controls or other techniques, this would constitute compliance with the requirements of the TMDL implementation plan.

16. As indicated in Table 3 above, bacteria, metals and nutrients are the pollutants of concern for a majority of the waterbodies within the permitted area. One of the major sources of bacteria and nutrients is concentrated animal feeding

operations. Dairy facilities within the region are regulated under the Regional Board's Concentrated Animal Feeding Operations (CAFO) Permit. The Regional Board enforces the CAFO Permit. The Permittees are required to identify and control urban sources of bacteria, nutrients and other pollutants within their jurisdictions, consistent with the MEP standard.

G. **New Development/Significant Redevelopment – WQMP/LID**

1. Significant numbers of development projects have taken place in San Bernardino County in the last decade. These developments have increased the area of the urbanized portion of the watershed. As development occurs, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops and parking lots. Natural vegetated soil can both absorb rainwater and remove pollutants providing an effective natural purification process. In contrast, impervious surfaces (e.g., concrete surface) can neither absorb water nor remove pollutants, and the natural purification characteristics are lost. Urbanization generally increases storm water runoff, volume, and flow velocity. Additionally, conventional urban development significantly increases pollutant loads as the increased population density causes proportionately higher levels of vehicle emissions, vehicle maintenance wastes, municipal sewage wastes, pesticides, household hazardous wastes, lawn fertilizers, pet wastes, trash, and other anthropogenic pollutants.

2. Impacts from urbanization can especially threatens environmentally sensitive riparian areas as well as stream habitat and structure. Such areas may be much more susceptible to degradation from increased pollutant loads. Therefore, development that would otherwise have minimal impact on the environment may adversely impact a sensitive environment. These State-designated environmentally sensitive areas (ESAs) include those areas designated in the Basin Plan as supporting the following beneficial uses: (1) "Rare, Threatened, or Endangered Species (RARE)"; and (2) "Preservation of Biological Habitats of Special Significance (BIOL)".

3. Increased volumes and velocities of storm water discharges from MS4s into natural watercourses can cause stream bank erosion and physical modifications that adversely impact aquatic ecosystems and stream habitat. The collective changes in the hydrologic regime caused by development is termed hydromodification. For the permitted area, the remaining natural streams in the mountains and in lightly urbanized or undeveloped portions of the watershed are most likely to experience adverse impacts from any new development or significant redevelopment projects that are built.

4. On October 5, 2000, the State Board adopted Order No. WQ-2000-11, which required that urban runoff generated by 85th percentile storm events from specific types of development categories (priority projects) be infiltrated, filtered or treated. The essential elements of this precedential Order were incorporated into the third-term permit. The Permittees developed a model Water Quality

Management Plan (WQMP) Guidance and Template and are currently implementing the essential elements of the approved model WQMP.

5. Recent studies have indicated that low impact development[27] LID is an effective storm water management approach that minimizes adverse impacts on storm water runoff quality and quantity resulting from urban developments. The Southern California Monitoring Coalition (SMC), including the project lead agency (the San Bernardino County Flood Control District), in collaboration with SMC member Southern California Coastal Water Research Project (SCCWRP) and the California Storm Water Quality Association (CASQA), with funding from the State Water Resources Control Board and CASQA is developing a Low Impact Development Manual for Southern California. This manual will be incorporated into the CASQA BMP Handbooks. The Permittees will incorporate, where feasible and practicable, the LID process outlined in this manual into a revised version of the WQMP.

6. This Order requires project proponents to first consider preventative and conservation techniques (e.g., preserve and protect natural features to the maximum extent practicable) prior to considering mitigative techniques (structural treatment, such as infiltration systems). The mitigative measures should be prioritized with the highest priority for BMPs that remove storm water pollutants and reduce runoff volume, such as infiltration, then other BMPs, such as harvesting and use, evapotranspiration and bio-treatment[28] should be considered. To the maximum extent practicable, these LID BMPs must be implemented at the project site. The Regional Board recognizes that site conditions, including site soils, contaminant plumes, high groundwater levels, etc., could limit the applicability of infiltration and other LID BMPs at certain project sites. Where LID BMPs are not feasible at the project site, more traditional[29], but equally effective control measures should be implemented. This Order provides for alternatives and in-lieu programs where the preferred LID BMPs are infeasible.

7. The USEPA has determined that LID can be a cost-effective and environmentally preferable approach for the control of storm water pollution and to minimize downstream impacts by mimicking pre-development hydrology and minimizing changes in site hydrology. LID techniques promote the reduction of impervious areas which may achieve multiple environmental and economic benefits in addition to enhanced water quality and supply, stream and habitat protection,

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[27] LID: a set of technologically feasible and cost-effective approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of infiltration, evapotranspiration, and use of rainwater, LID techniques manage water and water pollutants at the source. LID and Green Infrastructure are sometimes used interchangeably. See also Attachment 4-Glossary, for definition of LID.

[28] In general, these types of BMPs utilize vegetation that promote pollutant uptake and evapotranspiration and/or natural or soil type media filtration with volume retention capacity and ability to reduce pollutant concentration.

[29] Typical engineered and/or proprietary treatment devices that capture/filter pollutants but do not contribute to maintenance of pre-development site hydrology. Examples are vortex separators, catch basin filters.

cleaner air, reduced urban temperature, increased energy efficiency and other community benefits such as aesthetics recreation, and wildlife areas. This Order incorporates a volume capture metric based on the use of preferred LID BMPs.

8. It is recognized that LID principles are universal concepts, however, their applicability is dependent on site-specific factors such as: soil conditions including soil compaction and permeability, groundwater levels, soil contaminants (brown field development), space restrictions (in-fill projects, redevelopment projects, high density development, transit-oriented developments), etc. In the event that LID BMPs techniques, particularly infiltration, evapotranspiration, capture-use, and/or biotreatment, are not feasible at a site, alternatives and in-lieu programs are included that will address water quality/quantity concerns.

9. The model WQMP Guidance and Template provide a framework to incorporate some of the watershed protection principles into the Permittees' planning, construction and post-construction phases of priority projects. The model WQMP requires site design (including, where feasible, LID principles), source control and treatment control elements to reduce the discharge of pollutants in urban runoff. On April 30, 2004, the Regional Board approved the model WQMP Guidance and Template. The Permittees are requiring project proponents to develop and implement site-specific WQMPs. This Order requires the Permittees to verify functionality of post-construction structural BMPs prior to issuance of certificate of occupancy and to track and ensure long term operation and maintenance of post-construction BMPs in approved WQMPs.

10. An audit of each of the Permittees' storm water management programs during the third-term permit indicated a need for improved integration of the watershed protection principles, including LID techniques, specified in the WQMP into the Permittees' General Plan or related documents such as Development Standards, Zoning Codes, Conditions of Approval, Project Development Guidance, etc. It appears that many of the existing procedures, Development Standards, Ordinances and Municipal Codes may include barriers for implementation of LID techniques. This Order requires the Permittees to review and revise the Permittees' CEQA documentation, General Plan, Comprehensive or Master Plan, Municipal Codes, Subdivision Ordinances, Project Development Standards, Conditions of Approval or related documents to remove any barriers, as necessary, and within their control, for implementation of LID techniques and other requirements of this Order.

11. This Order requires the Permittees to ensure that Covenants, Conditions and Restrictions (CC&R) or other mechanisms for proper long term operation and maintenance of post-construction BMPs are carried out in perpetuity.

12. In addition to addressing post-development urban storm water quality, the WQMP includes requirements to protect environmentally sensitive areas and to address potential hydromodification issues that may result from each project. Section 2.3 of the WQMP requires identification of hydrologic conditions of concern (HCOC). An HCOC exists when a site's hydrologic regime is altered

and there are likely to be significant[30] impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects. Currently, new development and significant re-development projects are required to perform this assessment and incorporate appropriate BMPs to ensure existing hydrologic conditions are maintained. This Order requires the Permittees to implement, where feasible, LID techniques to minimize HCOC and supports the implementation of in-stream hydromodification protection and/or mitigation alternatives where appropriate.

13. Management of the impacts of urbanization on water quality, stream stability and aquatic habitats can sometimes be more effective if the techniques are implemented based on an overall watershed plan, whether done at the project site, within the neighborhood or within each municipality. During the third term permit, the Permittees initiated a watershed mapping project to develop a GIS-based map of the permitted area with the goal of identifying and developing specific action plans for protecting those segments of streams and channels that are vulnerable to impacts from urbanization.

14. This Order also requires the Permittees to develop a Watershed Action Plan to address cumulative impacts of development on vulnerable streams, preserve or restore to the maximum extent practicable the structure and function of streams in the permitted area, and protect surface water quality and groundwater recharge areas. The Watershed Action Plan should integrate hydromodification and water quality management strategies with land use planning policies, ordinances, and plans within each jurisdiction.

15. Pending approval of a Watershed Action Plan, the Permittees are required to address the impacts of urbanization as required under the approved model WQMP by requiring project proponents to develop and implement project-specific WQMPs.

16. If not properly designed and maintained, the structural treatment control BMPs could create a nuisance and/or habitat for vectors[31] (e.g., mosquitoes and rodents). Third term permit required the Permittees to closely collaborate with the local vector control agencies during the development and implementation of such treatment systems. The Permittees should continue these collaborative efforts with the vector control agencies to ensure that treatment control systems do not become a nuisance or a potential source of pollutants. The requirements specified in this Order include identification of responsible agencies for maintaining the systems and for providing funding for operation and maintenance.

17. If not properly designed and maintained, groundwater infiltration systems could also adversely impact groundwater quality. Restrictions placed on urban runoff

[30] It is expected that the current HCOC mapping effort and stream/risk characterization effort will define what should be considered as significant impact or stream vulnerability to hydromodification on a watershed basis.

[31] Managing Mosquitoes in Stormwater Treatment Devices, Marco E. Metzger, University of California Davis, Division of Agriculture and Natural Resources, Publication 8125.

infiltration in this Order (Section XI.D.8) are based on recommendations provided by the USEPA Risk Reduction Laboratory. The Permittees should continue to work closely with the water districts and water conservation districts to ensure groundwater protection.

H. **Municipal Inspection Programs**

1. The Permittees are required to conduct inspections of construction sites, industrial facilities, and commercial establishments. An evaluation of the Permittees' inspection programs during the third-term permit indicated a wide range of compliance and non-compliance with the inspection requirements. In many instances, the facilities' return to compliance was not properly documented. This Order includes requirements for a more effective inspection program and includes a performance measure, time to return to compliance, as a metric for program effectiveness.
2. During the third term, the Permittees initiated development of a risk-based prioritization scheme to prioritize facilities for inspections. In the absence of an approved risk-based prioritization scheme, the Permittees are required to use the prioritization methodology specified in the third-term permit. Upon approval of the risk-based prioritization scheme, the Permittees are required to utilize that system to prioritize their inspections.

I. **Illegal Discharges/Illicit Connections**

1. Illegal discharges to the MS4s could contribute to storm water and other surface water contamination. During the second term permit, the Permittees completed a reconnaissance survey of their open channels and underground storm drains to detect and eliminate any illicit connections (undocumented or unpermitted connections to the MS4s). The Permittees have trained their staff on illegal discharge surveillance/cleanup procedures. Audits conducted during the third-term permit indicated that this program element is generally carried out through complaint response. This Order requires each Permittee to revise this program element based on the Center for Watershed Protection's Illegal Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments.

J. **Technology-Based Effluent Limitations (Not Applicable)**

K. **Non-storm Water/De-Minimus Discharges**

1. The MS4s generally convey non-storm water flows such as irrigation runoff, runoff from non-commercial car washes, runoff from miscellaneous washing and cleaning operations, and other nuisance flows generally referred to as de-minimus discharges. Federal regulations, 40 CFR Part 122.26(d)(2)(i)(B), prohibit the discharge of non-storm water containing pollutants into the MS4s and to Waters of the U.S. unless they are regulated under a separate NPDES permit or are exempt as indicated in Effluent Limitations and Discharge Specifications,

Section V.A of this Order. On March 24, 2009, the Regional Board adopted Order No. R8-2009-0003, to address de-minimus types of discharges. The Permittees need not get coverage under the de-minimus permit for the types of discharges listed under Section V.B, as long as they are in compliance with the conditions specified in this Order and the substantive requirements of Order No. R8-2009-0003.

L. **Water Quality-Based Effluent Limitations (WQBELs) and TMDL WLA**

1. 40 CFR 122.44(d) requires that permits include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving waters. Where numeric water quality criteria have not been established, 40 CFR 122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a), proposed state criteria or a state policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter. In *Defenders of Wildlife, et al* v. *Browner,* No. 98–71080 (9th Circuit, October 1999). The Court held that the CWA does not require "strict compliance" with State water quality standards for MS4 permits under section 301(b)(1)(C), but that at the same time, the CWA does give EPA discretion to incorporate appropriate water quality-based effluent limitations under another provision, CWA section 402(p)(3)(B)(iii). 40 CFR 122.44(k)(3) allows the use of BMPs to control or abate the discharge of pollutants when numeric effluent limitations are infeasible or when practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. The legislative history and the preamble to the federal storm water regulations indicated that Congress and the USEPA were aware of the difficulties in regulating urban and storm water runoff solely through traditional end-of-pipe treatment. It is the Regional Board's intent to require the Permittees to implement best management practices consistent with the MEP standard in order to support attainment of water quality standards. This Order includes receiving water limitations based on applicable water quality standards; it prohibits the creation of nuisance and requires the reduction of water quality impairment in receiving waters. The Permit includes a procedure for determining whether storm water discharges are causing or contributing to exceedances of receiving water limitations and for evaluating whether the MSWMP must be revised to include additional or more effective BMPs designed to meet water quality standards. The Order establishes an iterative process to determine compliance with the receiving water limitations.

2. To support attainment of water quality standards, consistent with MEP, this Order requires the Permittees to implement a number of management practices and an iterative process to ensure that water quality standards are achieved. The Permittees are required to:

   a. Implement BMPs at all their facilities and for all their activities,

b. Require BMPs, including, where appropriate, LID techniques, to be implemented at new and re-development project sites prior to accepting discharge from these sites into their MS4s,

c. Implement and annually evaluate the MSWMP and each Permittee's LIP for effectiveness in reducing pollutants in urban and storm water runoff, and

d. Perform monitoring and reporting to determine the adequacy of BMPs within the permitted area and to determine the pollutants of concern based on comparisons of monitoring data with the applicable water quality standards.

3. Federal regulations (40 CFR 122.44(d)(1)(vii)(B) require inclusion of effluent limits that are "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." Consistent with this requirement, this Order includes a process for developing a BMP-based approach, which, if adopted by the Regional Board prior to the compliance date(s) specified in the associated TMDL Implementation Plan, shall become the final water quality-based effluent limitation(s). Permittees are required to submit a BMP-based comprehensive plan (comprehensive plan) describing the proposed BMPs and the documentation demonstrating that the BMPs are expected to attain the WLAs by the compliance dates when implemented. Once the Regional Board approves this comprehensive plan, this Order will be amended to include the comprehensive plan as the final water quality-based effluent limit that is consistent with the WLAs. If the Regional Board does not approve the comprehensive plan prior to the compliance date(s), the WLAs will become the final water quality-based effluent limits on the applicable compliance date and will remain in effect until a BMP comprehensive plan is approved by the Regional Board. The comprehensive plan will be updated, as necessary, to reflect evaluations of the effectiveness of the BMPs, including evaluations presented in the annual reports. The WLAs for Big Bear Lake Nutrient TMDLs are currently being achieved. The Permittees in the Big Bear Lake area are required to continue to implement BMPs (specific tasks identified in the Big Bear Lake Nutrient TMDL Implementation Plan) and to monitor to ensure continued compliance with the WLAs.

4. If water quality standards in the impaired receiving waters are met through implementation of appropriate control measures, this would constitute compliance with the effluent limits.

5. Maximum daily concentration limits are also included for de-minimus types of discharges from Permittee owned and/or operated facilities and activities and for total dissolved solids and total inorganic nitrogen for dry weather discharges.

M. **Water Quality Control Plan (Basin Plan)**

1. The Regional Board adopted a revised Water Quality Control Plan for the Santa Ana River Basin (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality

objectives, and contains implementation programs and policies to achieve those objectives for all waters in the Santa Ana Region addressed through the Plan.

2. More recently, the Basin Plan was amended significantly to incorporate revised boundaries for groundwater sub-basins, now termed "management zones", new nitrate-nitrogen and TDS objectives for the new management zones, and new nitrogen and TDS management strategies applicable to both surface and ground waters. This Basin Plan Amendment (R8-2004-0001) was adopted by the Regional Water Board on January 22, 2004. The State Water Resources Control Board (State Water Board) and Office of Administrative Law (OAL) approved Order No R8-2004-0001 on September 30, 2004 and December 23, 2004, respectively. The U.S. Environmental Protection Agency approved the surface water quality standards and related provisions of Order R8-2004-0001 on June 20, 2007. Order R8-2004-0001 includes TDS/TIN limits for direct dry weather discharges into surface waters within the permitted area based on the objectives specified in Table 4-1 of the Basin Plan, as amended. Storm water was considered to be an insignificant source for nitrogen/TDS in groundwater. These amendments were all incorporated into and updated in a single revised basin plan in February 2008.

3. In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic water supply. Beneficial uses recognized in the Basin Plan for surface waters in the permitted area are as follows:

   a. Municipal and Domestic Supply,
   b. Agricultural Supply,
   c. Industrial Service Supply,
   d. Industrial Process Supply,
   e. Groundwater Recharge,
   f. Hydropower Generation,
   g. Water Contact Recreation,
   h. Non-contact Water Recreation,
   i. Warm Freshwater Habitat,
   j. Limited Warm Freshwater Habitat,
   k. Cold Freshwater Habitat,
   l. Preservation of Biological Habitats of Special Significance,
   m. Wildlife Habitat,
   n. Rare, Threatened or Endangered Species, and
   o. Spawning, Reproduction, and Development

   The existing and potential beneficial uses of groundwater that could be impacted by the discharge of urban and storm water runoff within the permitted area include the following:

   a. Municipal and Domestic Supply,
   b. Agricultural Supply,

c. Industrial Service Supply, and
d. Industrial Process Supply

4. The Basin Plan also incorporates by reference all State Board water quality control plans and policies including the 1990 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and the 1974 Water Quality Control Policy for Enclosed Bays and Estuaries of California (Enclosed Bays and Estuaries Plan). This Order implements the Basin Plan and other statewide plans and policies incorporated into the Basin Plan.

N. National Toxics Rule (NTR) and California Toxics Rule (CTR)

Regional Board believes that compliance with water quality standards through implementation of best management practices is appropriate for regulating urban and storm water runoff. EPA articulated this position on the use of BMPs in storm water permits in the policy memorandum entitled, "Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits" (61 FR 43761, August 9, 1996).[32] NTR and CTR are blanket water quality criteria that apply to all surface water discharges. Water quality objectives specified in the Basin Plan are local numeric and narrative objectives that may be more stringent than the national or statewide water quality criteria.

O. State Implementation Policy (SIP) (Not Applicable)

See Section N., above.

P. Compliance Schedules and Interim Requirements

The Basin Plan contains schedules for achieving compliance with wasteload allocations for MSAR TMDLs and the Big Bear Lake Nutrient TMDLs. This Order requires the Permittees within these watersheds to comply with those time schedules for various deliverables as specified in the approved implementation plans. Consistent with the State Board's Compliance Schedule Policy, Resolution No. 2008-0025, this Order incorporates interim and final effluent limits, where appropriate. Additionally, since the final TMDL compliance dates are outside the term of this permit, this Order also requires the Permittees to monitor and report the effectiveness of BMPs implemented to evaluate progress towards attainment of TMDL WLAs by the time schedules specified in the implementation plans.

Q. Antidegradation Policy

40 CFR 131.12 requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the

[32]See discussions on Wet Weather Flows in the Federal Register/Vol. 65, No. 97/Thursday, May 18, 2000/Rules and Regulations

federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet, the permitted discharges are consistent with the antidegradation provisions of 40 CFR 131.12 and State Board Resolution No. 68-16.

R. **Anti-Backsliding**

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations of 40 CFR 122.44(*l*) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order. Therefore this Order conforms with the anti-backsliding requirements of the CWA.

S. **Public Education/Participation**

1. Public participation during the development of urban runoff management programs and implementation plans is necessary to ensure that all stakeholder interests and all applicable control measures are considered. In addition, the storm water regulations require public participation in the development and implementation of the storm water management program. As such, the Permittees are required to solicit and consider all comments received from the public and submit copies of the comments to the Executive Officer of the Regional Board with the annual reports. In response to public comments, the Permittees may modify reports, plans, or schedules prior to submittal to the Executive Officer.

2. Urban runoff can contain pollutants from privately owned and operated facilities such as residences, businesses and commercial establishments, and from public and private institutions. A successful storm water management program should include the participation and cooperation of public entities, private businesses, and public and private institutions. The MSWMP recognizes public education as a critical element. As the population increases in the permitted area, it will be even more important to continue to educate the public regarding the impact of human activities on the quality of urban runoff.

3. In addition to the Regional Board, a number of other stakeholders are involved in the management of the water resources of the Region. These include, but are not limited to, the incorporated cities in the Region, Publicly Owned Treatment Works, Orange, Riverside, and San Bernardino counties, and the Santa Ana Watershed Project Authority and its member agencies. The entities listed in Attachment 3 are considered as potential dischargers of urban runoff in the permitted area. It is expected that these entities will also work cooperatively with the Permittees to manage urban runoff. The Regional Board, pursuant to 40 CFR 122.26(a), has the discretion and authority to require non-cooperating

entities to participate in this Order, or to issue individual discharge permits to these entities.

4. Cooperation and coordination among the stakeholders (regulators, Permittees, the public, and other entities) are critical to optimize the use of finite public resources, and to ensure economical management of water quality in the Region. Recognizing this fact, this Order focuses on watershed management and seeks to integrate the programs of the stakeholders, especially the Permittees under the Orange, Riverside, and San Bernardino County MS4 permits within the Santa Ana Watershed.

5. Public education is an important aspect of every effective urban runoff management program and can promote changes in behavior at a societal level. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect receiving water quality and how adverse effects can be minimized.

6. Some urban runoff issues, such as general education and training, can be effectively addressed on a regional basis. Regional approaches to urban runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs. In particular, the counties of San Bernardino, Riverside and Orange and the municipalities within these counties are encouraged to cooperatively work together and generate a unified education and training program.

T. **Monitoring and Reporting**

1. 40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements.

2. An effective monitoring program should characterize urban runoff, identify problem areas, determine the impact of urban runoff on receiving waters and assess the effectiveness of BMPs. The Principal Permittee administers and conducts the storm water monitoring program for the Permittees. The third-term Permit includes only wet weather monitoring of MS4 outfalls and receiving waters.

3. The Regional Board and the Permittees recognize the importance of watershed management initiatives and regional planning and coordination in the development and implementation of programs and policies related to water quality protection, including urban runoff and TMDL programs. A number of such efforts are underway where the Permittees are active participants, including the Storm Water Quality Standards Task Force, the Middle Santa Ana River Watershed TMDL Task Force, and the Big Bear TMDL Task Force. This Order encourages continued participation in such programs. Furthermore, this Order recognizes that some of these planning efforts may result in significant changes

to the Basin Plan. If this occurs, the Regional Board may reopen the permit to modify applicable terms and conditions through a public hearing process. In addition, the Regional Board also recognizes that in certain cases it may be necessary and appropriate to fund regional water quality monitoring programs by reallocating funds from lower priority local monitoring programs. The Executive Officer is authorized to approve, after public notification and consideration of all comments received, changes to the watershed management initiatives, regional planning and coordination activities and regional monitoring programs. If the Executive Officer receives any significant comments during the public notification process that cannot be resolved, it shall be scheduled for a public hearing during a regularly scheduled Board meeting. To improve the effectiveness of adopted TMDLs and TMDLs that are expected to be adopted in the near future, this Order requires the Permittees to develop an Integrated Watershed Monitoring Plan that will comprehensively integrate the various urban run-off related monitoring programs, TMDLs and program effectiveness assessments. The Monitoring and Reporting Program is provided in Attachment 5.

4. The Stormwater Monitoring Coalition[33], with technical guidance from the Southern California Coastal Water Research Project prepared "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California", August 2004 Technical Report No. 419. This report indicated that "...the lack of mass emissions stations in the inland counties hampers their ability to estimate the proportional contribution of these inland areas to cumulative loads downstream." Accordingly, the Monitoring and Reporting Section requires the establishment of urban discharge mass emission stations. An integrated Watershed Monitoring Plan should address any shortcomings in the overall monitoring programs and avoid duplicative efforts within the same watershed.

5. The Storm Water Monitoring Coalition, in partnership with the Southern California Coastal Water Research Project, is conducting a Regional Bioassessment Monitoring effort. This Order requires the Permittees to continue their participation in this regional effort.

U. Standard and Special Provisions

Standard Provisions, reporting requirements, and notifications which apply to all NPDES permits are specified in Federal NPDES Regulation 40 CFR122.41, and additional conditions applicable to specified categories of permits are specified in 40 CFR 122.42. The discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR 122.42.

[33] The Stormwater Monitoring Coalition consists of representatives from the Counties of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego, the Cities of Long Beach and Los Angeles, the SWRCB, CRWQCB Regions 4, 8, and 9, the USEPA, and Caltrans.

V. **Notification of Interested Parties**

The Regional Board has notified the dischargers and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet of this Order.

W. **Consideration of Public Comment**

The Regional Board has notified the Permittees, all known interested parties, and the public of its intent to issue waste discharge requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and the requirements of this Order.

X. **Alaska Rule**

On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR 131.21, 65 FR 24641, April 27, 2000). Under the revised regulation (also known as the Alaska rule), USEPA must approve new and revised standards submitted to USEPA after May 30, 2000 before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000 may be used for CWA purposes, whether or not approved by USEPA.

Y. **Compliance with CZARA**

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Section 6217(g), requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category. Compliance with requirements specified in this Order relieves the Permittees of developing a non-point source plan, for the urban category, under CZARA. .

Z. **Stringency Requirements for Individual Pollutants (Not Applicable)**

PERMIT REQUIREMENTS:

IT IS HEREBY ORDERED that the Permittees, in Order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act, as amended, and the regulations and guidelines adopted thereunder, shall comply with the following:

III. PERMITTEE RESPONSIBILITIES

A. Responsibilities of the Principal Permittee:

1. The Principal Permittee shall be responsible for managing the overall storm water program and shall:

   a. Conduct chemical, biological, bacteriological water quality and other monitoring as required by this Order and any additional monitoring directed by the Executive Officer.

   b. Prepare and submit to the Executive Officer of the Regional Board, unified reports, plans, and programs necessary to comply with this Order.

   c. Coordinate and conduct Management Committee meetings as specified in the MSWMP.

   d. Coordinate permit activities and participate in any subcommittees formed as necessary, to coordinate compliance activities with this Order.

   e. Provide technical and administrative support and inform the Co-Permittees of the progress of other pertinent municipal programs, pilot projects, research studies, and other information to facilitate implementation of Co-Permittees' storm water program.

   f. Coordinate the implementation of area-wide storm water quality management activities such as the monitoring program, public education, pollution prevention, etc.

   g. Gather and disseminate information on the progress of statewide municipal storm water programs and evaluate the information for potential use in the execution of this Order.

   h. Monitor the implementation of the plans and programs required by this Order and determine their effectiveness in attaining water quality standards.

   i. Coordinate with the Regional Board on activities pertaining to implementation of this Order, including the submittal of all reports, plans, and programs as required under this Order.

   j. Develop and implement mechanisms, performance standards, design standards, etc., and assist in the consistent implementation of BMPs to the maximum extent practicable among the Permittees.

   k. Cooperate in watershed management programs and regional and/or statewide monitoring programs.

   l. Solicit and coordinate public input for any proposed major changes to areawide storm water management programs (MSWMP) and implementation plans.

   m. In collaboration with the Co-Permittees, develop guidelines for defining expertise and competencies of storm water program managers and inspectors

and develop and submit for approval a training program for various positions in accordance with these guidelines

n. Within 18 months of permit adoption, the Principal Permittee shall coordinate a review of areawide documents with the Co-Permittees to determine the need for update or revisions and establish a schedule for those revisions. These documents include but are not limited to the Enforcement Consistency Guide, the Municipal Activities Pollution Prevention Strategy, Water Quality Management Plan Guidance and Template, BMP brochures and other areawide documents.

o. Within 6 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees, shall develop and submit an area-wide model Local Implementation Plan (LIP) to the Executive Officer of the Regional Board. The submitted model LIP shall be deemed acceptable to the Regional Board if the Executive Officer raises no written objections within 30 days of submittal. The model LIP should describe each program element per the MSWMP; the departments and personnel responsible for its implementation; applicable standard operating procedures, plans, policies, checklists, and drainage area maps; and tools and resources needed for its implementation. The model LIP should also establish internal and external reporting and notification requirements to ensure accountability and consistency. The model LIP should also describe the mechanisms, procedures, and/or programs whereby the Permittees' individual LIPs will be coordinated through the WAP.

2. In addition, the activities of the Principal Permittee shall include but not be limited to the following for MS4 systems owned or operated by the Principal Permittee:

   a. Within 18 months of adoption of this Order, the Principal Permittee shall develop and implement a Principal Permittee-specific LIP, based on the areawide model LIP. A copy of the LIP, signed by the Chair of the Board of Directors for the Principal Permittee, shall be submitted to the Executive Officer within 18 months of the adoption of this Order.

   b. Take appropriate enforcement actions necessary to ensure compliance with Water Quality Management Plans, ordinances, implementation plans, and other applicable plans and policies.

   c. Inspect, clean, and maintain the MS4 systems within its jurisdiction consistent with the MEP standard.

   d. Review Water Quality Management Plans or other post-construction management plans requiring local agency permits.

   e. Prior to accepting permanent connections to its MS4 from entities outside its jurisdictional authority, the Principal Permittee shall notify the entities in writing of the General Stormwater Permit (Order No. 2009-0009-DWQ) post-construction standards and the regulatory requirements for control of pollutants in MS4 discharges (including relevant requirements from the MSWMP and WQMP), where feasible, and consistent with the MEP standard. A WQMP

approved by the Co-Permittee with jurisdictional authority may constitute compliance with the General Construction Permit post-construction requirements[34].

f. Review and revise, if necessary, policies and ordinances necessary to establish and maintain adequate legal authority, as required by the federal storm water laws and regulations.

g. Respond to or arrange for responding to emergency situations such as accidental spills, leaks, illicit connections/illegal discharges, etc., to prevent or to reduce the discharge of pollutants to storm drain systems and Waters of the U.S.

h. Track, monitor, and keep training records of all personnel involved in the implementation of the Principal Permittee's LIP.

i. Implement management programs, monitoring programs, and related plans as required by this Order.

j. Solicit and coordinate public input for any proposed major changes to its LIP, the MSWMP, and/or Model WQMP, as appropriate.

B. Responsibilities of the Co-Permittees

1. Within 18 months of adoption of this Order, each Co-Permittee shall develop and implement an LIP for its jurisdiction. The LIP shall describe the Co-Permittee's legal authority, its ordinances, policies and standard operating procedures; identify departments and personnel for each task and needed tools and resources. The LIP shall establish internal departmental coordination and reporting requirements to ensure accountability and consistency. Within 18 months from the adoption of this Order, each Co-Permittee shall adopt a Permittee-specific LIP, based on the areawide model LIP. The LIP shall have the written approval of the Permittee's City Manager or County Supervisor prior to its implementation and shall be updated on an as needed basis. Each Permittee's approved LIP shall be submitted, in electronic format, to the Executive Officer within 18 months of the adoption of this Order.

2. Each Co-Permittee shall be responsible for managing the storm water program within its jurisdiction and shall:

   a. Implement all applicable program elements including but not limited to the management programs, monitoring programs, implementation plans and appropriate BMPs outlined in the MSWMP and the LIP within each respective jurisdiction, and take such other actions as may be necessary to meet the maximum extent practicable (MEP) standard.

   b. Review and revise policies and ordinances necessary to establish and maintain adequate legal authority as stated in Section VI.1 of this Order and

[34] The State General Construction Permit Order No. 2009-0009-DWQ Section XIII

as required by the federal storm water regulations, 40CFR, Part 122.26(d)(2)(i)(A-F).

c. Obtain public input for any proposed major changes to its storm water management program and implementation plans.

d. Inspect, clean, and maintain the MS4 systems within its jurisdiction.

e. Maintain up-to-date GIS-based MS4 facility maps. Annually review these maps and, if necessary, submit revised maps to the Principal Permittee for integration with the HCOC mapping and with the information required for preparation of the Annual Report.

f. Prepare and submit to the Principal Permittee in a timely manner all required information necessary to develop a unified Annual Report for submittal to the Executive Officer of the Regional Board.

3. The Co-Permittees' activities shall include, but not be limited to, the following:

a. Designate at least one representative to the Management Committee and attend at least 7 out of the 8 Management Committee meetings per year. The Principal Permittee shall be notified immediately, in writing, of any changes to the designated representative to the Management Committee.

b. Conduct, and/or coordinate with the Principal Permittee to conduct, any surveys and/or characterizations needed to identify pollutant sources from specific drainage areas.

c. Review and comment on all plans, strategies, management programs, monitoring programs, as developed by the Management Committee, the Principal Permittee or any subcommittee to comply with this Order.

d. Participate in committees or subcommittees formed to address storm water related issues to comply with this Order.

e. Respond to or arrange for responding to emergency situations such as accidental spills, leaks, illegal discharges/illicit connections, etc. to prevent or reduce the discharge of pollutants to storm drain systems and Waters of the U.S.

f. Pursue enforcement actions as necessary within its jurisdiction for violations of storm water ordinances, prohibitions on illicit connections and illegal discharges, and other elements of its storm water management program.

g. Track, monitor, and keep training records of all personnel involved in the implementation of its LIP.

h. Track and monitor operation and maintenance of post-construction BMPs installed in areas within each Permittee's jurisdiction.

i. Prior to accepting permanent connections to its MS4 from entities outside its jurisdictional authority, the co-Permittee shall notify these entities in writing of General Stormwater Permit post-construction standards and the regulatory requirements for control of pollutants in MS4 discharges (including relevant

requirements from the MSWMP and WQMP), where feasible, and consistent with the MEP standard. A WQMP approved by the Co-Permittee with jurisdictional authority may constitute compliance with the General Construction Permit post-construction requirements[35]. The Permittees will also send these notifications to the Regional Board.

j. Track and monitor operation and maintenance of post-construction BMPs installed in areas within each Permittee's jurisdiction.

C. Implementation Agreement

1. As needed, the Permittees shall evaluate the storm water management structure and the Implementation Agreement and determine the need for any revision. The annual report shall include the finding of any such review and provide a schedule if revisions are planned. The Implementation Agreement shall be reviewed and revised, if necessary, to include any cities that were not signatories to this agreement or other non-traditional entities that own or operate conveyance systems within the permitted area. See Attachment 3. If the Implementation Agreement is revised, a copy of the signature page and any revisions to the Agreement shall be included in the annual report.

IV. DISCHARGE PROHIBITIONS

A. In accordance with the requirements of 40 CFR 122.26(d)(2)(i)B) and 40 CFR 122.26(d)(2)(i)(F), the Permittees shall prohibit illegal connections and illicit discharges (non-storm water) from entering municipal separate storm sewer systems unless such discharges are either authorized by a NPDES permit or Waste Discharge Requirements issued by the Regional Board, or not prohibited in accordance with Section V, below.

B. The discharge of Urban Runoff from Permittees' municipal separate storm sewer systems, containing pollutants, including trash and debris that have not been reduced to the maximum extent practicable, to waters of the U. S. is prohibited.

C. The Permittees shall effectively prohibit the discharge of non-storm water into the MS4s unless authorized by a separate NPDES permit, granted a waiver or as otherwise specified in Section V, below.

D. Non-storm water discharges from Permittee activities into Waters of the U.S. are prohibited unless the non-storm water discharges are permitted by a NPDES permit, granted a waiver, or are as otherwise specified in Section V, below.

E. Discharges from the MS4s shall be in compliance with the discharge prohibitions contained in Chapter 5 of the Basin Plan.

F. Discharges into and from the MS4s in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance, as that term is defined in Section 13050 of the Water Code, into waters of the State are prohibited.

[35] The State General Construction Permit Order No. 2009-0009-DWQ Section XIII

G. The discharge to Waters of the U.S., of any substances in concentrations toxic to animal or plant life is prohibited.

H. The discharge to Waters of the U.S., of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.

V. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

For purposes of this Order, a discharge may include storm water or other types of discharges identified below.

A. Authorized Discharges:

The discharges identified below need not be prohibited by the Permittees except if identified by the Permittees or the Executive Officer as a significant source of pollutants or as a significant vehicle that may cause pollutants to migrate to Waters of the U.S. The MSWMP shall include public education and outreach activities directed at reducing these discharges even if they are not substantial contributors of pollutants to the MS4s and/or the receiving waters.

1. Discharges composed entirely of storm water;
2. Air conditioning condensate;
3. Irrigation water. These discharges shall be minimized through public education and water conservation efforts. Also see Section X.E, Residential Program, and Section C., Nonpoint Source Discharges, below;
4. Passive foundation drains[36];
5. Passive footing drains[37];
6. Water from crawl space pumps[38];
7. Non-commercial vehicle washing, ,e.g. residential car washing (excluding engine degreasing) and car washing for fundraisers by non-profit organizations[39];
8. Dechlorinated swimming pool discharges (cleaning wastewater and filter backwash shall not be discharged into the MS4s or to Waters of the U.S.)
9. Diverted stream flows[40];

[36]The discharge is allowed only if the source water drained from the foundation is stormwater or uncontaminated groundwater. Discharges from contaminated groundwater may require coverage under the General Groundwater Cleanup Permit (Order No. R8-2007-0008, NPDES Permit No CAG918001) or its latest version.

[37]Only uncontaminated discharge is allowed. Otherwise, coverage under Order No. R8-2007-0008 may be required.

[38]The discharge is allowed only if it is uncontaminated; otherwise permit coverage under the General Permit for Discharges from Utility Vaults and Underground Structures, Water Quality Order No. 2006-0008-DWQ (NPDES No. CAG990002) may be required.

[39]Charity car washes should be limited to bona-fide 501 agencies.

[40]Diversion of stream flows that encroach into Waters of the U.S. requires a 404 permit from the U.S. Army Corps of Engineers and a 401 Water Quality Certification from the Regional Board. Stream diversion that requires active pumping may also require coverage under the De Minimus Permit, Order No. R8-2009-0003.

10. Rising ground waters and natural springs[41];
11. Uncontaminated ground water infiltration as defined in 40 CFR 35.2005 (20) and uncontaminated pumped groundwater,
12. Flows from riparian habitats and wetlands;
13. Emergency fire fighting flows (i.e., flows necessary for the protection of life and property do not require BMPs and need not be prohibited. However, appropriate BMPs to reduce the discharge of pollutants consistent with the MEP standard must be implemented when they do not interfere with health and safety issues.
14. Waters not otherwise containing wastes as defined in California Water Code Section 13050 (d), and
15. Other types of discharges identified and recommended by the Permittees and approved by the Regional Board.
16. The Permittees must evaluate the authorized discharges listed above to determine if any are a significant source of pollutants to the MS4, and notify the Executive Officer if any are a significant source of pollutants to the MS4. If the Permittee determines that any are a source of pollutants that exceed water quality standards, the Permittee(s) shall either:
    a. Prohibit the discharge from entering the MS4; or
    b. Authorize the discharge category and ensure that "Source Control BMPs" and Treatment Control are implemented to reduce or eliminate pollutants resulting from the discharge; or
    c. Require or obtain coverage under a separate Regional Board or State Board permit for discharge into the MS4.

B. **Discharge Specifications/De-Minimus Discharges from Permittee Owned and/or Operated Facilities/Activities:**

1. The Permittees shall prohibit the following categories of non-storm water discharges (de minimus discharges) into Waters of the U.S. from Permitttee-owned and/or operated facilities/activities unless the stated conditions are met. The de minimus types of discharges listed in the General De Minimus Permit shall be in compliance with the Regional Board's General De Minimus Permit for Discharges to Surface Waters, Order No. R8-2009-0003, NPDES No. CAG 998001:
    a. Discharges from potable water sources, including water line flushing, superchlorinated water line flushing; discharges resulting from the maintenance of potable water supply pipelines, tanks, reservoirs, etc.; discharges from potable water supply systems resulting from initial system startup, routine startup, sampling activities, system failures, pressure release, etc.; fire hydrant system testing or flushing; and hydrostatic test water: Planned discharges shall be dechlorinated to a

[41] Discharge of rising ground water and natural springs into surface water is only allowed if the groundwater is uncontaminated. Otherwise, coverage under Order No. R8-2007-0008 may be required.

concentration of 0.1 ppm[42] or less, pH adjusted if necessary, and volumetrically and velocity controlled to prevent hydrologic conditions of concern in receiving waters.

b. Dechlorinated swimming pool discharges: Dechlorinated to a concentration of 0.1 ppm[43] or less, pH adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent hydrologic condition of concern in receiving waters. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4s or to Waters of the U.S.

c. Construction dewatering wastes[44] and dewatering wastes from subterranean seepage[45], except for discharges from utility vaults: The following limits shall be met at approved monitoring locations. The maximum daily concentration limit for total suspended solids shall not exceed 75 mg/l, sulfides 0.4 mg/l, oil and grease15 mg/l, total petroleum hydrocarbons 0.1 mg/l; the pH of the discharge shall be within 6.5 to 8.5 pH units and there shall be no visible oil and grease in the discharge.

d. Discharges from facilities that extract, treat and discharge water diverted from waters of the U.S[46]. These discharges shall meet the following conditions: (1) The discharges to Waters of the U.S. must not contain pollutants added by the treatment processes or pollutants in greater concentration than the influent; (2) The discharge must not cause or contribute to a condition of erosion; (3) The extraction and treatment must be in compliance with Section 404 of the Clean Water Act; and (4) Conduct monitoring in accordance with Monitoring and Reporting Program attached to this Order.

2. Discharges from lawn, greenbelt and median watering and other irrigation runoff[47] from Permittee's facilities shall be minimized through water conservation efforts. Also see Section X.E, Residential Program

3. Table 4-1 of the Basin Plan incorporates TDS/TIN[48] limits for direct discharges into surface waters in specified management zones within the Santa Ana Region. Permittees discharging to those receiving waters shall comply with the following for dry weather conditions.

   a. For discharges to surface waters, where groundwater will not be affected by the discharge, the maximum daily concentration (in mg/L) for TDS and/or TIN of the

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[42] Total residual chlorine = 0.1 mg/l or parts per million (ppm) or less; compliance determination shall be at a point before the discharge mixes with any receiving water.

[43] See footnote 42.

[44] Requirements for construction dewatering of stormwater are covered under the General Permit for Stormwater Discharges Associated with Construction Activity Order No. 99-08-DWQ.or the latest version. Where pollutants other than TSS, sulfides, oil and grease, TPH and pH are a concern in the groundwater, coverage under Order No. R8-2007-0008 may be required.

[45] Discharge of dewatering wastes from subterranean seepage into surface water is only allowed if the groundwater meets specifications. If other pollutants of concern are present or discharge specifications are exceeded, coverage under Order No. R8-2007-0008 may be required.

[46] Diversion of stream flows that encroach into Waters of the U.S. requires a 404 permit from the U.S. Army Corps of Engineers and a 401 Water Quality Certification from the Regional Board.

[47] Non-agricultural irrigation using recycled water must comply with the statewide permit for Landscape Irrigation Using Recycled Water and the State Department Health guidelines.

[48] TDS/TIN=Total dissolved solids/total inorganic nitrogen.

discharge shall not exceed the water quality objectives for the receiving surface water where the effluent is discharged, as specified in Table 4-1 of the Basin Plan.

b. For discharges to surface waters, where the groundwater will be affected by the discharge, the TDS and/or TIN concentrations of the effluent shall not exceed the water quality objectives for the surface water where the effluent is discharged and the affected groundwater management zone, as specified in Table 4-1 of the Basin Plan. The more restrictive water quality objectives shall govern. However, treated effluent exceeding the groundwater management zone water quality objectives may be returned to the same management zone from which it was extracted without reduction of the TDS or TIN concentrations so long as the concentrations of those constituents are no greater than when the groundwater was first extracted. Incidental increases in the TDS and TIN concentrations (such as may occur during air stripping) of treated effluent will not be considered as increases for the purposes of determining compliance with this discharge specification.

4 The Regional Board may add categories of non-storm water discharges that are not significant sources of pollutants or remove categories of non-storm water discharges listed above based upon a finding that the discharges are a significant source of pollutants.

5 See Section XV for additional requirements for de-minimus types of discharges.

C. **Non-point Source (NPS) Discharges**

Consistent with the State Water Resources Control Board's 2004 "Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program," the Regional Board may issue Waste Discharge Requirements for non-point source (NPS) pollutant discharges, such as agricultural irrigation runoff or return flows that are not subject to NPDES requirements, if identified as a significant source of pollutants. In addition, if the water quality significance of NPS discharges is not clearly understood, the Regional Board may issue conditional waivers of Waste Discharge Requirements to NPS dischargers, and require monitoring to gather the information necessary to effectively manage these discharges.

D. **Water Quality Based Effluent Limitations to Implement the Total Maximum Daily Loads (TMDLs)**

1. **The Middle Santa Ana River (MSAR) Watershed Bacterial Indicator TMDL-Interim WQBELs (effective upon adoption of this Order)**

a. The MSAR Permittees[49] shall:

[49] MS4 Permittees in the MSAR watershed (County, Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto and Upland) are collectively referred to as the "MSAR Permittees"

i. Continue to implement the watershed-wide water quality monitoring program (including any future amendments thereto) approved by the Regional Board (Resolution No. R8-2007-0046) as per Task 3 of the MSAR-TMDL Implementation Plan.

ii. Submit reports summarizing all relevant data from the watershed-wide water quality monitoring program. Beginning in 2010, the wet season report is due to the Executive Officer by May 31st of each year (for monitoring conducted from November 1st through March 31st) and the dry season report is due to the Executive Officer by December 31st of each year (for monitoring conducted from April 1st through October 31st).

iii. Submit comprehensive reports every three years summarizing the data collected for the preceding 3 year period and evaluating progress towards achieving the urban wasteload allocation by the dates specified in the TMDL. The first report is due to the Executive Officer on February 15, 2010.

iv. Continue to implement the approved (Regional Board Resolution No. R8-2008-0044) urban source evaluation plan (USEP) developed as per Task 4.1 of the MSAR-TMDL Implementation Plan. The USEP must describe the specific methods that will be used to identify urban sources and BMPs to address those sources. Submit semi-annual reports on January 31st and July 31st of each year as required under the approved USEP, and any amendments thereto. In years where the comprehensive report referenced in V.D.1.a.iii above is due on February 15, the comprehensive report, Dry Season report (Due December 31st) and the January 31st USEP reports may be combined into a single submittal due February 15th

v. Revise the Municipal Storm Water Management Plan (MSWMP) as specified in Task 4.2 of the MSAR-TMDL Implementation Plan. Summarize any such revisions in the annual report due to the Executive Officer by November 15 of each year.

vi. Revise the Water Quality Management Plan (WQMP) as specified in Task 4.4 of the MSAR-TMDL Implementation Plan. Summarize any such revisions in the annual report due by November 15 of each year.

vii. Amend the Local Implementation Plans (LIP) to be consistent with the revised MSWMP and WQMPs within 90 days after said revisions are approved by the Regional Board. Summarize any such LIP amendments in the annual report due November 15 of each year.

2. Final WQBELs for MSAR Bacterial Indicator TMDL under DRY Weather Conditions

a. The final WQBELs for bacterial indicators under Dry Weather Conditions contained in this section shall be achieved no later than December 31, 2015. These final effluent limits shall be considered effective for enforcement purposes on January 1, 2016.

b. The Final WQBELs for MSAR Bacterial Indicator TMDL under Dry Weather conditions shall be developed and implemented in the following manner.

i. The MSAR Permittees shall prepare for approval by the Regional Board a Comprehensive Bacteria Reduction Plan (CBRP) describing, in detail, the specific actions that have been taken or will be taken to achieve compliance with the urban wasteload allocation under dry weather conditions (April 1st through October 31st) by December 31, 2015. The CBRP must include:

(a) The specific ordinance(s) adopted to reduce the concentration of indicator bacteria in urban sources.

(b) The specific BMPs implemented to reduce the concentration of indicator bacteria from urban sources and the water quality improvements expected to result from these BMPs.

(c) The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of water quality objectives for indicator bacteria.

(d) The specific regional treatment facilities and the locations where such facilities will be built to reduce the concentration of indicator bacteria discharged from urban sources and the expected water quality improvements to result when the facilities are complete.

(e) The scientific and technical documentation used to conclude that the CBRP, once fully implemented, is expected to achieve compliance with the urban wasteload allocation for indicator bacteria by December 31, 2015.

(f) A detailed schedule for implementing the CBRP. The schedule must identify discrete milestones to assess satisfactory progress toward meeting the urban wasteload allocations for dry weather by December 31, 2015. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.

(g) The specific metric(s) that will be established to demonstrate the effectiveness of the CBRP and acceptable progress toward meeting the urban wasteload allocations for indicator bacteria by December 31, 2015.

(h) The MSWMP, WQMP and LIPs shall be revised consistent with the CBRP no more than 180 days after the CBRP is approved by the Regional Board.

(i) Detailed descriptions of any additional BMPs planned, and the time required to implement those BMPs, in the event that data from the watershed-wide water quality monitoring program indicate that water quality objectives for indicator bacteria are still being exceeded after the CBRP is fully implemented.

(j) A schedule for developing a CBRP needed to comply with the urban wasteload allocation for indicator bacteria during wet weather conditions (November 1st thru March 31st) to achieve compliance by December 31, 2025.

ii. The draft CBRP must be submitted to the Regional Board no later than December 31, 2010. The Permittees may submit the plan individually, jointly or through a collaborative effort with other urban dischargers such as the existing MSAR-TMDL Task Force. Regional Board staff will review the document and recommend necessary revisions no more than 90 days after receiving the draft plan. The MSAR Permittees must submit the final version of the plan no more than 90 days after receiving the comments from Regional Board staff. The Regional Board will schedule a public hearing to consider approving the CBRP, as a final water quality-based effluent limitation for the Dry Weather Urban Wasteload Allocation, no more than 120 days after the final plan is submitted by the MSAR Permittees. In approving the CBRP as the final WQBELs, the Regional Board shall make a finding that the CBRP, when fully implemented, shall achieve the urban wasteload allocations for indicator bacteria by no later than December 31, 2015.

iii. Once approved by the Regional Board, the CBRP shall be incorporated into this Order as the final WQBELs for indicator bacteria under Dry Weather Conditions. Based on BMP effectiveness analysis, the CBRP shall be updated, if necessary. The updated CBRP shall be implemented upon approval by the Regional Board.

c. Should the process set forth in subdivision, b, of this section not be completed by December 31, 2015, then the urban wasteload allocations for dry weather conditions specified in the MSAR-TMDL shall become the final numeric WQBELs for indicator bacteria in Dry Weather Conditions, effective January 1, 2016 as follows:

i. Wasteload Allocation for Fecal Coliform from Urban Sources in Dry Weather Conditions (April 1st through October 31st)[50]

5-sample/30-day logarithmic mean less than 180 organisms/100mL and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.

ii. Wasteload Allocation for *E. Coli* from Urban Sources in Dry Weather Conditions (April 1st through October 31st)

5-sample/30-day logarithmic mean less than 113 organisms/100 mL and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

3. Final WQBELs for MSAR Bacterial Indicator TMDL under WET Weather Conditions (effective Jan. 1, 2026)

In the event this Order is still in effect on December 31, 2025, and the Regional Board has not adopted alternative final water quality-based effluent limits for wet weather conditions by that date, then the urban wasteload allocations specified in the MSAR-TMDL for wet weather conditions (November 1st through March 31st) will automatically become the final numeric water quality-based effluent limits for the MSAR Permittees on January 1, 2026.

4. Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions

a. The City of Big Bear Lake, the County of San Bernardino and San Bernardino County Flood Control District (the Big Bear Lake MS4 Permittees) shall implement BMPs designed to assure continued compliance with the following urban wasteload allocation for phosphorus during dry hydrological conditions[51].

Total Phosphorus (lbs/yr)[52] = 475 (Compliance to be achieved by December 31, 2015)

b. The Big Bear Lake MS4 Permittees shall implement BMPs in the watershed so as not to exceed the urban WLA.for phosphorus.

c. The Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the Big Bear TMDL Task Force, shall implement the approved (Regional

[50]The fecal coliform WLA becomes ineffective upon the replacement of the REC1 fecal coliform objectives in the Basin Plan by approved REC1 objectives based on *E. Coli.*

[51]The Big Bear Lake MS4 Permittees are already meeting the WLAs. The TMDL for Dry Hydrological Conditions does not specify nutrient reductions from external watershed sources, including urban discharges (WLA), resorts and open space/forested lands (LAs), these external load dischargers are still responsible for reducing their contributions to the internal nutrient loads, which are lake sediment and macrophytes.

[52] Specified as an annual average for dry hydrological conditions.

Board Resolution No. R8-2008-0070) Big Bear Lake In-lake Nutrient Monitoring Plan dated November 30, 2007, or any lawfully approved amendments thereto. Annual Reports shall be submitted by February 15 of each year.

d. The Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the Big Bear TMDL Taskforce, shall implement the approved (Regional Board Resolution No. R8-2009-0043) Big Bear Lake Watershed-wide Nutrient Monitoring Plan (May 2009) in accordance with the schedules specified in Resolution No. R8-2009-0043, or any lawfully approved amendments thereto. Annual Reports shall be submitted by February 15 of each year.

e. No later than February 26, 2010, the Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the Big Bear TMDL Task Force, shall submit for approval a plan to evaluate the applicability and feasibility of various in-lake treatment technologies to control noxious and nuisance aquatic plants as described in Task 6C of the BBL-TMDL. The plan shall also include a description of the monitoring conducted and proposed to track aquatic plant diversity, coverage, and biomass. The monitoring data should address, at a minimum, progress toward achieving the numeric targets for macrophyte coverage and percentage of nuisance aquatic vascular plant species. The final approved plan shall be implemented in accordance with the approved schedule.

f. No later than March 31 2010, the Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the Big Bear TMDL Task Force, shall submit for approval a plan and schedule for updating the existing Big Bear Lake watershed nutrient model and the Big Bear Lake in-lake nutrient model as described in Task 6A of the BBL TMDL. The plan and schedule must take into consideration additional data and information that are or will be generated from the required TMDL monitoring programs as described in c and d above. The final plan shall be implemented in accordance with the approved schedule.

g. No later than April 15, 2010, the Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the Big Bear TMDL Task Force shall submit for approval a proposed plan and schedule for in-lake sediment nutrient reduction for Big Bear Lake as described in Task 6B of the BBL TMDL. The proposed plan shall include an evaluation of the applicability and feasibility of various in-lake treatment technologies to support development of a long-term strategy for control of nutrients from the sediment. The submittal shall also contain a proposed sediment nutrient monitoring program to evaluate the effectiveness of any strategies implemented. The final plan shall be implemented in accordance with the approved schedule.

h. The plans submitted in e, f, and g above comprise Task 6 of the BBL TMDL –the Big Bear Lake – Lake Management Plan. In addition, the plans submitted in e, f, and g above also must also address the following, either individually or holistically:

1. The plan shall be based on identified and acceptable goals for lake capacity, biological resources and recreational opportunities. Acceptable goals shall be identified in coordination with Regional Board staff and other responsible agencies, including the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

2. The plan shall include a proposed plan and schedule for the development of biocriteria for Big Bear Lake. This is intended to complement Regional Board efforts to develop biocriteria.

3. The plan must identify a scientifically defensible methodology for measuring changes in the capacity of the lake.

4. The proposed plan shall identify recommended short and long-term strategies for control and management of sediment and dissolved and particulate nutrient inputs to the lake to the extent that the permittees are responsible for these inputs over and above that which would occur naturally.

5. The plan shall also integrate the beneficial use map developed pursuant to the Regional Board's March 3, 2005, Clean Water Act Section 401 Water Quality Standards Certification for Big Bear Lake Nutrient/Sediment Remediation Project. The purpose of the beneficial use map is to correlate beneficial uses of the lake with lake bottom contours. The map is expected to be used in regulating future lake dredge projects to maximize the restoration and protection of the lake's beneficial uses.

i. The Big Bear Lake – Lake Management Plan shall be implemented upon Regional Board approval. Once approved, the plan shall be reviewed and revised as necessary at least once every three years. The review and revision shall take into account assessments of the efficacy of control/management strategies implemented and relevant requirements of new or revised TMDLs for Big Bear Lake and its watershed. Annual Reports shall be submitted by February 15 of each year.

j. The Big Bear Lake MS4 Permittees, individually or collectively, or in collaboration with the with the Big Bear TMDL Task Force shall submit an annual report by February 15 of each year summarizing all relevant data from both water quality monitoring programs and the Lake Management Plan as described in c, d, e, f, g, and h above and evaluating compliance with the WLA using the modeling tools developed pursuant to paragraph k, below.

k. Continued compliance with the WLA will be determined by watershed modeling. By March 31, 2010, the Big Bear Lake MS4 Permittees shall submit a final watershed modeling plan that is ready to be implemented and that details how the WLA will be determined and evaluated in future years. Upon approval by the

Regional Board, this watershed modeling plan shall be used to determine compliance with the WLA. The Big Bear Lake MS4 Permittees shall select a watershed model that best fits the conditions they are modeling and document the basis for that selection. Data collected under the approved watershed monitoring program shall be evaluated by the Big Bear Lake MS4 Permittees to determine if it falls within the range of dry hydrological conditions as specified in the Nutrient TMDL. The Big Bear Lake MS4 Permittees shall utilize data collected from the monitoring locations specified in the watershed monitoring program approved on May 22, 2009, as well as any other data that are deemed necessary to calibrate and validate the watershed model. The Big Bear Lake MS4 Permittees will document the basis for the selection of the model, the data evaluation and selection process, and the model calibration/validation process. The Big Bear Lake MS4 Permittees or the Big Bear Lake Task Force, shall provide the results of the first model update by February 15, 2011.

l. The Big Bear Lake MS4 Permittees shall revise the Municipal Storm Water Management Plan (MSWMP), Water Quality Management Plan (WQMP) and Local Implementation Plans (LIP) as necessary to implement the plans submitted pursuant to paragraphs c, d, e, f, and g of this section no later than 180 days after the Regional Board approves these plans. A summary of any such revisions shall be included in the area-wide annual report due November 15 of each year.

m. If water quality monitoring data and related modeling analyses indicate that the urban wasteload allocation for total phosphorus is being exceeded during dry hydrological conditions despite implementation of the lake management plan and the MSWMP and other requirements of this Order, the Big Bear Lake MS4 Permittees shall comply with the following procedure:

1. Each Big Bear Lake MS4 Permittee upstream of the monitoring locations where exceedances appear to be occurring shall evaluate and characterize discharges from its significant outfall locations.

2. The Big Bear Lake MS4 Permittees shall submit a report with proposed actions to the Executive Officer that describes the BMPs that are currently being implemented and any additional BMPs that will be implemented to reduce the controllable sources of phosphorus causing the exceedances of the urban wasteload allocation for total phosphorus. The report must be submitted as part of the annual report due in November 15 of each year.

n. **Storm Water Program Modification**: The Big Bear Lake MS4 Permittees shall revise their LIPs, as needed, to incorporate the requirements from TMDL implementation activities. These revisions shall include: (1) the results of the nutrient monitoring programs; (2) an evaluation of the effectiveness of the control measures in meeting the phosphorus WLAs; (3) any additional control measures

proposed to be implemented if the WLA or numeric targets are exceeded, including control measures for controlling nutrient inputs from new developments and/or new sources; and (4) a progress report evaluating progress towards meeting the WLAs (pre-compliance evaluation monitoring[53]).

5. Knickerbocker Creek Sole Source Pathogen Investigation and Control

a. The City of Big Bear Lake shall continue to participate in and implement the January 2008 Phase 2 Monitoring and Reporting Program in accordance with the agreed sampling locations, parameters, schedule, and protocol.

b. The City of Big Bear Lake shall annually review and revise, if necessary, the control measures implemented and undertake an iterative approach until water quality objectives within Knickerbocker Creek are attained, unless it can be demonstrated that the pathogen sources are from uncontrollable sources.

c. The City of Big Bear Lake shall continue to work with Regional Board staff and the Storm Water Quality Standards Task Force to review and update designated uses and related water quality objectives for Knickerbocker Creek. This may result in different water quality objectives for bacteria.

6. Big Bear Lake Mercury TMDL

Pending adoption of the Mercury TMDL, the City of Big Bear Lake shall participate in the development and implementation of monitoring programs and control measures, including any BMPs that the City is currently implementing or proposing to implement.

7. Compliance with WLAs

The determination of compliance with the WLAs shall be based on implementation of BMPs as specified in the implementation plans for the approved TMDLs or based on plans developed as per the approved TMDLs. The Permittees obligation to meet the WLAs is met if the water quality standards in the impaired receiving waters are met through implementation of control measures approved by the Regional Board.

VI. RECEIVING WATER LIMITATIONS

A. Discharges from the MS4s shall not cause or contribute to exceedances of receiving water quality standards (designated beneficial uses and water quality objectives) contained in Chapter 4 of the Basin Plan, and amendments thereto, for surface or groundwater.

B. The MSWMP and its components, including LIPs shall be designed to achieve compliance with receiving water limitations consistent with the MEP standard. It is

[53]Pre-compliance evaluation monitoring is monitoring conducted prior to the compliance date to evaluate effectiveness of pollution reduction efforts.

Exhibit E

Table C-1. 2006 – 2008 Thresholds for Construction and Operation with Gradual Conversion of NOx to NO_2

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	74	74	82	106	168	108	106	110	126	179
2	Northwest Coastal LA County	103	104	121	156	245	147	143	156	186	262
3	Southwest Coastal LA County	91	93	107	139	218	131	128	139	165	233
4	South Coastal LA County	57	58	68	90	142	82	80	87	106	151
5	Southeast LA County	80	81	94	123	192	114	111	121	145	205
6	West San Fernando Valley	103	104	121	157	245	147	143	156	187	263
7	East San Fernando Valley	80	81	94	122	191	114	111	121	144	204
8	West San Gabriel Valley	69	69	81	104	164	98	95	104	124	175
9	East San Gabriel Valley	89	112	159	251	489	128	151	200	284	513
10	Pomona/Walnut Valley	103	129	185	292	570	149	175	230	330	598
11	South San Gabriel Valley	83	84	96	123	193	121	118	126	147	206
12	South Central LA County	46	46	54	70	109	65	64	69	82	117
13	Santa Clarita Valley	114	115	133	173	273	163	159	172	204	291
15	San Gabriel Mountains	114	115	133	173	273	163	159	172	204	291
16	North Orange County	103	104	121	159	252	147	143	156	186	269
17	Central Orange County	81	83	98	123	192	115	114	125	148	205
18	North Coastal Orange County	92	93	108	140	219	131	128	139	165	235
19	Saddleback Valley	91	93	108	140	218	131	127	139	165	233
20	Central Orange County Coastal	92	93	108	140	219	131	128	139	165	235
21	Capistrano Valley	91	93	108	140	218	131	127	139	165	233
22	Norco/Corona	118	148	211	334	652	170	200	263	378	684
23	Metropolitan Riverside County	118	148	212	335	652	170	200	264	379	684
24	Perris Valley	118	148	212	335	652	170	200	264	379	684
25	Lake Elsinore	162	203	292	460	896	234	275	363	521	941
26	Temecula Valley	162	203	292	460	896	234	275	363	521	941
27	Anza Area	162	203	292	460	896	234	275	363	521	941
28	Hemet/San Jacinto Valley	162	203	292	460	896	234	275	363	521	941
29	Banning Airport	103	131	189	299	585	149	176	234	340	614
30	Coachella Valley	132	166	238	376	733	191	225	296	425	769
31	East Riverside County	132	166	238	376	733	191	225	296	425	769
32	Northwest San Bernardino Valley	118	148	211	334	652	170	200	263	378	684
33	Southwest San Bernardino Valley	118	148	211	334	652	170	200	263	378	684
34	Central San Bernardino Valley	118	148	211	334	652	170	200	263	378	684
35	East San Bernardino Valley	118	148	211	334	651	170	200	263	377	683
36	West San Bernardino Mountains	118	148	211	334	652	170	200	263	378	684
37	Central San Bernardino Mountains	118	148	211	334	652	170	200	263	378	684
38	East San Bernardino Mountains	118	148	211	334	651	170	200	263	377	683

Table C-1. 2006 – 2008 Thresholds for Construction and Operation with Gradual Conversion of NOx to NO_2 (Continued)

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary				
		5 Acre				
		25	50	100	200	500
1	Central LA	161	157	165	173	212
2	Northwest Coastal LA County	221	212	226	250	312
3	Southwest Coastal LA County	197	189	202	222	277
4	South Coastal LA County	123	118	126	141	179
5	Southeast LA County	172	165	176	194	244
6	West San Fernando Valley	221	212	226	250	313
7	East San Fernando Valley	172	165	176	194	242
8	West San Gabriel Valley	148	141	151	166	208
9	East San Gabriel Valley	203	227	286	368	584
10	Pomona/Walnut Valley	236	265	330	426	681
11	South San Gabriel Valley	183	176	184	202	245
12	South Central LA County	98	94	101	111	139
13	Santa Clarita Valley	246	236	251	275	345
15	San Gabriel Mountains	246	236	251	275	345
16	North Orange County	221	212	226	249	317
17	Central Orange County	183	167	180	202	245
18	North Coastal Orange County	197	190	202	223	278
19	Saddleback Valley	197	189	201	222	278
20	Central Orange County Coastal	197	190	202	223	278
21	Capistrano Valley	197	189	201	222	278
22	Norco/Corona	270	302	378	486	778
23	Metropolitan Riverside County	270	302	378	488	780
24	Perris Valley	270	302	378	488	780
25	Lake Elsinore	371	416	520	672	1,072
26	Temecula Valley	371	416	520	672	1,072
27	Anza Area	371	416	520	672	1,072
28	Hemet/San Jacinto Valley	371	416	520	672	1,072
29	Banning Airport	236	265	333	434	698
30	Coachella Valley	304	340	425	547	875
31	East Riverside County	304	340	425	547	875
32	Northwest San Bernardino Valley	270	303	378	486	778
33	Southwest San Bernardino Valley	270	303	378	486	778
34	Central San Bernardino Valley	270	302	378	486	778
35	East San Bernardino Valley	270	302	378	486	778
36	West San Bernardino Mountains	270	303	378	486	778
37	Central San Bernardino Mountains	270	302	378	486	778
38	East San Bernardino Mountains	270	302	378	486	778

Table C-2. 2006 – 2008 CO Emission Thresholds for Construction and Operation

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	680	882	1,259	2,406	7,911	1,048	1,368	1,799	3,016	8,637
2	Northwest Coastal LA County	562	833	1,233	2,367	7,724	827	1,213	1,695	2,961	8,446
3	Southwest Coastal LA County	664	785	1,156	2,228	7,269	967	1,158	1,597	2,783	7,950
4	South Coastal LA County	585	789	1,180	2,296	7,558	842	1,158	1,611	2,869	8,253
5	Southeast LA County	571	735	1,088	2,104	6,854	861	1,082	1,496	2,625	7,500
6	West San Fernando Valley	426	652	1,089	2,096	6,815	644	903	1,497	2,629	7,460
7	East San Fernando Valley	498	732	1,158	2,227	7,267	786	1,068	1,594	2,786	7,947
8	West San Gabriel Valley	535	783	1,158	2,229	7,270	812	1,125	1,594	2,785	7,957
9	East San Gabriel Valley	623	945	1,914	4,803	20,721	953	1,344	2,445	5,658	22,093
10	Pomona/Walnut Valley	612	911	1,741	4,345	18,991	885	1,358	2,298	5,097	20,256
11	South San Gabriel Valley	673	760	1,113	2,110	6,884	1,031	1,143	1,554	2,660	7,530
12	South Central LA County	231	342	632	1,545	5,452	346	515	841	1,817	5,962
13	Santa Clarita Valley	590	879	1,294	2,500	8,174	877	1,256	1,787	3,108	8,933
15	San Gabriel Mountains	590	879	1,294	2,500	8,174	877	1,256	1,787	3,108	8,933
16	North Orange County	522	685	1,014	1,975	6,531	762	1,010	1,395	2,444	7,121
17	Central Orange County	485	753	1,128	2,109	6,841	715	1,041	1,547	2,685	7,493
18	North Coastal Orange County	647	738	1,090	2,096	6,841	962	1,089	1,506	2,615	7,493
19	Saddleback Valley	696	833	1,234	2,376	7,724	993	1,227	1,696	2,965	8,454
20	Central Orange County Coastal	647	738	1,090	2,096	6,841	962	1,089	1,506	2,615	7,493
21	Capistrano Valley	696	833	1,234	2,376	7,724	993	1,227	1,696	2,965	8,454
22	Norco/Corona	674	999	1,853	4,352	17,637	1,007	1,474	2,461	5,183	18,934
23	Metropolitan Riverside County	602	887	1,746	4,359	17,640	883	1,262	2,232	5,136	18,947
24	Perris Valley	602	887	1,746	4,359	17,640	883	1,262	2,232	5,136	18,947
25	Lake Elsinore	750	1,105	2,176	5,501	23,866	1,100	1,572	2,781	6,399	25,412
26	Temecula Valley	750	1,105	2,176	5,501	23,866	1,100	1,572	2,781	6,399	25,412
27	Anza Area	750	1,105	2,176	5,501	23,866	1,100	1,572	2,781	6,399	25,412
28	Hemet/San Jacinto Valley	750	1,105	2,176	5,501	23,866	1,100	1,572	2,781	6,399	25,412
29	Banning Airport	1,000	1,420	2,623	6,154	25,057	1,541	2,049	3,458	7,395	26,890
30	Coachella Valley	878	1,387	2,565	6,021	24,417	1,299	1,931	3,409	7,174	26,212
31	East Riverside County	878	1,387	2,565	6,021	24,417	1,299	1,931	3,409	7,174	26,212
32	Northwest San Bernardino Valley	863	1,328	2,423	5,691	23,065	1,232	1,877	3,218	6,778	24,768
33	Southwest San Bernardino Valley	863	1,328	2,423	5,691	23,065	1,232	1,877	3,218	6,778	24,768
34	Central San Bernardino Valley	667	1,059	2,141	5,356	21,708	972	1,463	2,738	6,346	23,304
35	East San Bernardino Valley	775	1,205	2,279	5,351	21,703	1,174	1,712	3,029	6,375	23,294
36	West San Bernardino Mountains	863	1,328	2,423	5,691	23,065	1,232	1,877	3,218	6,778	24,768
37	Central San Bernardino Mountains	667	1,059	2,141	5,356	21,708	972	1,463	2,738	6,346	23,304
38	East San Bernardino Mountains	775	1,205	2,279	5,351	21,703	1,174	1,712	3,029	6,375	23,294

Table C-2. 2006 – 2008 CO Emission Thresholds for Construction and Operation (Continued)

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary				
		5 Acre				
		25	50	100	200	500
1	Central LA	1,861	2,331	3,030	4,547	10,666
2	Northwest Coastal LA County	1,531	1,985	2,762	4,383	10,467
3	Southwest Coastal LA County	1,796	1,984	2,608	4,119	9,852
4	South Coastal LA County	1,530	1,982	2,613	4,184	10,198
5	Southeast LA County	1,480	1,855	2,437	3,867	9,312
6	West San Fernando Valley	1,158	1,537	2,438	3,871	9,271
7	East San Fernando Valley	1,434	1,872	2,599	4,119	9,848
8	West San Gabriel Valley	1,540	1,921	2,599	4,119	9,857
9	East San Gabriel Valley	1,733	2,299	3,680	7,600	25,558
10	Pomona/Walnut Valley	1,566	2,158	3,691	7,011	23,450
11	South San Gabriel Valley	1,814	1,984	2,549	4,024	9,342
12	South Central LA County	630	879	1,368	2,514	7,389
13	Santa Clarita Valley	1,644	2,095	2,922	4,608	11,049
15	San Gabriel Mountains	1,644	2,095	2,922	4,608	11,049
16	North Orange County	1,311	1,731	2,274	3,605	8,754
17	Central Orange County	1,253	1,734	2,498	4,018	9,336
18	North Coastal Orange County	1,711	1,864	2,455	3,888	9,272
19	Saddleback Valley	1,804	2,102	2,763	4,387	10,507
20	Central Orange County Coastal	1,711	1,864	2,455	3,888	9,272
21	Capistrano Valley	1,804	2,102	2,763	4,387	10,507
22	Norco/Corona	1,700	2,470	3,964	7,350	22,490
23	Metropolitan Riverside County	1,577	2,178	3,437	6,860	22,530
24	Perris Valley	1,577	2,178	3,437	6,860	22,530
25	Lake Elsinore	1,965	2,714	4,282	8,547	29,256
26	Temecula Valley	1,965	2,714	4,282	8,547	29,256
27	Anza Area	1,965	2,714	4,282	8,547	29,256
28	Hemet/San Jacinto Valley	1,965	2,714	4,282	8,547	29,256
29	Banning Airport	2,817	3,575	5,534	10,383	31,903
30	Coachella Valley	2,292	3,237	5,331	10,178	31,115
31	East Riverside County	2,292	3,237	5,331	10,178	31,115
32	Northwest San Bernardino Valley	2,193	2,978	5,188	9,611	29,410
33	Southwest San Bernardino Valley	2,193	2,978	5,188	9,611	29,410
34	Central San Bernardino Valley	1,746	2,396	4,142	8,532	27,680
35	East San Bernardino Valley	2,075	2,890	4,765	9,044	27,650
36	West San Bernardino Mountains	2,193	2,978	5,188	9,611	29,410
37	Central San Bernardino Mountains	1,746	2,396	4,142	8,532	27,680
38	East San Bernardino Mountains	2,075	2,890	4,765	9,044	27,650

Table C-3. PM10 Emission Thresholds for Operation

SRA No.	Source Receptor Area	Significance Threshold of 2.5 mg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	2	4	8	17	43	2	6	11	20	46
2	Northwest Coastal LA County	1	3	7	14	36	2	5	9	16	37
3	Southwest Coastal LA County	1	4	7	14	34	2	6	9	16	36
4	South Coastal LA County	1	3	7	15	38	2	5	9	17	40
5	Southeast LA County	1	3	8	16	42	2	5	10	18	44
6	West San Fernando Valley	1	3	7	15	38	2	5	8	16	39
7	East San Fernando Valley	1	3	7	13	33	2	5	9	15	35
8	West San Gabriel Valley	1	3	7	14	37	2	5	9	16	39
9	East San Gabriel Valley	2	4	9	19	48	2	6	11	20	50
10	Pomona/Walnut Valley	1	3	7	14	36	2	5	8	16	38
11	South San Gabriel Valley	1	4	7	15	37	2	6	9	17	39
12	South Central LA County	1	3	7	13	34	2	5	9	15	36
13	Santa Clarita Valley	1	3	6	13	32	2	5	8	15	34
15	San Gabriel Mountains	1	3	6	13	32	2	5	8	15	34
16	North Orange County	1	3	6	13	33	2	4	8	15	35
17	Central Orange County	1	3	7	15	38	2	5	9	17	40
18	North Coastal Orange County	1	4	7	13	33	2	6	9	15	35
19	Saddleback Valley	1	3	6	12	29	2	5	8	14	31
20	Central Orange County Coastal	1	4	7	13	33	2	6	9	15	35
21	Capistrano Valley	1	3	6	12	29	2	5	8	14	31
22	Norco/Corona	1	3	8	18	48	2	5	10	20	50
23	Metropolitan Riverside County	1	3	8	17	43	2	5	10	18	45
24	Perris Valley	1	3	8	17	43	2	5	10	18	45
25	Lake Elsinore	1	3	8	17	43	2	5	10	18	45
26	Temecula Valley	1	3	8	17	43	2	5	10	18	45
27	Anza Area	1	3	8	17	43	2	5	10	18	45
28	Hemet/San Jacinto Valley	1	3	8	17	43	2	5	10	18	45
29	Banning Airport	2	5	14	31	84	3	8	18	38	98
30	Coachella Valley	1	3	9	20	52	2	6	16	36	97
31	East Riverside County	1	3	9	20	52	2	6	16	36	97
32	Northwest San Bernardino Valley	2	4	11	25	68	2	5	9	16	39
33	Southwest San Bernardino Valley	2	4	11	25	68	2	5	9	16	39
34	Central San Bernardino Valley	1	3	8	18	47	2	6	10	20	50
35	East San Bernardino Valley	1	3	9	20	53	2	5	11	22	56
36	West San Bernardino Mountains	2	4	11	25	68	2	5	9	16	39
37	Central San Bernardino Mountains	1	3	8	18	47	2	6	10	20	50
38	East San Bernardino Mountains	1	3	9	20	53	2	5	11	22	56

Table C-3. PM10 Emission Thresholds for Operation (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 2.5 mg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 acres				
		25	50	100	200	500
1	Central LA	4	12	17	26	53
2	Northwest Coastal LA County	3	10	13	21	42
3	Southwest Coastal LA County	4	12	15	21	41
4	South Coastal LA County	4	10	14	22	46
5	Southeast LA County	4	10	15	23	49
6	West San Fernando Valley	3	9	13	21	44
7	East San Fernando Valley	4	11	14	21	41
8	West San Gabriel Valley	3	9	13	21	44
9	East San Gabriel Valley	4	11	16	26	55
10	Pomona/Walnut Valley	3	9	13	20	42
11	South San Gabriel Valley	4	11	15	22	45
12	South Central LA County	4	10	14	20	40
13	Santa Clarita Valley	3	10	13	19	39
15	San Gabriel Mountains	3	10	13	19	39
16	North Orange County	3	9	12	19	40
17	Central Orange County	3	10	14	22	45
18	North Coastal Orange County	4	11	14	21	41
19	Saddleback Valley	3	9	12	18	36
20	Central Orange County Coastal	4	11	14	21	41
21	Capistrano Valley	3	9	12	18	36
22	Norco/Corona	3	9	14	25	55
23	Metropolitan Riverside County	4	10	14	23	50
24	Perris Valley	4	10	14	23	50
25	Lake Elsinore	4	10	14	23	50
26	Temecula Valley	4	10	14	23	50
27	Anza Area	4	10	14	23	50
28	Hemet/San Jacinto Valley	4	10	14	23	50
29	Banning Airport	6	16	25	44	98
30	Coachella Valley	4	11	16	27	60
31	East Riverside County	4	11	16	27	60
32	Northwest San Bernardino Valley	4	12	20	34	78
33	Southwest San Bernardino Valley	4	12	20	34	78
34	Central San Bernardino Valley	4	11	16	26	55
35	East San Bernardino Valley	4	11	16	28	62
36	West San Bernardino Mountains	4	12	20	34	78
37	Central San Bernardino Mountains	4	11	16	26	55
38	East San Bernardino Mountains	4	11	16	28	62

Table C-4. PM10 Emission Thresholds for Construction

SRA No.	Source Receptor Area	Significance Threshold of 10.4 mg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	5	15	33	70	179	8	25	43	80	190
2	Northwest Coastal LA County	4	12	27	57	146	6	19	34	64	154
3	Southwest Coastal LA County	5	14	28	56	140	8	23	37	65	148
4	South Coastal LA County	4	13	29	61	158	7	21	37	70	167
5	Southeast LA County	4	13	30	66	173	7	21	39	74	182
6	West San Fernando Valley	4	11	27	59	155	6	17	33	66	162
7	East San Fernando Valley	4	13	26	54	136	7	21	34	62	144
8	West San Gabriel Valley	4	11	27	58	152	6	19	34	66	160
9	East San Gabriel Valley	5	14	34	75	199	7	22	42	84	207
10	Pomona/Walnut Valley	4	11	26	57	148	6	18	33	64	156
11	South San Gabriel Valley	5	13	29	60	153	7	22	37	68	162
12	South Central LA County	4	12	26	54	139	7	20	34	62	146
13	Santa Clarita Valley	4	12	25	51	131	6	19	32	59	139
15	San Gabriel Mountains	4	12	25	51	131	6	19	32	59	139
16	North Orange County	4	10	24	53	137	6	17	31	60	145
17	Central Orange County	4	12	28	60	158	6	19	35	68	166
18	North Coastal Orange County	4	13	27	54	135	7	21	35	62	144
19	Saddleback Valley	4	11	24	48	121	6	18	30	55	129
20	Central Orange County Coastal	4	13	27	54	135	7	21	35	62	144
21	Capistrano Valley	4	11	24	48	121	6	18	30	55	129
22	Norco/Corona	4	11	32	73	198	6	18	39	81	206
23	Metropolitan Riverside County	4	12	30	67	178	7	20	38	75	186
24	Perris Valley	4	12	30	67	178	7	20	38	75	186
25	Lake Elsinore	4	12	30	67	178	7	20	38	75	186
26	Temecula Valley	4	12	30	67	178	7	20	38	75	186
27	Anza Area	4	12	30	67	178	7	20	38	75	186
28	Hemet/San Jacinto Valley	4	12	30	67	178	7	20	38	75	186
29	Banning Airport	6	19	55	129	348	10	32	73	157	407
30	Coachella Valley	4	13	35	80	214	7	22	44	89	223
31	East Riverside County	4	13	35	80	214	7	22	44	89	223
32	Northwest San Bernardino Valley	5	14	44	103	280	6	19	34	66	160
33	Southwest San Bernardino Valley	5	14	44	103	280	6	19	34	66	160
34	Central San Bernardino Valley	4	13	33	74	196	7	22	42	83	205
35	East San Bernardino Valley	4	12	36	82	220	7	21	44	90	230
36	West San Bernardino Mountains	5	14	44	103	280	6	19	34	66	160
37	Central San Bernardino Mountains	4	13	33	74	196	7	22	42	83	205
38	East San Bernardino Mountains	4	12	36	82	220	7	21	44	90	230

Table C-4. PM10 Emission Thresholds for Construction (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 10.4 mg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 acres				
		25	50	100	200	500
1	Central LA	16	50	69	107	219
2	Northwest Coastal LA County	13	40	55	84	174
3	Southwest Coastal LA County	15	46	60	88	171
4	South Coastal LA County	14	42	58	92	191
5	Southeast LA County	14	42	60	95	203
6	West San Fernando Valley	11	35	51	84	181
7	East San Fernando Valley	14	42	56	84	167
8	West San Gabriel Valley	12	37	53	85	180
9	East San Gabriel Valley	14	43	63	105	229
10	Pomona/Walnut Valley	12	36	51	82	175
11	South San Gabriel Valley	14	43	59	91	186
12	South Central LA County	13	41	55	83	166
13	Santa Clarita Valley	12	38	52	79	161
15	San Gabriel Mountains	12	38	52	79	161
16	North Orange County	11	34	49	78	165
17	Central Orange County	13	39	55	88	188
18	North Coastal Orange County	14	44	57	85	167
19	Saddleback Valley	12	37	49	74	148
20	Central Orange County Coastal	14	44	57	85	167
21	Capistrano Valley	12	37	49	74	148
22	Norco/Corona	12	37	58	101	228
23	Metropolitan Riverside County	13	40	59	96	207
24	Perris Valley	13	40	59	96	207
25	Lake Elsinore	13	40	59	96	207
26	Temecula Valley	13	40	59	96	207
27	Anza Area	13	40	59	96	207
28	Hemet/San Jacinto Valley	13	40	59	96	207
29	Banning Airport	21	67	104	180	405
30	Coachella Valley	14	44	67	112	248
31	East Riverside County	14	44	67	112	248
32	Northwest San Bernardino Valley	16	50	80	140	322
33	Southwest San Bernardino Valley	16	50	80	140	322
34	Central San Bernardino Valley	14	44	65	106	229
35	East San Bernardino Valley	14	42	66	113	255
36	West San Bernardino Mountains	16	50	80	140	322
37	Central San Bernardino Mountains	14	44	65	106	229
38	East San Bernardino Mountains	14	42	66	113	255

Table C-5. PM2.5 Emission Thresholds for Operation

SRA No.	Source Receptor Area	Significance Threshold of 2.5 ug/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	1	2	3	6	25	2	2	3	7	27
2	Northwest Coastal LA County	1	1	2	5	19	1	2	3	6	20
3	Southwest Coastal LA County	1	2	3	5	18	1	2	3	6	20
4	South Coastal LA County	1	2	3	7	23	1	2	4	8	25
5	Southeast LA County	1	1	2	5	21	1	2	3	6	22
6	West San Fernando Valley	1	1	2	5	19	1	2	2	5	21
7	East San Fernando Valley	1	1	2	5	17	1	2	3	5	18
8	West San Gabriel Valley	1	1	2	5	19	1	2	3	5	20
9	East San Gabriel Valley	1	2	3	6	23	2	2	3	7	25
10	Pomona/Walnut Valley	1	1	2	5	18	1	2	3	5	20
11	South San Gabriel Valley	1	2	3	5	20	2	2	3	6	22
12	South Central LA County	1	1	2	4	17	1	2	3	5	18
13	Santa Clarita Valley	1	1	2	5	18	1	2	2	5	20
15	San Gabriel Mountains	1	1	2	5	18	1	2	2	5	20
16	North Orange County	1	1	3	5	18	1	2	3	6	19
17	Central Orange County	1	1	2	6	21	1	2	3	6	22
18	North Coastal Orange County	1	2	3	6	19	2	2	3	7	20
19	Saddleback Valley	1	1	2	5	17	1	2	3	6	18
20	Central Orange County Coastal	1	2	3	6	19	2	2	3	7	20
21	Capistrano Valley	1	1	2	5	17	1	2	3	6	18
22	Norco/Corona	1	2	3	6	23	2	2	3	6	24
23	Metropolitan Riverside County	1	1	2	5	21	1	2	3	6	22
24	Perris Valley	1	1	2	5	21	1	2	3	6	22
25	Lake Elsinore	1	1	2	5	21	1	2	3	6	22
26	Temecula Valley	1	1	2	5	21	1	2	3	6	22
27	Anza Area	1	1	2	5	21	1	2	3	6	22
28	Hemet/San Jacinto Valley	1	1	2	5	21	1	2	3	6	22
29	Banning Airport	1	2	4	9	38	2	3	5	10	40
30	Coachella Valley	1	2	3	6	26	2	2	3	7	27
31	East Riverside County	1	2	3	6	26	2	2	3	7	27
32	Northwest San Bernardino Valley	1	2	3	8	34	2	2	4	9	36
33	Southwest San Bernardino Valley	1	2	3	8	34	2	2	4	9	36
34	Central San Bernardino Valley	1	2	3	6	24	1	2	3	7	25
35	East San Bernardino Valley	1	2	3	7	27	2	2	4	8	29
36	West San Bernardino Mountains	1	2	3	8	34	2	2	4	9	36
37	Central San Bernardino Mountains	1	2	3	6	24	1	2	3	7	25
38	East San Bernardino Mountains	1	2	3	7	27	2	2	4	8	29

Table C-5. PM2.5 Emission Thresholds for Operation (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 2.5 ug/m3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 Acre				
		25	50	100	200	500
1	Central LA	2	3	5	9	31
2	Northwest Coastal LA County	2	2	4	7	23
3	Southwest Coastal LA County	2	3	5	9	24
4	South Coastal LA County	2	3	5	10	29
5	Southeast LA County	2	3	4	8	25
6	West San Fernando Valley	2	2	3	7	23
7	East San Fernando Valley	2	3	4	7	21
8	West San Gabriel Valley	2	3	4	7	23
9	East San Gabriel Valley	2	3	5	9	28
10	Pomona/Walnut Valley	2	3	4	7	23
11	South San Gabriel Valley	2	3	5	9	25
12	South Central LA County	2	3	4	7	21
13	Santa Clarita Valley	2	2	3	7	23
15	San Gabriel Mountains	2	2	3	7	23
16	North Orange County	2	3	4	8	23
17	Central Orange County	2	3	4	8	27
18	North Coastal Orange County	2	3	5	9	25
19	Saddleback Valley	2	3	4	8	22
20	Central Orange County Coastal	2	3	5	9	25
21	Capistrano Valley	2	3	4	8	22
22	Norco/Corona	2	3	5	9	28
23	Metropolitan Riverside County	2	3	4	8	26
24	Perris Valley	2	3	4	8	26
25	Lake Elsinore	2	3	4	8	26
26	Temecula Valley	2	3	4	8	26
27	Anza Area	2	3	4	8	26
28	Hemet/San Jacinto Valley	2	3	4	8	26
29	Banning Airport	3	4	6	14	46
30	Coachella Valley	2	3	5	9	31
31	East Riverside County	2	3	5	9	31
32	Northwest San Bernardino Valley	2	3	5	11	41
33	Southwest San Bernardino Valley	2	3	5	11	41
34	Central San Bernardino Valley	2	3	5	9	29
35	East San Bernardino Valley	3	3	5	10	34
36	West San Bernardino Mountains	2	3	5	11	41
37	Central San Bernardino Mountains	2	3	5	9	29
38	East San Bernardino Mountains	3	3	5	10	34

Table C-6. PM2.5 Emission Thresholds for Construction

SRA No.	Source Receptor Area	Significance Threshold of 10.4 ug/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	3	5	10	24	102	5	7	12	28	110
2	Northwest Coastal LA County	3	4	8	18	77	4	5	10	21	82
3	Southwest Coastal LA County	3	5	9	21	75	5	7	12	25	81
4	South Coastal LA County	3	5	10	26	93	5	7	13	30	101
5	Southeast LA County	3	4	8	19	86	4	6	10	22	92
6	West San Fernando Valley	3	4	7	18	79	4	5	9	21	84
7	East San Fernando Valley	3	4	8	18	68	4	6	10	21	73
8	West San Gabriel Valley	3	4	7	18	77	4	5	9	21	82
9	East San Gabriel Valley	3	5	9	22	94	5	7	12	26	100
10	Pomona/Walnut Valley	3	4	7	18	75	4	6	10	21	80
11	South San Gabriel Valley	4	5	9	20	83	5	8	12	24	89
12	South Central LA County	3	4	7	17	70	4	6	9	19	74
13	Santa Clarita Valley	3	4	7	18	74	4	5	9	20	80
15	San Gabriel Mountains	3	4	7	18	74	4	5	9	20	80
16	North Orange County	3	4	9	20	74	4	6	11	24	79
17	Central Orange County	3	4	9	22	85	4	6	11	25	92
18	North Coastal Orange County	3	5	9	22	76	5	7	12	26	83
19	Saddleback Valley	3	4	8	19	68	4	6	10	22	74
20	Central Orange County Coastal	3	5	9	22	76	5	7	12	26	83
21	Capistrano Valley	3	4	8	19	68	4	6	10	22	74
22	Norco/Corona	3	5	9	22	92	5	7	12	25	98
23	Metropolitan Riverside County	3	4	8	20	86	4	6	10	23	91
24	Perris Valley	3	4	8	20	86	4	6	10	23	91
25	Lake Elsinore	3	4	8	20	86	4	6	10	23	91
26	Temecula Valley	3	4	8	20	86	4	6	10	23	91
27	Anza Area	3	4	8	20	86	4	6	10	23	91
28	Hemet/San Jacinto Valley	3	4	8	20	86	4	6	10	23	91
29	Banning Airport	4	7	14	36	156	6	9	17	41	166
30	Coachella Valley	3	5	10	24	105	5	7	12	28	112
31	East Riverside County	3	5	10	24	105	5	7	12	28	112
32	Northwest San Bernardino Valley	4	6	12	32	141	5	8	14	36	150
33	Southwest San Bernardino Valley	4	6	12	32	141	5	8	14	36	150
34	Central San Bernardino Valley	3	5	9	23	98	4	6	12	26	104
35	East San Bernardino Valley	4	5	10	26	112	5	7	13	30	120
36	West San Bernardino Mountains	4	6	12	32	141	5	8	14	36	150
37	Central San Bernardino Mountains	3	5	9	23	98	4	6	12	26	104
38	East San Bernardino Mountains	4	5	10	26	112	5	7	13	30	120

Table C-6. PM2.5 Emission Thresholds for Construction (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 10.4 ug/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 Acre				
		25	50	100	200	500
1	Central LA	8	11	18	36	126
2	Northwest Coastal LA County	6	8	14	29	95
3	Southwest Coastal LA County	8	11	19	35	96
4	South Coastal LA County	8	10	18	39	120
5	Southeast LA County	7	10	15	30	103
6	West San Fernando Valley	6	8	13	26	96
7	East San Fernando Valley	8	10	15	28	86
8	West San Gabriel Valley	7	9	14	27	93
9	East San Gabriel Valley	8	11	17	35	116
10	Pomona/Walnut Valley	7	9	15	28	93
11	South San Gabriel Valley	9	12	19	34	104
12	South Central LA County	7	10	15	27	86
13	Santa Clarita Valley	6	8	13	26	95
15	San Gabriel Mountains	6	8	13	26	95
16	North Orange County	6	9	15	34	95
17	Central Orange County	7	9	15	32	109
18	North Coastal Orange County	9	11	18	35	101
19	Saddleback Valley	8	11	16	30	90
20	Central Orange County Coastal	9	11	18	35	101
21	Capistrano Valley	8	11	16	30	90
22	Norco/Corona	8	11	18	34	113
23	Metropolitan Riverside County	8	10	16	31	105
24	Perris Valley	8	10	16	31	105
25	Lake Elsinore	8	10	16	31	105
26	Temecula Valley	8	10	16	31	105
27	Anza Area	8	10	16	31	105
28	Hemet/San Jacinto Valley	8	10	16	31	105
29	Banning Airport	11	14	25	55	189
30	Coachella Valley	8	11	19	37	128
31	East Riverside County	8	11	19	37	128
32	Northwest San Bernardino Valley	9	12	21	45	170
33	Southwest San Bernardino Valley	9	12	21	45	170
34	Central San Bernardino Valley	8	10	17	35	120
35	East San Bernardino Valley	9	12	20	40	140
36	West San Bernardino Mountains	9	12	21	45	170
37	Central San Bernardino Mountains	8	10	17	35	120
38	East San Bernardino Mountains	9	12	20	40	140

Exhibit F-1

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A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher

Chapter 10 of
Section A, Biological Science
Book 2, Collection of Environmental Data

Techniques and Methods 2A-10

U.S. Department of the Interior
U.S. Geological Survey

Cover: Southwestern Willow Flycatcher. Photograph taken by Susan Sferra, U.S. Fish and Wildlife Service.

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Techniques and Methods 2A-10

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U.S. Geological Survey, Reston, Virginia: 2010

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Conversion Factors

Multiply	By	To obtain
centimeter (cm)	0.3937	inch (in.)
gram (g)	0.03527	ounce, avoirdupois (oz)
hectare (ha)	2.471	acre
kilometer (km)	0.6214	mile (mi)
meter (m)	3.281	foot (ft)
millimeter (mm)	0.03937	inch (in.)

Abbreviations and Acronyms

GPS	Global Positioning System
NDVI	Normalized Difference Vegetation Index
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher

By Mark K. Sogge, U.S. Geological Survey; Darrell Ahlers, Bureau of Reclamation; and Susan J. Sferra, U.S. Fish and Wildlife Service

Background

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*) has been the subject of substantial research, monitoring, and management activity since it was listed as an endangered species in 1995. When proposed for listing in 1993, relatively little was known about the flycatcher's natural history, and there were only 30 known breeding sites supporting an estimated 111 territories rangewide (Sogge and others, 2003a). Since that time, thousands of presence/absences surveys have been conducted throughout the historical range of the flycatcher, and many studies of its natural history and ecology have been completed. As a result, the ecology of the flycatcher is much better understood than it was just over a decade ago. In addition, we have learned that the current status of the flycatcher is better than originally thought: as of 2007, the population was estimated at approximately 1,300 territories distributed among approximately 280 breeding sites (Durst and others, 2008a).

Concern about the Southwestern Willow Flycatcher on a rangewide scale was brought to focus by Unitt (1987), who described declines in flycatcher abundance and distribution throughout the Southwest. *E. t. extimus* populations declined during the 20th century, primarily because of habitat loss and modification from activities, such as dam construction and operation, groundwater pumping, water diversions, and flood control. In 1991, the U.S. Fish and Wildlife Service (USFWS) designated the Southwestern Willow Flycatcher as a candidate category 1 species (U.S. Fish and Wildlife Service, 1991). In July 1993, the USFWS proposed to list *E. t. extimus* as an endangered species and to designate critical habitat under the Act (U.S. Fish and Wildlife Service, 1993). A final rule listing *E. t. extimus* as endangered was published in February 1995 (U.S. Fish and Wildlife Service, 1995); critical habitat was designated in 1997 (U.S. Fish and Wildlife Service, 1997). The USFWS Service released a Recovery Plan for the Southwestern Willow Flycatcher in 2002 (U.S. Fish and Wildlife Service, 2002), and re-designated critical habitat in 2005 (U.S. Fish and Wildlife Service, 2005).

In addition to its federal status, the Southwestern Willow Flycatcher is listed as an endangered species or species of concern in Arizona (Arizona Game and Fish Department, 2006), New Mexico (New Mexico Department of Game and Fish, 1996), California (California Department of Fish and Game, 1991), and Utah (Utah Division of Wildlife Resources, 1997).

Sound management and conservation of an endangered species like the Southwestern Willow Flycatcher requires current, detailed information on its abundance and distribution. This requires, among other things, identifying where flycatchers are and are not breeding, and annual monitoring of as many breeding areas as possible. Such efforts require effective, standardized survey protocols and consistent reporting, at both local and regional levels. However, the Willow Flycatcher is a difficult species to identify and survey for. Moreover, inconsistent or ineffective surveys are of limited value, can produce misleading information (including "false positives" and "false negatives"), hinder regional and rangewide analyses, and waste limited resources.

We developed this document to provide a standardized survey protocol and a source of basic ecological and status information on the flycatcher. The first section summarizes the current state of knowledge regarding Southwestern Willow Flycatcher natural history, based on a wide array of published and unpublished literature. Emphasis is given to information relevant to flycatcher conservation and management, and to conducting and interpreting surveys. The second section details a standard survey protocol that provides for consistent data collection, reporting, and interpretation. This protocol document builds on and supersedes previous versions, the most recent of which was Sogge and others (1997a). In this update, we incorporate over a decade of new science and survey results, and refine the survey methodology to clarify key points. Further, we update the standard survey data sheets and provide guidelines on how to fill in the requested information. Amidst these revisions, the basic approach of the survey protocol has remained unchanged—multiple surveys at each survey area within the same breeding season, the use of the call-playback technique using flycatcher vocalizations to increase the probability of detection, and verification of species identity through its diagnostic song.

Section 1. Natural History

Breeding Range and Taxonomy

The Willow Flycatcher is a widespread species that breeds across much of the conterminous United States (Sedgwick, 2000). Four subspecies commonly are recognized in North America, with each occupying a distinct breeding range (fig. 1): *E. t. adastus*, ranging across the northern Rocky Mountains and Great Basin; *E. t. brewsteri*, found west of the Sierra Nevada and Cascade Mountains along the Pacific Slope; *E. t. extimus*, the Southwestern Willow Flycatcher, which breeds across the Southwest; and *E. t. traillii*, ranging east of the northern Rocky Mountains. Although the overall subspecies' ranges are distinct, Sedgwick (2001) and Paxton (2008) noted interbreeding/gradation zones in the boundary area between *E. t. extimus* and *E. t. adastus*.

The breeding range of the Southwestern Willow Flycatcher includes southern California, Arizona, New Mexico, southwestern Colorado, and extreme southern portions of Nevada and Utah: specific range boundaries are delineated in the subspecies' recovery plan (U.S. Fish and Wildlife Service, 2002). Unitt (1987) included western Texas in the subspecies' range, but recent breeding records from western Texas are lacking. Records of probable breeding Southwestern Willow Flycatchers in Mexico are few and restricted to extreme northern Baja California and Sonora (Unitt, 1987; Wilbur, 1987). Although recent data are lacking, the USFWS does include parts of northern Mexico in its description of *E. t. extimus* breeding range (U.S. Fish and Wildlife Service, 2002).

Although they appear very similar to most observers, experienced taxonomist or those using specialized equipment (for example, an electronic colorimeter) can differentiate among the subspecies by subtle differences in color and morphology (for example, Unitt, 1987; Paxton, 2008). Despite the subtle level of differences, the taxonomic status of *E. t. extimus* has been critically reviewed and confirmed multiple times based on morphological, genetic, and song data (Hubbard, 1987; Unitt, 1987; Browning, 1993; Paxton, 2000; Sedgwick, 2001).

The Southwestern Willow Flycatcher was described by Phillips (1948) from a specimen collected along the San Pedro River in southeastern Arizona. The Southwestern Willow Flycatcher generally is paler than other Willow Flycatcher subspecies, although this difference is indistinguishable without considerable experience and training, and study skins as comparative reference material. The southwestern subspecies differs in morphology (primarily wing formula) but not overall size. The plumage and color differences between the Willow Flycatcher subspecies are so subtle that they should not be used to characterize birds observed in the field (Unitt, 1987; Hubbard, 1999; U.S. Fish and Wildlife Service, 2002).

Migration and Winter Range, Habitat, and Ecology

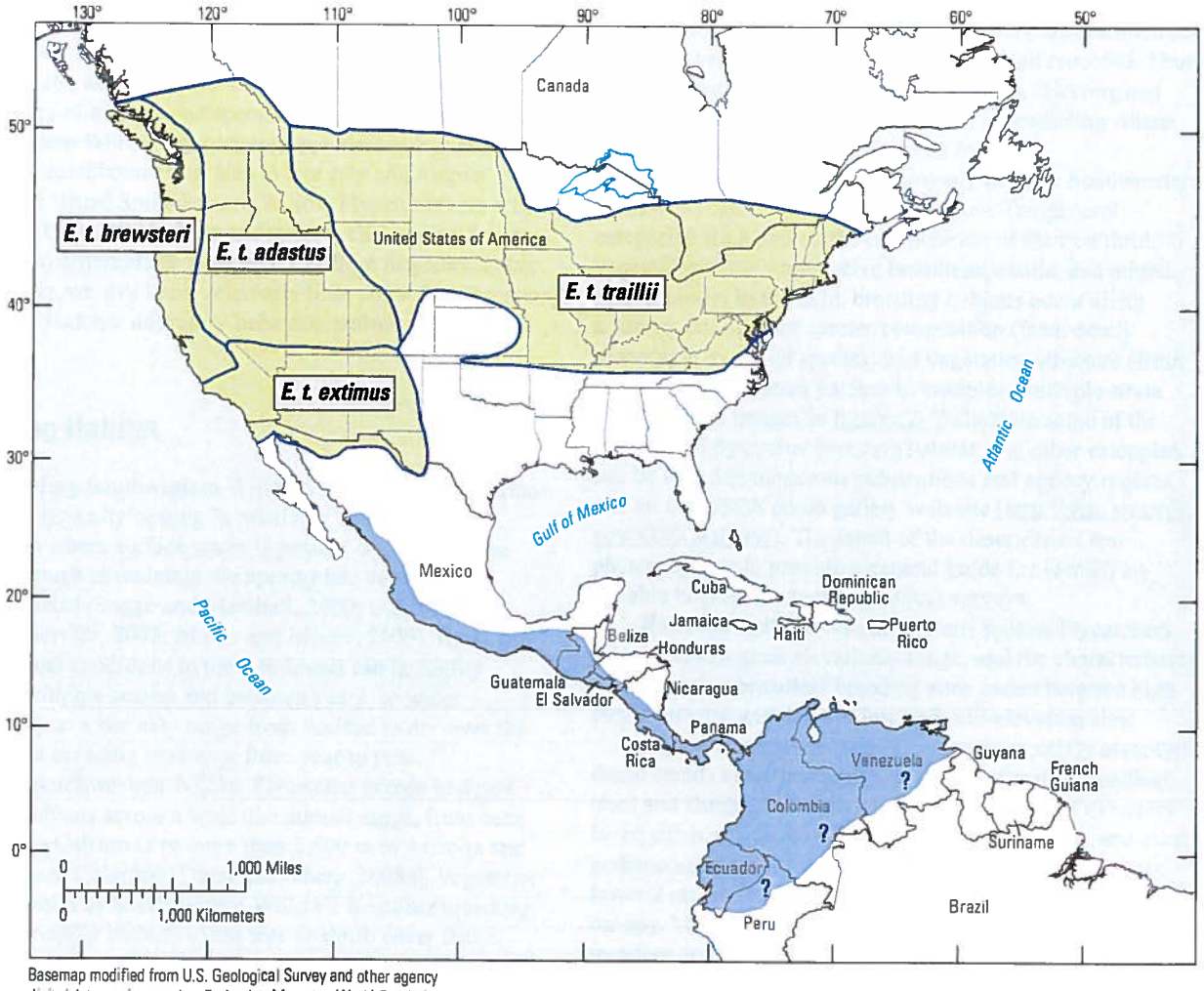
All Willow Flycatcher subspecies breed in North America but winter in the subtropical and tropical regions of southern Mexico, Central America, and northern South America (Sedgwick, 2000; Koronkiewicz, 2002; fig. 1). Most wintering birds are found in the Pacific slope lowlands in Mexico and Central America, and Caribbean slope lowlands in Mexico and Guatemala.

Because all Willow Flycatcher subspecies look very similar, determining specific wintering sites for the southwestern race has been challenging. However, recent genetic analysis of wintering birds (Paxton, 2008) suggests that the four subspecies occupy finite areas of the wintering grounds, but with overlapping ranges. The Southwestern Willow Flycatcher appears to be largely restricted to the center of the winter range (in the vicinity of Costa Rica), although Paxton (2008) suggests more research is needed to address this question.

On the wintering grounds, flycatchers primarily are found in habitats that have four main components: (1) standing or slow moving water and/or saturated soils, (2) patches or stringers of trees, (3) woody shrubs, and (4) open areas (Koronkiewicz and Whitfield, 1999; Koronkiewicz and Sogge, 2000; Lynn and others, 2003; Nishida and Whitfield, 2007; Schuetz and others, 2007). Based on surveys to date, the presence of water or saturated soils is almost universal, although tree heights and configurations, the presence of woody shrubs, and the amount of open space surrounding winter territories can vary considerably (Schuetz and others, 2007).

Male and female flycatchers hold separate, individual non-breeding territories, and defend those territories throughout the winter by using song, calls, and aggression displays. Fidelity to wintering territories and sites is high, as is survivorship over the wintering period (Koronkiewicz and others, 2006b; Sogge and others, 2007).

Willow Flycatchers travel approximately 1,500–8,000 km each way between wintering and breeding areas. During migration, flycatchers use a wider array of forest and shrub habitats than they do for breeding, although riparian vegetation may still be a preferred migration habitat type (Finch and others, 2000). Migration requires high energy expenditures, exposure to predators, and successful foraging in unfamiliar areas. Therefore, migration is the period of highest mortality within the annual cycle of the flycatcher (Paxton and others, 2007). Willow Flycatchers of all subspecies sing during northward migration, perhaps to establish temporary territories for short-term defense of food resources.



Basemap modified from U.S. Geological Survey and other agency digital data, various scales. Projection Mercator, World Geodetic System1984 datum.

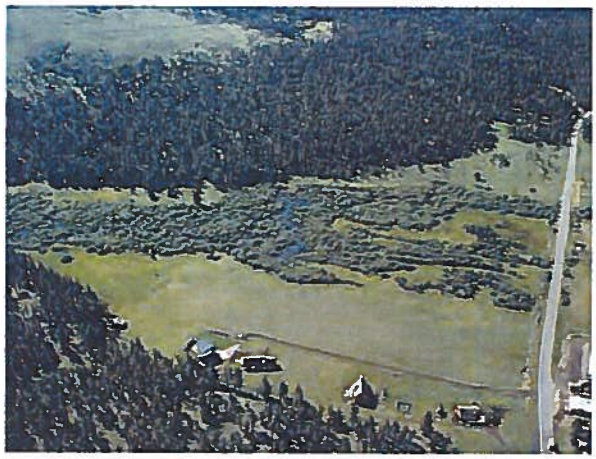
EXPLANATION

Approximate range distribution of the Willow Flycatcher (*Empidonax traillii*)—Adapted from Unitt (1987), Browning (1993), and Paxton (2008)

Breeding range, including boundaries of the Willow Flycatcher subspecies

? Wintering range—Question marks reflect uncertainty of the location of the eastern boundary of the winter range

Figure 1. Approximate ranges of the Willow Flycatcher (*Empidonax traillii*) during breeding and non-breeding seasons.

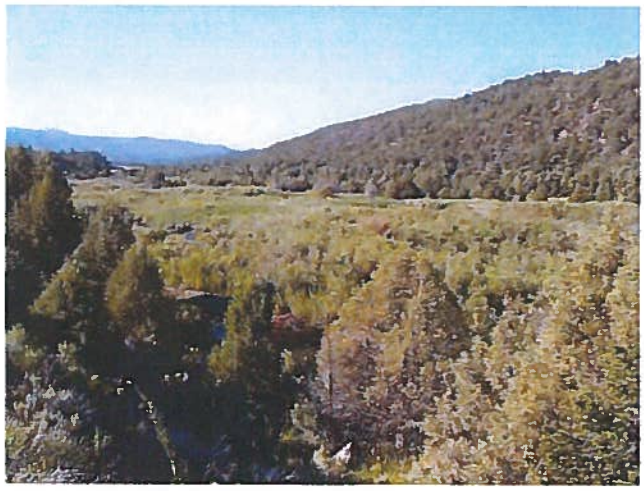


Aerial view of Little Colorado River near Greer, Arizona. Photograph by USGS, 1995.

Little Colorado River near Greer, Arizona. Photograph courtesy of Arizona Game and Fish Department, 1996.

Parkview Fish Hatchery, New Mexico. Photograph by USGS, 2000.

Rio Grande State Wildlife Area, Colorado. Photograph by USGS, 2002.



Tierra Azul, New Mexico. Photograph by USGS, 2005.

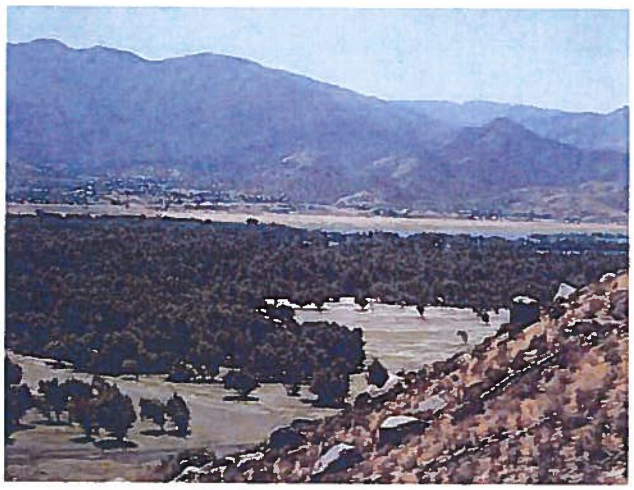
McIntyre Springs, Colorado. Photograph by USGS, 2002.

Figure 2. Examples of Southwestern Willow Flycatcher breeding habitat in native broadleaf vegetation at high-elevation sites.

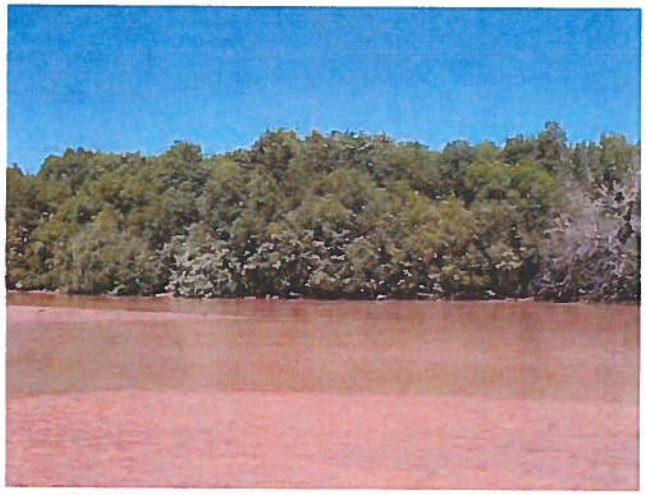
Hassayampa River, Arizona. Photograph by USGS, 2003.

Santa Ynez River, California, Photograph by USGS, 1996.

San Luis Rey River, California. Photograph by USGS, 2005.



Kern River, California. Photograph by USGS, 1995.



Bosque del Apache, Rio Grande, New Mexico. Photograph courtesy of Bureau of Reclamation, 2008.

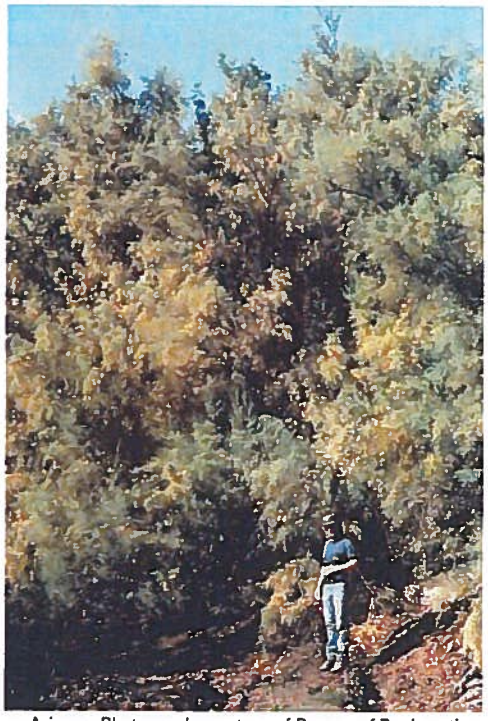
Kern River, California. Photograph by USGS, 1995.

Figure 3. Examples of Southwestern Willow Flycatcher breeding habitat in native broadleaf vegetation at low and mid-elevation sites.

Aerial view of Topock Marsh, Colorado River, Arizona. Photograph by USGS, 1996.

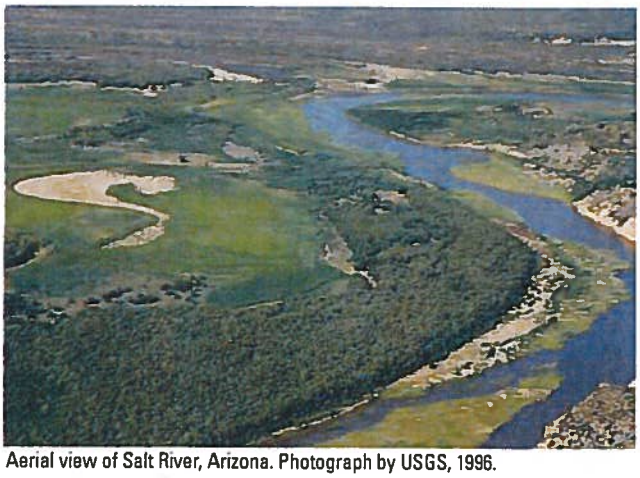
Topock Marsh, Colorado River, Arizona. Photograph by USGS, 1996.

Rio Grande, New Mexico. Photograph by USGS, 2005.



Salt River, Arizona. Photograph courtesy of Bureau of Reclamation, 1996.

Orrilla Verde, Rio Grande, New Mexico. Photograph by USGS, 2006.



Aerial view of Salt River, Arizona. Photograph by USGS, 1996.

Figure 4. Examples of Southwestern Willow Flycatcher breeding habitat in exotic vegetation.

Mixed native/exotic—(fig. 5) These sites include dense mixtures of native broadleaf trees and shrubs (such as those listed above) mixed with exotic/introduced species, such as saltcedar or Russian olive; exotics are often primarily in the understory, but may be a component of overstory; the native and exotic components may be dispersed throughout the habitat or concentrated as a distinct patch within a larger matrix of habitat; overall, a particular site may be dominated primarily by natives or exotics, or be a more-or-less equal mixture.

Regardless of the plant species composition or height, occupied sites almost always have dense vegetation in the patch interior (fig. 6). These dense patches are often interspersed with small openings, open water, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense.

Gila River, Arizona. Photograph by USGS, 2002.

Roosevelt Lake, Arizona. Photograph by USGS, 1999.

Verde River River, Arizona. Photograph by USGS, 2002.

Virgin River, Utah. Photograph by USGS, 1997.

Figure 5. Examples of Southwestern Willow Flycatcher breeding habitat in mixed native/exotic vegetation.

Gila River, Arizona. Photograph by USGS, 2002.

Kern River, California. Photograph by USGS, 1999.

Rio Grande, New Mexico. Photograph by USGS, 2007.

Salt River, Arizona. Photograph by USGS, 1999.

Rio Grande, New Mexico. Photograph by USGS, 2007.

Rio Grande, New Mexico. Photograph by USGS, 2005.

Figure 6. Examples of dense vegetation structure within breeding habitats of Southwestern Willow Flycatcher.

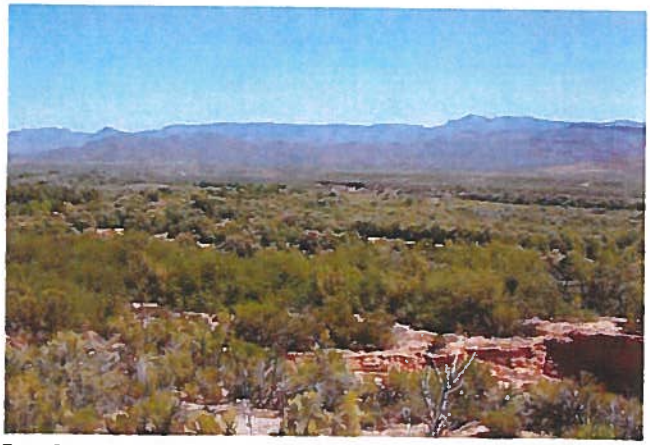
Riparian patches used by breeding flycatchers vary in size and shape, ranging from a relatively contiguous stand of uniform vegetation to an irregularly shaped mosaic of dense vegetation with open areas. Southwestern Willow Flycatchers have nested in patches as small as 0.8 ha (for example, in the Grand Canyon) and as large as several hundred hectares (for example, at Roosevelt Lake, Ariz., or Elephant Butte Reservoir, New Mex.). They have only rarely been found nesting in isolated, narrow, linear riparian habitats that are less than 10 m wide, although they will use such linear habitats during migration.

Flycatcher territories and nests typically are adjacent to open water, cienegas, marshy seeps, or saturated soil, and within riparian areas rooted in standing water. However, in the Southwest, hydrological conditions at a site can vary remarkably within a season, between years, and among nearby sites (fig. 7). Surface water or saturated soil may only be present early in the breeding season (that is, May and part of June), especially in dry years. Similarly, vegetation at a patch may be immersed in standing water during a wet year, but be hundreds of meters from surface water in dry years (Ahlers and Moore, 2009). This is particularly true of reservoir sites, such as the Kern River at Lake Isabella, Calif., Tonto Creek and Salt River at Roosevelt Lake, and the Rio Grande near Elephant Butte Reservoir. Natural or human-caused river channel modifications and altered subsurface flows (for example, from agricultural runoff), can lead to a total absence of water or visibly saturated soil at a site for several years.

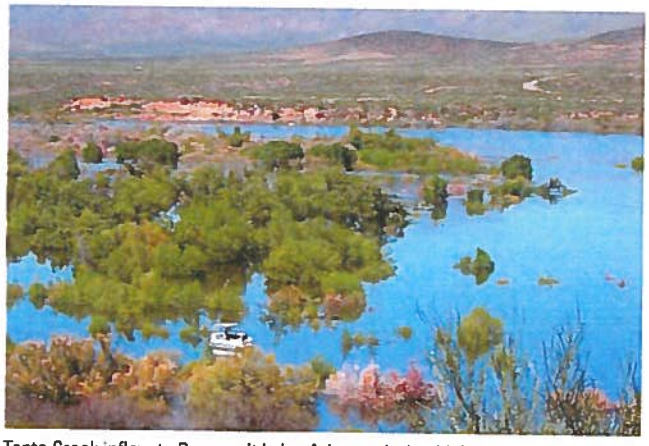
Other potentially important aspects of Southwestern Willow Flycatcher habitat include distribution and isolation of vegetation patches, hydrology, food base (arthropods), parasites, predators, environmental factors (for example temperature, humidity), and interspecific competition (U.S. Fish and Wildlife Service, 2002). Population dynamics

Rio Grande at San Marcial, New Mexico, with dry substrate. Photograph by USGS, 2007.

Rio Grande at San Marcial, New Mexico, with flowing water beneath the territories. Photograph by USGS, 2007.



Tonto Creek inflow to Roosevelt Lake, Arizona, during a dry year. Photograph by USGS, 2004.



Tonto Creek inflow to Roosevelt Lake, Arizona, during high-water year. Photograph by USGS, 2005.

Figure 7. Examples of the variable hydrologic conditions at breeding habitats of Southwestern Willow Flycatcher.

factors, such as demography (for example, survivorship rates, fecundity), distribution of breeding groups across the landscape, flycatcher dispersal patterns, migration routes, the tendency for adults and surviving young to return to their previous year breeding site, and conspecific sociality also influence where flycatchers are found and what habitats they use (U.S. Fish and Wildlife Service, 2002).

It is critically important to recognize that the ultimate measure of habitat suitability is not simply whether or not a site is occupied. Habitat suitability occurs along a gradient from high to poor to unsuitable; the best habitats are those in which flycatcher reproductive success and survivorship result in a stable or growing population. Some occupied habitats may be acting as population sources, while others may be functioning as population sinks (Pulliam, 1988). Therefore, it can take extensive research to determine the quality of any given habitat patch. Furthermore, productivity and survival rates can vary widely among years (Paxton and others, 2007; Ellis and others, 2008; Ahlers and Moore, 2009), so conclusions based on short-term datasets or data extrapolated from one area to another may be erroneous. It also is important to note that not all unoccupied habitat is unsuitable; some sites with suitable habitat may be geographically isolated or newly established, such that they are not yet colonized by breeding flycatchers. There also may simply not be enough flycatchers in a given area to fill all available habitat in particular locations (U.S. Fish and Wildlife Service, 2002). A better understanding of which habitats or sites are sinks or sources can be especially helpful in site conservation and restoration planning.

As described earlier, migrant Willow Flycatchers may occur in riparian habitats that are structurally unsuitable for breeding (for example, too sparse, smaller patch size, etc.), and in non-riparian habitats. Such migration stopover areas, even though not used for breeding, may be critically important resources affecting local and regional flycatcher productivity and survival (U.S. Fish and Wildlife Service, 2002, 2005).

Breeding Chronology and Biology

Unless otherwise noted, the information that follows and upon which the generalized breeding season chronology (fig. 8) is based comes from Unitt (1987), Whitfield (1990), Maynard (1995), Sogge and others (2003b), Paxton and others (2007), Schuetz and Whitfield (2007), and Ellis and others (2008). Extreme or record dates for any stage of the breeding cycle may vary by 1–2 weeks from the dates presented, depending on the geographic area, extreme weather events, yearly variation and other factors. Higher elevation areas, in particular, have delayed chronology (Ahlers and White, 2000).

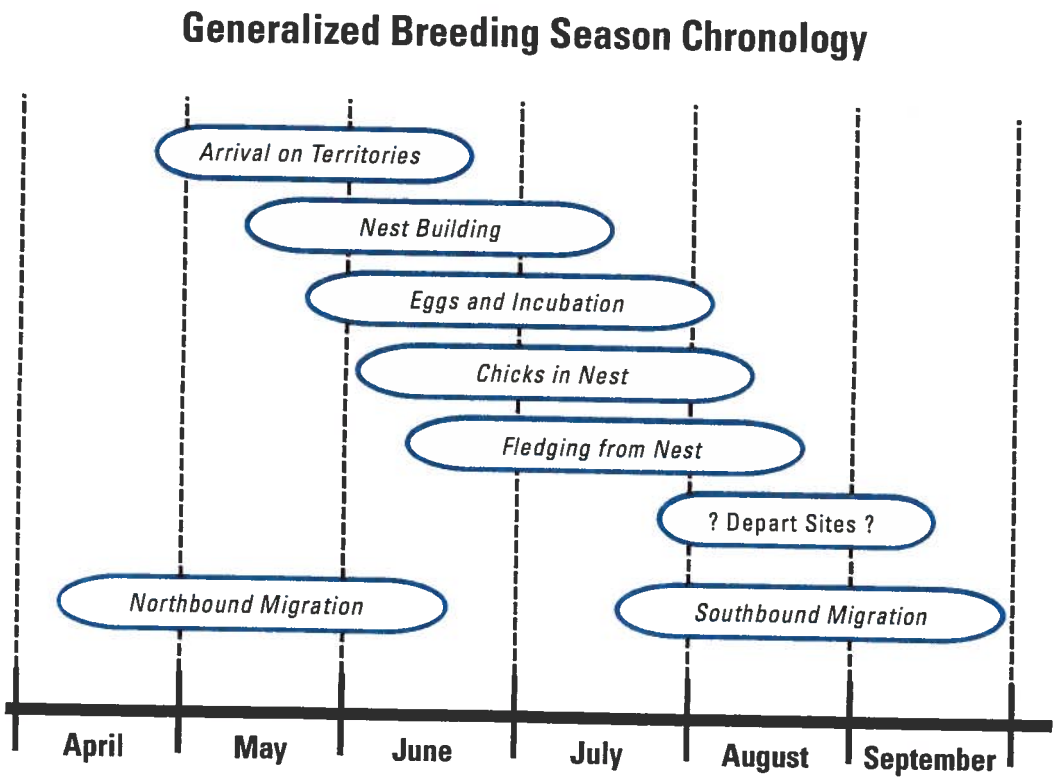


Figure 8. Generalized migration and breeding chronology for the Willow Flycatcher in the Southwest. Extreme or record dates may occur slightly earlier or later than indicated.

Both sexes can breed beginning in their second year. Male Southwestern Willow Flycatchers generally arrive at breeding areas first; older males typically arrive before younger ones. Although females usually arrive a few weeks after males, some older females are present at sites before late-arriving males. Adult flycatchers will sometimes wander extensively through large riparian sites before and after breeding, possibly as a way to evaluate potential breeding habitat (Cardinal and others, 2006).

Males establish and defend their territories through singing and aggressive interactions. Females settle on established territories, and may choose a territory more for its habitat characteristics than for the traits of its territorial male. Territory size tends to be larger when a male first arrives, then gets smaller after a female pairs with the male (Cardinal and others, 2006). Similarly, male song rate is very high early in the season, then declines after pairing (Yard and Brown, 2003). Not all males are successful in attracting mates in a given year, and as a result unpaired territorial males occur at many breeding sites. Unpaired males are usually a small percentage of any local population, but can comprise as much as 15–25 percent of the territories in some populations (Munzer and others, 2005; Ahlers and Moore, 2009).

Although the Willow Flycatcher as a species is considered predominantly monogamous during the breeding season (Sedgwick, 2000), some Southwestern Willow Flycatcher populations have a relatively high degree of polygyny whereby one male can have more than one breeding female in its territory. Polygynous males generally have two females in their territory, but up to four have been recorded (Davidson and Allison, 2003; Pearson and others, 2006). Polygyny rates can vary between sites, and among years at a given site. At some sites, polygynous males have much higher productivity than monogamous males (Paxton and others, 2007).

Nest building within the territory usually begins within a week or two after pair formation. Egg laying begins as early as mid-May, but more often starts in late May to mid-June. Chicks can be present in nests from late May through early August. Young typically fledge from nests from mid-June through mid-August; later fledglings are often products of re-nesting attempts. Breeding adults generally depart from their territories in early to mid-August, but may stay later if they fledged young late in the season. Males that fail to attract or retain mates, and males or pairs that are subject to significant disturbance, such as repeated nest parasitism or predation may leave territories by early July. Fledglings probably leave the breeding areas a week or two after adults, but few details are known.

Southwestern Willow Flycatcher territory size varies widely, probably due to differences in population density, habitat quality (including vegetation density and food availability), and nesting stage. Studies have reported estimated territory sizes ranging from 0.06 to 2.3 ha (Sogge and others, 1995; Whitfield and Enos, 1996; Bureau of Reclamation, 2009). At Roosevelt Lake, Ariz., measurements of home ranges, which include the defended territory and sometimes adjacent use areas, averaged 0.4 ha for actively breeding males; home range can be much larger for pre- and post-breeding males (Paxton and others, 2007). During incubation and nestling phases territory size, or at least the activity centers of pairs, can be very small. Flycatchers may increase their activity area after young are fledged, and use non-riparian habitats adjacent to the breeding area (Cardinal and others, 2006). This variability among sites, individual territories, and over time illustrates the challenge of defining a minimum habitat patch size for breeding flycatchers, or estimating the number of territories based simply on the size of a given breeding site.

At some breeding sites, non-territorial adult "floaters" will be present among the territorial population. Floaters are quieter and less aggressive than territorial adults, and therefore are harder to detect and frequently overlooked. Most floaters are young males, and float for only a single year. At Roosevelt Lake, floaters typically accounted for 3–8 percent of the known adult population, although the rate was much higher in drought years when habitat quality was lower (Paxton and others, 2007). The presence of floaters in a population may indicate that there is not enough high quality habitat to support all potentially territorial individuals present in a given breeding season.

Nests and Eggs

Historically, 75–80 percent of reported Southwestern Willow Flycatcher nests were placed in willows (Phillips, 1948; Phillips and others, 1964; Hubbard, 1987; Unitt, 1987). Southwestern Willow Flycatchers still commonly place their nests in native plants, but will often build nests in exotics, such as saltcedar and Russian olive (Sogge and Marshall, 2000; Stoleson and Finch, 2003; Durst and others, 2008a). In Arizona, most nests are in saltcedar or willows (Paradzick and Woodward, 2003; McLeod and others, 2007). In a unique situation in San Diego County, Calif., the flycatcher nests in coast live oak (*Quercus agrifolia*) along the San Luis Rey River (Haas, 2003), where oak became the dominant plant species adjacent to the river following willow removal in the 1950s. In another unusual situation, flycatchers in the Cliff-Gila Valley in New Mex. nest in tall boxelder (Stoleson and Finch, 2003). Southwestern Willow Flycatcher nests also have been found in buttonbush, black twinberry (*Lonicera involucrata*), Fremont cottonwood (*Populus fremontii*), alder (*Alnus* spp.), blackberry (*Rubus ursinus*), baccharis (*Baccharis* spp.), and stinging nettle (*Urtica* spp.). Overall, flycatcher nest site selection appears to be driven more by plant structure than by species composition.

Southwestern Willow Flycatchers build open cup nests approximately 8 cm high and 8 cm wide (outside dimensions), exclusive of any dangling material at the bottom. Females build the nest with little or no assistance from the males. Nests typically are placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. Nest height is highly variable and depends on the available plant structure within the territory; nests have been found from 0.6 m to approximately 20 m above ground. In any given habitat type or nest substrate, nests can be placed wherever suitable twig structure and vegetative cover are present.

Egg laying generally begins from mid-May through mid-June, depending on the geographic area and elevation. Willow Flycatcher eggs are buffy or light tan, approximately 18 mm long and 14 mm wide, with brown markings in a wreath at the blunt end. Clutch size is usually three or four eggs for first nests. Only the female develops a brood patch and incubates the eggs. Incubation lasts 12–13 days from the date the last egg is laid, and all eggs typically hatch within 24–48 hours of each other.

Flycatcher chicks are altricial and weigh only about 1–2 g at hatching, but grow rapidly and are ready to leave the nest at 12–15 days of age (Sedgwick, 2000; Paxton and Owen, 2002). The female provides most or all initial care of the young, although the role of the male increases with the age and size of nestlings. After Willow Flycatchers fledge at 12–15 days of age, they stay close to the nest and each other for 3–5 days, and adults continue feeding the fledged young for approximately 2 weeks. Recently fledged birds may repeatedly return to and leave the nest during this period (Spencer and others, 1996). Both male and female adults feed the fledged young, which give frequent, loud "*peep*" calls.

Southwestern Willow Flycatchers readily re-nest following an unsuccessful nesting attempt, although rarely more than once (Ellis and others, 2008). They also will sometimes nest again (double brood) following a successful nesting attempt, although this is more uncommon than re-nesting and varies between sites and years. From 2002 to 2008 at Elephant Butte Reservoir, approximately 13 percent of the pairs produced two successful nests per year (Ahlers and Moore, 2009). The productivity gains from pairs having successful second nests are important drivers of positive population growth (Paxton and others, 2007; Moore and Ahlers, 2009).

Replacement nests are built in the same territory, either in the same plant or at a distance of as much as 20 m from the previous nest. Reuse of old nests is uncommon, but does occur (Yard and Brown, 1999; Darrell Ahlers, Bureau of Reclamation, unpub. data, 2009). Replacement nest building and egg laying can occur (uncommonly) as late as the end of July or early August. Pairs may attempt a third nest if the second fails. However, clutch size, and therefore potential productivity, decreases with each nest attempt (Whitfield and Strong, 1995; Ellis and others, 2008).

Food and Foraging

The breeding season diet of Southwestern Willow Flycatchers is relatively well documented (DeLay and others, 2002; Drost and others, 2003; Durst, 2004; Wiesenborn and Heydon, 2007; Durst and others, 2008b). Breeding flycatchers are exclusively insectivorous, and consume a wide range of prey taxa ranging in size from small leafhoppers (Homoptera) to large dragonflies (Odonata). Major prey taxa include bugs (Hemiptera), bees and wasps (Hymenoptera), flies (Diptera), and leafhoppers; however, diet can vary widely between years and among different habitat types. There is no known differences in diet by sex, but there are differences between adult and nestling diet in the proportions of some arthropod groups. Differences in the composition of arthropods in flycatcher diet have been documented between native and exotic habitats, and between years within particular breeding sites; however, flycatchers appear able to tolerate substantial variation in relative prey abundance, except in extreme situations such as severe droughts (Durst and others, 2008b).

Willow Flycatchers of all subspecies forage primarily by sallying from a perch to perform aerial hawking and gleaning (Sedgwick, 2000; Durst, 2004). Males and females forage with similar maneuvers, although males may forage higher in the tree canopy than females. Foraging frequently takes place at external edges or internal openings within a habitat patch, or at the top of the upper canopy.

Site Fidelity and Survivorship

Based on studies of banded birds, most adult Southwestern Willow Flycatchers that survive from one year to the next will return to the same river drainage, often in proximity to the same breeding site (U.S. Fish and Wildlife Service, 2002; McLeod and others, 2007; Paxton and others, 2007). However, it is common for individual flycatchers to return to different sites within a breeding area, and even to move between breeding areas, from one year to the next. Some of this movement may be related to breeding success and habitat quality. At Roosevelt Lake, those birds that moved to different sites within a breeding area had on average higher productivity in the year following the move than in the year before the move (Paxton and others, 2007). At Roosevelt Lake and on the San Pedro and Gila Rivers, movement out of breeding patches also increased with the relative age of a patch, which may indicate a preference for younger riparian vegetation structure.

In addition to movements within a breeding site, long-distance movements within and between drainages have been observed (Paxton and others, 2007), at distances up to approximately 450 km. Dispersal of first-year flycatchers is more extensive than adult birds, as typical for most bird species.

Survivorship within the breeding season can be very high, averaging 97 percent at Roosevelt Lake (Paxton and others, 2007). Between-year survivorship of adults can be highly variable, but appears to be similar to that of most small passerine birds studied, with estimates generally ranging from approximately 55 to 65 percent (Stoleson and others, 2000; McLeod and others, 2007; Paxton and others, 2007; Schuetz and Whitfield, 2007). Males and females have similar survivorship rates.

Estimated survivorship of young birds (from hatching to the next breeding season) is highly variable, depending in part on how the estimates are generated (Stoleson and others, 2000). Generally reported as between 15 and 40 percent, juvenile survivorship typically is lower than adult survivorship (Whitfield and Strong, 1995; Stoleson and others, 2000; McLeod and others, 2007). Early fledging young have higher survivorship than those that leave the nest later in the season (Whitfield and Strong, 1995; Paxton and others, 2007). Most flycatchers survive for only 1–2 adult years, and mean life expectancy in Arizona was estimated to be 1.9 years following fledging. However, some individuals live much longer. The maximum reported ages of banded Southwestern Willow Flycatchers are 9–11 years (Sedgwick, 2000; Paxton and others, 2007).

Overall, the Southwestern Willow Flycatcher population appears to persist as one or more widely dispersed metapopulations (Busch and others, 2000; U.S. Fish and Wildlife Service, 2002), with movement of individuals, and thus genetic exchange, occurring across the landscape. However, the amount of movement and interchange is lower among sites that are farther apart or more isolated. Some sites serve as population sources while others may be sinks; some sites will be ephemeral over periods of years or decades. Flycatcher movement and dispersal among sites is important for initial site colonization and subsequent recolonization.

There are few general predictors for the persistence of breeding sites. Relatively large populations, such as the Kern River Preserve, San Pedro River, Elephant Butte Reservoir, and the Gila River have persisted for 10 or more years. However, such large sites can be subject to major changes in population numbers, and even potential extirpation, due to changes in local hydrology, site inundation, drought, etc. (Moore, 2005; Paxton and others, 2007). Although some small populations may be ephemeral and last only a few years (Durst and others, 2008a), others have remained occupied for much longer periods (Kus and others, 2003). Breeding populations also may reappear at unoccupied sites following 1–5 year absences. Suitable flycatcher habitat also can develop—and poor quality habitat can improve—relatively quickly in some sites, under favorable hydrological conditions. For example, at Roosevelt Lake and the San Pedro River (AZ), the age of riparian vegetation when first colonized was as young as 3 years (Paxton and others, 2007). In the same study, flycatchers moved back into older habitat patches when nearby younger, occupied habitat was inundated or scoured away.

Overall, the vegetation and flycatcher occupancy of a habitat patch or river drainage are often dynamic; few if any sites remain static over time. The amount of suitable flycatcher habitat can substantially increase or decrease in just a few years, at local and regional scales. Flycatchers can respond quickly to habitat changes, colonizing new sites if available and abandoning others. Therefore, one cannot assume that local, regional, or rangewide flycatcher population numbers will remain stable over time.

Threats to the Flycatcher and Habitat

The greatest historical factor in the decline of the Southwestern Willow Flycatcher is the extensive loss, fragmentation, and modification of riparian breeding habitat (U.S. Fish and Wildlife Service, 2002). Large-scale losses of southwestern wetlands have occurred, particularly the cottonwood-willow riparian habitats historically used by the Southwestern Willow Flycatcher (Unitt, 1987; General Accounting Office, 1988; Dahl, 1990; State of Arizona, 1990). Changes in the riparian plant community have frequently reduced, degraded, and eliminated nesting habitat for the flycatcher, curtailing its distribution and abundance.

Habitat losses and changes have occurred and continue to occur because of urban, recreational, and agricultural development, water diversion and impoundment, channelization, livestock grazing, and replacement of native habitats by introduced plant species (Marshall and Stoleson, 2000; U.S. Fish and Wildlife Service, 2002). Hydrological changes, natural or man-made, can greatly reduce the quality and extent of flycatcher habitat. Although riparian areas are often not considered as fire-prone, several Southwestern Willow Flycatcher breeding sites were destroyed by fire over the past decade (U.S. Fish and Wildlife Service, 2002), and others are at risk to similar catastrophic loss. Fire danger in these riparian systems may be exacerbated by increases in exotic vegetation, such as saltcedar, diversions or reductions of surface water, increased recreational activity, and drawdown of local water tables.

Although the degradation of many river systems and associated riparian habitat is a key cause of their absence, Southwestern Willow Flycatchers do not require free-running rivers or "pristine" riparian habitats. Most of the largest

Southwestern Willow Flycatcher populations in the last decade were found in reservoir drawdown zones, such as at Roosevelt Lake and Elephant Butte Reservoir. Many breeding populations are found on regulated rivers (Graf and others, 2002). In addition, the vegetation at many smaller flycatcher breeding sites is supported by artificial water sources such as irrigation canals, sewage outflow, or agricultural drainages (U.S. Fish and Wildlife Service, 2002). Although rising water levels could be detrimental to breeding flycatchers within a reservoir drawdown zone, reservoir fluctuations can simulate river dynamics with cycles of destruction and establishment of riparian vegetation, depositing rich sediments and flushing salt accumulations in the soil (Paxton and others, 2007). Therefore, managed and manipulated rivers and reservoirs have the potential to play a positive role by providing flycatcher breeding habitat. However, because rivers and reservoirs are not managed solely to create and maintain flycatcher habitat, the persistence of riparian vegetation in these systems—and any flycatchers breeding therein—is not assured.

Although the historic degradation and loss of native riparian negatively affected the Southwestern Willow Flycatcher, this species does not show an inherent preference for native vegetation. Instead, breeding habitat selection is based primarily on vegetation structure, density, size, and other stand characteristics, and presence of water or saturated soils (U.S. Fish and Wildlife Service, 2002). In fact, approximately 25 percent of known territories are found in habitat composed of 50 percent or greater exotic vegetative component—primarily saltcedar (Durst and others, 2008a). Saltcedar also can be an important habitat component in sites dominated by native vegetation (U.S. Fish and Wildlife Service, 2002, 2005). Despite suggestions that flycatchers breeding in saltcedar are suffering negative consequences and that removal of saltcedar is therefore a benefit (DeLoach and others, 2000; Dudley and DeLoach, 2004), there is increasing and substantial evidence that this is not the case. For example, Paxton and others (2007) found that flycatchers did not suffer any detectable negative consequences from breeding in saltcedar. This is consistent with the findings of Owen and others (2005) and Sogge and others (2006). Therefore, the rapid or large-scale loss of saltcedar in occupied flycatcher habitats, without rapid replacement of suitable native vegetation, could result in reduction or degradation of flycatcher habitat (U.S. Fish and Wildlife Service, 2002; Sogge and others, 2008).

In evaluating Southwestern Willow Flycatcher use of either native or exotic habitat, it is important to recognize that throughout the Southwest, there are many saltcedar-dominated and native-dominated habitats in which flycatchers do not breed (U.S. Fish and Wildlife Service, 2002; Sogge and others, 2006). Therefore, the use of any riparian patch—native or exotic—as breeding habitat will be site specific and will depend on the spatial, structural, and ecological characteristics of that particular patch and the potential for flycatchers to colonize and maintain populations within it.

Drought can have substantial negative effects on breeding flycatchers and their breeding habitat by reducing riparian vegetation vigor and density, and reducing prey availability (Durst, 2004; Paxton and others, 2007; Bureau of Reclamation, 2009). For example, the extreme drought of 2002 caused near complete reproductive failure of the large flycatcher population at Roosevelt Lake; among approximately 150 breeding territories, only two nests successfully fledged young in that year (Ellis and others, 2008). If future climate change produces more frequent or more sustained droughts, as predicted by many climate change models (for example, Seager and others, 2007), southwestern riparian habitats could be reduced in extent or quality. This scenario would present a challenge to the long-term sustainability of Southwestern Willow Flycatcher populations.

Brood parasitism by the Brown-headed Cowbird (*Molothrus ater*) was initially considered another significant threat to the Southwestern Willow Flycatcher (Whitfield, 1990; Harris, 1991; U.S. Fish and Wildlife Service, 1993, 1995; Whitfield and Strong, 1995; Sferra and others, 1997). Cowbirds lay their eggs in the nest of other species (the "hosts"), which raise the young cowbirds—often at the expense of reduced survivorship of their own young. Southwestern Willow Flycatchers seldom fledge any flycatcher young from nests that are parasitized by cowbirds (Whitfield and Sogge, 1999). Although parasitism negatively impacts some Southwestern Willow Flycatcher populations, especially at small and isolated breeding sites, it is highly variable and no longer considered among the primary rangewide threats to flycatcher conservation (U.S. Fish and Wildlife Service, 2002). Cowbird abundance, and therefore parasitism, tends to be a function of habitat type and quality, and the availability of suitable hosts, not specific to the flycatcher. Therefore, large-scale cowbirds control may not always be warranted unless certain impact thresholds are met (U.S. Fish and Wildlife Service, 2002; Rothstein and others, 2003; Siegle and Ahlers, 2004).

Section 2. Survey Protocol

The fundamental principles of the methodology described in this version have remained the same since the original Tibbitts and others (1994) and subsequent Sogge and others (1997a) protocols: the use of vocalization play-back, repeated site visits, and confirmation of flycatcher identity via the species-characteristic song. This newest protocol incorporates guidelines of the 2000 USFWS addendum, and includes changes based on our improved understanding of Willow Flycatcher biology and the significance of potential threats, and the availability of new survey technologies.

Several factors work together to make Southwestern Willow Flycatcher surveys challenging. Difficulties include the flycatcher's physical similarities with other species and subspecies; accessing the dense habitat they occupy; time constraints based on their breeding period; and vocalization patterns. Given these challenges, no methodology can assure 100-percent detection rates. However, the survey protocol described herein has proven to be an effective tool for locating flycatchers, and flycatchers generally are detectable when the protocol is carefully followed. Since 1995, hundreds of sites have been surveyed and thousands of flycatchers detected using the two previous versions of the survey protocol.

The Willow Flycatcher is 1 of 10 regularly occurring *Empidonax* flycatchers found in North America, all of which look very much alike. Like all *Empidonax*, Willow Flycatchers are nondescript in appearance, making them difficult to see in dense breeding habitat. Although the Willow Flycatcher has a characteristic *fitz-bew* song that distinguishes it from other birds (including other *Empidonax*), Willow Flycatchers are not equally vocal at all times of the day or during all parts of the breeding season. Because Southwestern Willow Flycatchers are rare and require relatively dense riparian habitat, they may occur only in a small area within a larger riparian system, thus decreasing detectability during general bird surveys. Migrating Willow Flycatchers (of all subspecies) often sing during their migration through the Southwest, and could therefore be confused with local breeders. In addition, Southwestern Willow Flycatchers are in breeding areas for only 3–4 months of the year. Surveys conducted too early or late in the year would fail to find flycatchers even at sites where they breed.

These life history characteristics and demographic factors influence how Southwestern Willow Flycatcher surveys should be conducted and form the basis upon which this protocol was developed. This protocol is based on the use of repeated call-playback surveys during pre-determined periods of the breeding season, to confirm presence or to derive a high degree of confidence regarding their absence at a site. Such species-specific survey techniques are necessary to collect reliable presence/absence information for rare species (Bibby and others, 1992).

The primary objective of this protocol is to provide a standardized survey technique to detect Southwestern Willow Flycatchers, determine breeding status, and facilitate consistent and standardized data reporting. The survey technique will, at a minimum, help determine presence or absence of the species in the surveyed habitat for that breeding season. Ultimately, the quality of the survey that is conducted will depend on the preparation, training, and in-the-field diligence of the individual surveyor.

This protocol is designed for use by persons who are non-specialists with *Empidonax* flycatchers or who are not expert birders. However, surveyors must have sufficient knowledge, training, and experience with bird identification and surveys to distinguish the Willow Flycatcher from other non-*Empidonax* species, and be able to recognize the Willow Flycatcher's primary song. A surveyor's dedication and attitude, willingness to work early hours in dense, rugged and wet habitats, and their ability to remain alert and aware of important cues also are important. Surveys conducted improperly or by unqualified, inexperienced, or complacent personnel may lead to inaccurate results and unwarranted conclusions.

Surveys conducted by qualified personnel in a consistent and standardized manner will enable continued monitoring of general population trends at and between sites, and between years. Annual or periodic surveys in cooperation with State and Federal agencies should aid resource managers in gathering basic information on flycatcher status and distribution at various spatial scales. Identifying occupied and unoccupied sites will assist resource managers in assessing potential impacts of proposed projects, avoiding impacts to occupied habitat, identifying suitable habitat characteristics, developing effective restoration management plans, and assessing species recovery.

The earlier versions of this protocol (Tibbitts and others, 1994; Sogge and others, 1997a) were used extensively and successfully for many years. Hundreds of flycatcher surveys conducted throughout the Southwest since 1994 revealed much about the usefulness and application of this survey technique. Three important lessons were: (1) the call-playback technique works and detects flycatchers that would have otherwise been overlooked; (2) multiple surveys at each site are important; and (3) with appropriate effort, general biologists without extensive experience with *Empidonax* can find and verify Willow Flycatcher breeding sites.

This revised protocol is still based on call-playback techniques and detection of singing individuals. However, it includes changes in the timing and number of surveys to increase the probability of detecting flycatchers and to help determine if they are breeders or migrants. It also incorporates the basic premise of the USFWS 2000 addendum to the 1997 protocol by requiring a minimum of five surveys in all "project-related" sites. A detailed description of surveys and

timing is discussed in section, "Timing and Number of Visits." Changes in the survey data sheets make them easier to use and submit, and allow reporting all site visits within a single year on one form. The new survey forms also are formatted such that the data on the respective forms can be easily incorporated into the flycatcher range-wide database.

This protocol is intended to determine if a habitat patch contains territorial Southwestern Willow Flycatchers, and is not designed establish the exact distribution and abundance of flycatchers at a site. Determining precise flycatcher numbers and locations requires many more visits and additional time observing the behavior of individual birds. This survey protocol also does not address issues and techniques associated with nest monitoring or other flycatcher research activities. Those efforts are beyond the scope usually needed for most survey purposes, and require advanced levels of experience and skills to gather useful data and avoid potential negative effects to the flycatcher. If nest monitoring is a required component of your study, refer to Rourke and others (1999) for appropriate nest monitoring techniques (available for download at http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/reports.asp).

Biologists who are not expert birders or specialists with regard to *Empidonax* flycatchers can effectively use this protocol. However, users should attend a U.S. Fish and Wildlife Service-approved Southwestern Willow Flycatcher survey training workshop, and have knowledge and experience with bird identification, surveys, and ecology sufficient to effectively apply this protocol.

Permits

Federal endangered species recovery permits are required for surveys in all USFWS regions where the Southwestern Willow Flycatcher breeds (application forms can be downloaded at http://www.fws.gov/forms/3-200-55.pdf). State permits also may be required before you can survey within any of the States throughout the Southwestern Willow Flycatcher's range: be certain to check with the appropriate State wildlife agency in your area. It usually takes several months to receive permits, so apply early to avoid delays in starting your surveys. You also must obtain permission from government agencies and private landowners prior to conducting any surveys on their lands.

Pre-Survey Preparation

The degree of effort invested in pre-survey preparation will have a direct effect on the quality and efficiency of the surveys conducted. Pre-survey preparation is often overlooked, but can prove to be one of the more important aspects in achieving high-quality survey results.

Surveyors should study calls, songs, drawings, photographs, and videos of Willow Flycatchers. Several web sites describe life history requirements, and provide photographs and vocalizations. It is especially critical for surveyors to be familiar with Willow Flycatcher vocalizations before going in the field. Although the *fitz-bew* song is the basis of verifying detections using this protocol, Willow Flycatchers use many other vocalizations that are valuable in locating birds and breeding sites. We strongly encourage that all surveyors learn as many vocalizations as possible and refer to the on-line "Willow Flycatcher Vocalizations; a Guide for Surveyors" (available at http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/wiflvocl.asp). Several commercial bird song recordings include Willow Flycatcher vocalizations, but these recordings typically have only a few vocalizations and the dialects may differ from those heard in the Southwest.

If possible, visit known Willow Flycatcher breeding sites to become familiar with flycatcher appearance, behavior, vocalizations, and habitat. Such visits are usually part of the standardized flycatcher survey workshops. All visits should be coordinated with USFWS, State wildlife agencies, and the property manager/owner, and must avoid disturbance to territorial flycatchers. While visiting these sites, carefully observe the habitat characteristics to develop a mental image of the key features of suitable habitat.

Surveyors must be able to identify, by sight and vocalizations, other species likely to be found in survey areas that may be confused with Southwestern Willow Flycatchers. These include Bell's Vireo (*Vireo bellii*), Western Wood-pewee (*Contopus sordidulus*), young or female Vermillion Flycatchers (*Pyrocephalus rubinus*), and other *Empidonax* flycatchers. At a distance, partial song or call notes of Bell's Vireo, Ash-throated Flycatchers (*Myiarchus cinerascens*) and some swallows can sound considerably like a *fitz-bew*. Surveyors also should be able to identify Brown-headed Cowbirds by sight and vocalizations. It is worthwhile to make one or more pre-survey trips to the survey sites or other similar areas to become familiar with the local bird fauna. You might consider obtaining a species list relative to your area and become familiar with those species by site and sound.

Prior to conducting any presence/absence surveys in your respective State or USFWS Region, contact the respective flycatcher coordinators to discuss the proposed survey sites and determine if the sites have been surveyed in prior years. If possible, obtain copies of previous survey forms and maintain consistency with naming conventions and site boundaries. Study the forms to determine if flycatchers have been previously detected in the site, record locations of any previous detections, and read the comments provided by prior surveyors. While surveying, be sure to pay special attention to any patches where flycatchers have previously been detected.

Familiarity with the survey site prior to the first surveys is the best way to be prepared for the conditions you will experience. Determine the best access routes to your sites and always have a back-up plan available in the event of unforeseen conditions (for example, locked gates, weather, etc.). Know the local property boundaries and where the potential hazards may be, including deep water, barbed wire fencing, and difficult terrain. Be prepared to work hard and remain focused and diligent in a wide range of physically demanding conditions. At many sites, these include heat, cold, wading through flowing or stagnant water, muddy or swampy conditions, crawling through dense thickets (often on hands and knees), and exposure to snakes, skunks, and biting insects.

It is imperative that all surveyors exercise the adage "safety first." Be aware of safety hazards and how to avoid them, and do not allow the need to conduct surveys to supersede common sense and safety. Inform your coworkers where you will be surveying and when you anticipate returning. Always take plenty of water and know how to effectively use your equipment, especially compass, Global Positioning System (GPS), and maps.

Equipment

The following equipment is necessary to conduct the surveys:

1. **USGS topographic maps of the area**: A marked copy is required to be attached to survey data sheets submitted at the end of the season. Be sure to always delineate the survey area and clearly mark any flycatcher detections. If the survey area differed between visits; delineate each survey individually.
2. **Standardized survey form**: Always bring more copies than you think you need.
3. **Lightweight audio player**: Be sure the player has adequate volume to carry well; use portable speakers if necessary. Several digital devices, such as CD players and MP3 players, are currently available and can be connected to external amplified speakers for broadcasting the flycatcher vocalizations. However, not all are equally functional or effective in field conditions; durability, reliability, and ease of use are particularly important. Talk to experienced surveyors for recommendations on particular models and useful features.
4. **Extra player and batteries**: In the field, dirt, water, dust, and heat often cause equipment failure, and having backup equipment helps avoid aborting a survey due to equipment loss or failure.
5. **Clipboard and permanent (waterproof) ink pen**: We recommend recording survey results directly on the survey data form, to assure that you collect and record all required data and any field notes of interest.
6. **Aerial photographs**: Aerial photographs can significantly improve your surveys by allowing you to accurately target your efforts, thus saving time and energy in the field. Previously, aerial images were often expensive and difficult to obtain. However, it is now easy to get free or low-cost images from sources, such as Google© Earth. Even moderate resolution images generally are better than none. For higher resolution aerial photographs, check with local planning offices and/or State/Federal land-management agencies for availability. Take color photocopies, not the original aerial photographs, with you in the field. Aerial photographs also are very useful when submitting your survey results but cannot be substituted in lieu of the required topographic map.
7. **Binoculars and bird field guide**: Although this protocol relies primarily on song detections to verify flycatcher presence, good quality binoculars are still a crucial field tool to help distinguish between possible Southwestern Willow Flycatchers and other species. Use a pair with 7–10 power magnification that can provide crisp images in poor lighting conditions. A good field guide also is essential for the same reason.
8. **GPS unit**: A GPS unit is needed for determining survey coordinates and verifying the location of survey plots on topographic maps. All flycatcher detections should be stored as waypoints and coordinates recorded on the survey form. A wide variety of fairly inexpensive GPS units are currently available. Most commercially available units will provide accuracy within 10 m, which is sufficient for navigating and marking locations.
9. **Compass**: Surveyors should carry a compass to help them while navigating larger habitat patches. This is an important safety back-up device, because GPS units can fail or lose power. Most GPS units have a feature to provide an accurate bearing to stored waypoints (for example, previous flycatcher detections, your parked vehicle, etc.); however, many units do not accurately display the direction in which the surveyor is traveling slowly through dense vegetation. A compass set to the proper bearing provides a more reliable method to navigate the survey site and relocate previously marked locations.

The following equipment also is recommended:

10. **Camera:** These are very helpful for habitat photographs, especially at sites where flycatchers are found. Small digital cameras are easily portable and relatively inexpensive.
11. **Survey flagging:** Used for marking survey sites or areas where flycatcher are detected. Check with the local land owner or management agency before flagging sites. Use flagging conservatively so as to not attract people or predators.
12. **Field vest:** A multi-pocket field vest can be very useful for carrying field equipment and personal items. We recommend muted earth-tone colors.

13. **Cell phone and/or portable radio**: In addition to providing an increased level of safety, cell phones or portable radios may be used by surveyors to assist each other in identifying territories and pairs in dense habitats, or where birds are difficult to hear.

In addition to the necessary equipment mentioned above, personal items, such as food, extra water or electrolyte drink, sunscreen, insect repellent, mosquito net, first-aid kit, whistle, and a light jacket, also should be considered. Being prepared for unforeseen difficulties, and remaining as comfortable as conditions allow while surveying are important factors to conducting thorough and effective surveys.

All survey results (both negative and positive) should be recorded directly on data forms when possible. These data forms have been designed to prompt surveyors to record key information that is crucial to interpretation of survey results and characterization of study sites. Even if no flycatchers are detected or habitat appears unsuitable, this is valuable information and should be recorded. Knowing where flycatchers are not breeding can be as important as knowing where they are; therefore, negative data are important. Standardized data forms are provided in appendix 1, or can be downloaded online. Always check for updated forms prior to each year's surveys.

Willow Flycatcher surveys are targeted at this species and require a great deal of focused effort. Surveyors must be constantly alert and concentrate on detecting a variety of flycatcher cues and responses. Therefore, field work, such as generalized bird surveys (for example, point counts or walking transects) or other distracting tasks, should not be conducted in conjunction with Willow Flycatcher surveys. Avoid bringing pets or additional people who are not needed for the survey. Dress in muted earth-tone colors, and avoid wearing bright clothing.

Willow Flycatcher Identification

The Southwestern Willow Flycatcher is a small bird, approximately 15 cm long and weighing about 11–12 g. Sexes look alike and cannot be distinguished by plumage. The upper parts are brownish-olive; a white throat contrasts with the pale olive breast, and the belly is pale yellow. Two white wing bars are visible (juveniles have buffy wing bars) and the eye ring is faint or absent. The upper mandible is dark and the lower mandible light. The tail is not strongly forked. When perched, the Willow Flycatcher often flicks its tail upward. As a group, the *Empidonax* flycatchers are very difficult to distinguish from one another by appearance. The Willow Flycatcher also looks very similar to several other passerine species you may encounter in the field.

Given that Willow Flycatchers look similar to other *Empidonax* flycatchers that may be present at survey sites, the most certain way to verify Willow Flycatchers in the field is by their vocalization. For the purpose of this protocol, identification of Willow Flycatchers cannot be made by sight alone; vocalizations are a critical identification criterion, and specifically the primary song *fitz-bew*. Willow Flycatchers have a variety of vocalizations (see Stein, 1963; Sedgwick, 2000), but two are most commonly heard during surveys or in response to call-playback:

1. ***Fitz-bew***. This is the Willow Flycatcher's characteristic primary song. Note that *fitz-bews* are not unique to the southwestern subspecies; all Willow Flycatchers sing this characteristics song. Male Willow Flycatchers may sing almost continuously for hours, with song rates as high as one song every few seconds. Song volume, pitch, and frequency may change as the season progresses. During prolonged singing bouts, *fitz-bews* are often separated by short *britt* notes. *Fitz-bews* are most often given by a male, but studies have shown female Willow Flycatchers also sing, sometimes quite loudly and persistently (although generally less than males). Flycatchers often sing from the top of vegetation, but also will vocalize while perched or moving about in dense vegetation.
2. ***Whitt***. This is a call often used by nesting pairs on their territory, and commonly is heard even during periods when the flycatchers are not singing (*fitz-bewing*). The *whitt* call appears to be a contact call between sexes, as well as an alarm call, particularly when responding to disturbance near the nest. *Whitt* calls can be extremely useful for locating Willow Flycatchers later in the season when *fitz-bewing* may be infrequent, but are easily overlooked by inexperienced surveyors. When flycatcher pairs have active nests and particularly once young have hatched, *whitts* may be the most noticeable vocalization. However, many species of birds *whitt*, and a *whitt* is not a diagnostic characteristic for Willow Flycatchers. For example, the "*whitt*" of the Black-headed Grosbeak (*Pheucticus melanocephalus*) and Yellow-breasted Chat (*Icteria virens*) are often confused with that of the flycatcher.

The *fitz-bew* and *whitt* calls are the primary vocalizations used to locate Willow Flycatchers. However, other less common Willow Flycatcher vocalizations can be very useful in alerting surveyors to the presence of flycatchers. These include twittering vocalizations typically given during interactions between flycatchers and sometimes between flycatchers and other birds, bill snapping, *britt*'s, and *wheeo*'s. Because these sounds can be valuable in locating territories (Shook and others, 2003), they should be studied prior to going in the field. Willow Flycatcher vocalization recordings are available from Federal and State agency contacts and online at http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/. Standardized recordings of Southwestern Willow Flycatchers also are available online at http://www.naturesongs.com/tyrrcert.html#tyrr. Specifically, only *fitz-bews* and *britts* should be used for conducting surveys, to provide more robust comparative results among sites and years.

Willow Flycatcher song rates are highest early in the breeding season (late May–early June), and typically decline after eggs hatch. However, in areas with many territorial flycatchers or where an unpaired flycatcher is still trying to attract a mate, or where re-nesting occurs, singing rates may remain high well into July. Isolated pairs can be much quieter and harder to detect than pairs with adjacent territorial flycatchers. At some sites, pre-dawn singing (0330–0500 hours) appears to continue strongly at least through mid-July (Sogge and others, 1995). Singing rates may increase again later in the season, possibly coinciding with re-nesting attempts (Yard and Brown, 2003). The social dynamics of adjacent territories can strongly influence vocalization rates. A single "*fitz-bew*" from one flycatcher may elicit multiple responses from adjacent territories. When these interactions occur, it is a good opportunity to distinguish among territories and provides the surveyor with an estimate of territory numbers in the immediate area.

There are some periods during which Willow Flycatchers do not sing and even the use of call-playback sometimes fails to elicit any response. This can be particularly true late in the breeding season. Early and repeated surveys are the best way to maximize the odds of detecting a singing flycatcher and determining its breeding status.

Timing and Number of Visits

No survey protocol can guarantee that a Southwestern Willow Flycatcher, if present, will be detected on any single visit. However, performing repeated surveys during the early to mid-nesting season increases the likelihood of detecting flycatchers and aids in determining their breeding status. A single survey, or surveys conducted too early or late in the breeding cycle, do not provide definitive data and are of limited value.

For purposes of this survey protocol, we have divided the Southwestern Willow Flycatcher breeding season into three basic survey periods, and specified a minimum number of survey visits for each period (fig. 9). Although the Sogge and others (1997a) protocol recommended a minimum of one survey in each period, we now recommend a differing number of visits for general surveys versus project-related studies.

General surveys are conducted for the sole purpose of determining whether Willow Flycatchers are present or absent from a respective site, when there is no foreseeable direct or indirect impact to their habitat from a known potential project or change in site management. In such cases, a minimum of one survey visit is required in each of the three survey periods.

Project-related surveys are conducted to determine the presence or absence of Willow Flycatchers within a site when there is a potential or foreseeable impact to their habitat due to a potential project or change in site management. Additional surveys are required for project-related studies in order to derive a greater degree of confidence regarding the presence or absence of Willow Flycatchers.

All successive surveys must be at least 5 days apart; surveys conducted more closely are not considered to be separate surveys. Although a minimum of three or five surveys are required for general and project-related purposes, respectively, if the habitat patches are large, contiguous and extremely dense, additional surveys are strongly encouraged to ensure full coverage of the site.

If you are uncertain whether three general surveys or five project-related surveys are required for your respective study, contact your USFWS flycatcher coordinator. As noted earlier, this survey protocol will help determine if territorial flycatchers are present and their approximate locations; if your project requires fine-scale estimates of flycatcher numbers or distribution at a site, you may need to conduct more intensive efforts that include additional surveys, nest searches, and nest monitoring.

Survey Period 1: May 15–31.—For both general and project-related surveys: a minimum of one survey is required. The timing of this survey is intended to coincide with the period of high singing rates in newly arrived males, which tends to begin in early to mid-May. This is one of the most reliable times to detect flycatchers that have established their territories, so there is substantial value to conducting period 1 surveys even though not all territorial males may yet have arrived. Migrant Willow Flycatchers of multiple subspecies will likely be present and singing during this period. Because both migrant and resident Willow Flycatchers are present during this period, and relatively more abundant then in subsequent surveys, it is an excellent opportunity to hone your survey and detection skills and gain confidence in your abilities. Detections of flycatchers during period 1 also provide insight on areas to pay particular attention to during the next survey period.

Survey Period 2: June 1–24.—For general surveys: a minimum of one survey is required. For project-related surveys, a minimum of two surveys are required. Note that this differs from the minimum of one survey that was recommended in this period under the previous protocol (Sogge and others, 1997a). During this period, the earliest arriving males may already be paired and singing less, but later arriving males should still be singing strongly. Period 2 surveys can provide insight about the status of any flycatchers detected during survey period 1. For example, if a flycatcher is detected during survey period 1 but not survey period 2, the first detection may have been a migrant. Conversely, detecting a flycatcher at the same site during periods 1 and 2 increases the likelihood that the bird is not a migrant, although it does not necessarily confirm it. Survey period 2 also is the earliest time during which you are likely to find nesting activity by resident birds at most sites. Special care should be taken during this period to watch for activity that will verify whether the flycatchers that are present are attempting to breed. A little extra time and diligence should be spent at all locations where flycatchers were detected during survey period 1.

Survey Visit Timing, Numbers, and Detection Interpretation

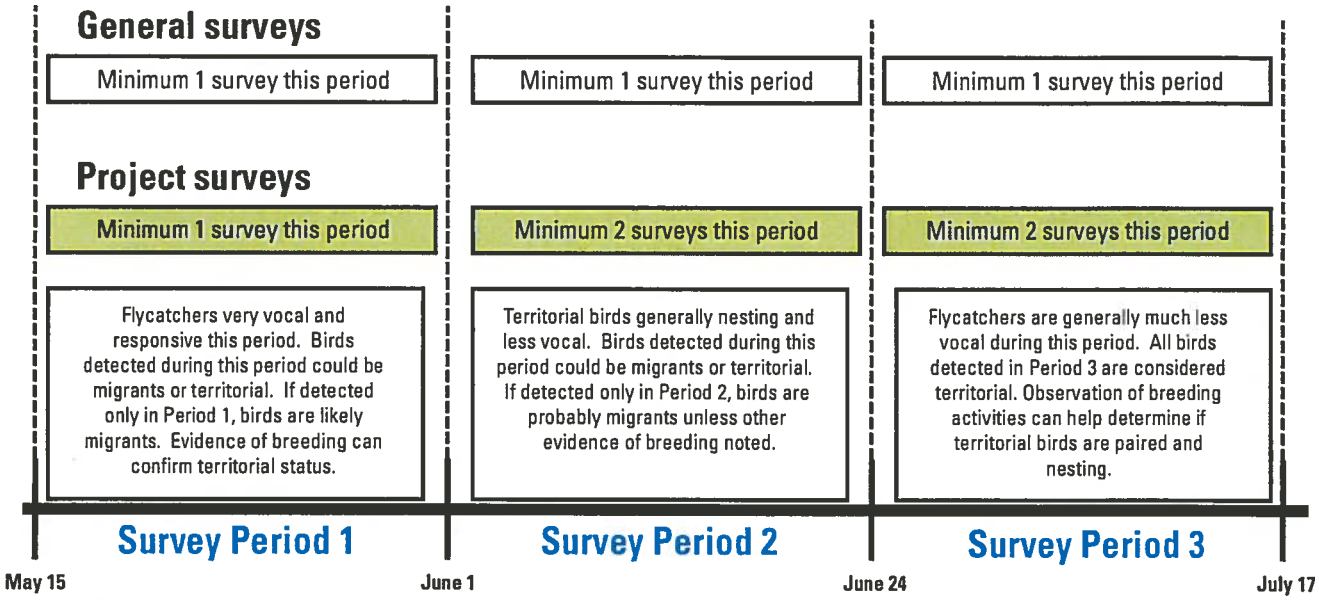


Figure 9. Recommended numbers and timing of visits during each survey period for general surveys and project surveys. General surveys are those conducted when there is no foreseeable direct or indirect impact to their habitat from a known potential project or change in site management. Project-related surveys are conducted when there is a potential or foreseeable impact to their habitat due to a potential project or change in site management.

Survey Period 3: June 25–July 17.—For general surveys, a minimum of one survey is required. For project-related surveys, a minimum of two surveys are required. Virtually all Southwestern Willow Flycatchers should have arrived on their territories by this time. Flycatcher singing rates probably have lessened, and most paired flycatchers will have initiated or even completed their first round of nesting activity. Migrant Willow Flycatchers should no longer be passing through the Southwest; therefore, any flycatchers that you detect are likely to be either territorial or nonbreeding floaters. Surveyors should determine if flycatchers detected during surveys in periods 1 or 2 are still present, and watch closely for nesting activity. Flycatchers that have completed a first nesting attempt may resume vigorous singing during this period. Extra time and diligence should be spent at all locations where flycatchers were detected during survey periods 1 or 2.

At high elevation sites (above 2,000 m), Southwestern Willow Flycatcher arrival and initiation of breeding activities may occur in early June, and possibly later in some years due to weather or migration patterns. Therefore, flycatcher breeding chronology may be delayed by 1 or 2 weeks at such sites, and surveys should be conducted in the latter part of each period.

It may not require multiple surveys to verify Southwestern Willow Flycatcher presence or breeding status. If, for example, Willow Flycatchers are observed carrying nest material during survey periods 1 or 2, this is conclusive verification they are breeders as opposed to migrants, regardless of what is found during period 3. However, it requires a minimum of three surveys for general studies and five surveys for project-related studies to determine with relative confidence that Southwestern Willow Flycatchers probably are not breeding at a site in that year, based on lack of detections.

We strongly encourage additional follow-up surveys to sites where territorial Southwestern Willow Flycatchers are verified or suspected. Extra surveys provide greater confidence about presence or absence of flycatchers at a site, as well as help in estimating the number of breeding territories or pairs, and determining breeding status and the outcome of breeding efforts. Pre-survey visits the evening before the survey or post-survey follow-up later in the morning can help confirm breeding status when surveyors are not under time constraints. However, avoid returning to a site so often as to damage the habitat, establish or enlarge trails, or cause undue disturbance to the flycatchers.

Survey Methods

The survey methods described below fulfill the primary objectives of documenting the presence or absence of Willow Flycatchers, and determining their status as territorial versus migrant. This protocol primarily is a call-playback technique, a proven method for eliciting response from nearby Willow Flycatchers (Seutin, 1987; Craig and others, 1992), both territorial and migrants. The premise of the call-playback technique is to simulate a territorial intrusion by another Willow Flycatcher, which generally will elicit a defensive response by the territorial bird, increasing its detectability. At each site, surveyors should broadcast a series of recorded Willow Flycatcher *fitz-bews* and *britts*, and look and listen for responses. In addition to maximizing the likelihood of detecting nearby flycatchers, this method also allows for positive identification by comparing the responding bird's vocalizations to the known Willow Flycatcher recording.

Documenting Presence/Absence—Begin surveys as soon as there is enough light to safely walk (about 1 hour before sunrise) and end by about 0900–1030 hours, depending on the temperature, wind, rain, background noise, and other environmental factors. Use your best professional judgment whether to conduct surveys that day based on local field conditions. If the detectability of flycatchers is being reduced by environmental factors, surveys planned for that day should be postponed until conditions improve. If observers are camped in or near potential Willow Flycatcher habitat, afternoons and evenings can be spent doing site reconnaissance and planning a survey strategy for the following morning. If camped immediately adjacent to survey sites, surveyors can awaken early and listen for flycatchers singing during the predawn period (0330–0500 hours), when territorial males often sing loudly.

Conduct surveys from within rather than from the perimeter of the sites, while limiting the breaking of vegetation or damaging the habitat. If surveys cannot be conducted from within the habitat, walk along the perimeter and enter the patch at intervals to broadcast the vocalizations and listen for responses. Flycatchers often respond most strongly if the recording is played from within the habitat and territory, rather than from the periphery. In addition, it can be surprisingly difficult to hear singing Willow Flycatchers that are even a short distance away amidst the noise generated by other singing and calling birds, roads, noisy streams, and other extraneous sounds. Therefore, it is preferable to survey from within the habitat, but always move carefully to avoid disturbing habitat or nests. Surveying from the periphery should not be conducted only for the sake of convenience, but is allowable for narrow linear reaches or when absolutely necessary due to safety considerations.

Because flycatchers may be clustered within only a portion of a habitat patch, it is critical to survey all suitable habitat within the patch. Small linear sites may be thoroughly covered by a single transect through the patch. For larger sites, choose a systematic survey path that assures complete patch coverage throughout the length and breadth of the site. This may require multiple straight transects, serpentine, zig-zag, or criss-cross routes. Aerial photographs and previous survey forms are valuable tools to help plan and conduct surveys, and to assure complete coverage. Always move carefully through the habitat to avoid disturbing vegetation or nests.

Initially approach each site and stand quietly for 1–2 minutes or longer, listening for spontaneously singing flycatchers. A period of quiet listening is important because it helps acclimate surveyors to background noises that can be quite loud due to roads, aircraft, machinery, waterways, and other sounds. It also allows surveyors to recognize and shift attention away from the songs and calls of other bird species, letting them focus on listening for flycatchers. Although it happens rarely, some singing Willow Flycatchers will actually stop vocalizing and approach quietly in response to a broadcast song, perhaps in an effort to locate what they perceive as an intruding male. Therefore, playing a recording before listening for singing individuals has at least some potential of reducing detectability.

If you do not hear singing flycatchers during the initial listening period, broadcast the Willow Flycatcher song recording for 10–15 seconds; then listen for approximately 1 minute for a response. Repeat this procedure (including a 10-second quiet pre-broadcast listening period) every 20–30 m throughout each survey site, more often if background noise is loud. The recording should be played at about the volume of natural bird calls, and not so loud as to cause distortion of the broadcast. We recommend that the playback recording include a series of *fitz-bews* interspersed with several *britts*.

Response to the broadcast call could take several forms. Early in the breeding season (approximately May–mid-June), a responding Willow Flycatcher will usually move toward the observer and *fitz-bew* or *whitt* from within or at the top of vegetation. Territorial Willow Flycatchers almost always vocalize strongly when a recording is played in their territory early in the season. If there are several flycatchers present in an area, some or all may start singing after hearing the recording or the first responding individual. Flycatchers can often hear the recording from far away but will not usually move outside of their territory, so listen for distant responses. Also, stay alert and listen for flycatchers vocalizing behind you that may not have responded when you were first in their territory. Another common flycatcher response is alarm calls (*whitts*) or interaction twitters from within nearby vegetation, particularly once nesting has begun. Willow Flycatchers will often sing after a period of *whitting* in response to a recording, so surveyors hearing *whitts* should remain in the area and quietly listen for *fitz-bews* for several minutes. Because some flycatchers may initially respond by approaching quietly, particularly during periods 2 and 3, it is critical to watch carefully for responding birds.

If you detect flycatchers that appear particularly agitated, it is possible that you are in close proximity to their nest. Agitated flycatchers may swoop down at the surveyor, snap their beaks, and otherwise appear distressed. Exercise extreme caution so as to not accidently disturb the nest, and move slowly away from the immediate area.

For the purpose of this protocol, detection of a *fitz-bew* song is essential to identify a bird as a Willow Flycatcher. Similar appearing species (including other *Empidonax* flycatchers) occur as migrants, and even breeders, at potential Willow Flycatcher sites. A few of these other species may even approach a broadcast Willow Flycatcher song and respond with vocalizations. In order to standardize interpretation of survey results and assure a high degree of confidence in surveys conducted by biologists of varying experience and skill, positive identification must be based on detection of the Willow Flycatcher's most unique characteristic—its song. It is important to remember that the *whitt* call is not unique to Willow Flycatchers, and therefore cannot serve as the basis of a positive identification. However, *whitts* are extremely useful for locating flycatchers and identifying areas needing follow-up visits. Loud, strong *whitting* may indicate a nearby nest, dictating that surveyors exercise extra caution moving through the area.

Whenever a verified or suspected Willow Flycatcher is detected, be careful not to overplay the song recording. Excessive playing could divert the bird from normal breeding activities or attract the attention of predators and brood parasites. Wildlife management agencies may consider overplaying the recording as "harassment" of the flycatcher, and this is not needed to verify species identification. Although flycatchers usually sing repeatedly once prompted, even a single *fitz-bew* is sufficient for verification. If you have played a recording several times and a bird has approached but has not *fitz-bewed*, do not continue playing the recording. If a potential Willow Flycatcher responds, approaches or *whitts* but does not sing, it is best to carefully back away and wait quietly. If it is a Willow Flycatcher, it probably will sing within a short time (5–10 minutes). Another option is to return to the same site early the following morning to listen for or attempt to elicit singing again. If you are still uncertain, record the location with your GPS, record comments on the survey form, and follow-up on the detection during subsequent surveys. If possible, request the assistance of an experienced surveyor to determine positive identification.

If more habitat remains to be surveyed, continue onward once a flycatcher is detected and verified. In doing so, move 30–40 m past the current detection before again playing the recording, and try to avoid double-counting flycatchers that have already responded. Willow Flycatchers, particularly unpaired males, may follow the broadcast song for 50 m or more.

Looking For and Recording Color Bands.—Several research projects have involved the capture and banding of Willow Flycatchers at breeding sites across the Southwest. In such projects, flycatchers are banded with one or more small colored leg bands, including a federal numbered band. As a result, surveyors may find color-banded individuals at their survey sites, and identification and reporting of the band combination can provide important data on flycatcher movements, survivorship, and site fidelity.

To look for bands, move to get a good view of the flycatcher's legs. This may be difficult in dense vegetation, but flycatchers commonly perch on more exposed branches at the edges of their territory or habitat patch. If bands are seen, carefully note the band colors. If there is more than one band on a leg, differentiate the top (farthest up the leg) from the bottom (closest to the foot), and those on the bird's left leg versus the right leg. If you are unsure of the color, do not guess. Instead, record the color as unknown. Incorrect color-band data are worse than incomplete data, so only record colors of which you are certain. The fact that a banded bird was seen, even without being certain of its color combination, is very important information. Record the color-band information on the survey form, and report the sighting to the appropriate State or Federal contact as soon as you return from the survey that day.

Determining the Number of Territories and Pairs.—Accurately determining the number of breeding territories and pairs can be more difficult than determining simple presence or absence. Flycatcher habitat is usually so dense that visual detections are difficult, and seeing more than one bird at a time is often impossible. Flycatchers sing from multiple song perches within their territories, and may be mistaken for more than one flycatcher. A flycatcher responding to or following a surveyor playing a recording may move considerable distances in a patch and thus be counted more than once. Territorial male flycatchers often sing strongly, but so do many migrants and some females, particularly in response to call-playback (Seutin, 1987; Unitt, 1987; Sogge and others, 1997b). Rangewide, many territorial male flycatchers are unmated, particularly those in small breeding groups. For these reasons, each singing flycatcher may not represent a territory or a mated pair. Following the established survey protocol and carefully observing flycatcher behavior can help determine if you have detected migrants, territorial birds, breeders, unmated birds, or pairs.

Given sufficient time, effort and observation, it is usually possible to approximate the number of territories and pairs. First, listen carefully for simultaneously singing flycatchers. Note the general location of each bird—especially concurrently singing individuals—on aerial photographs, map, or a site sketch. Spend some time watching each flycatcher to determine approximate boundaries of its territory, and how it interacts with other flycatchers. If one or more singing

birds stay primarily in mutually exclusive areas, they can be considered as separate territories. To determine if a flycatcher is paired, watch for interactions within a territory. Refer to the section, "Determining Breeding Status" for signs of pairing and breeding activity. Do not report a territorial male as a pair unless you observe one or more of the signs listed below. In some cases, it may be possible only to estimate the number of singing individuals. In other cases, it may take multiple site visits to differentiate territories or pairs.

Determining Breeding Status.—One way to determine if the flycatchers found at a particular site are migrants or territorial is to find out if they are still present during the "non-migrant" period, which generally is from about June 15 to July 20 (Unitt, 1987). A Willow Flycatcher found during this time probably is a territorial bird, although there is a small chance it could be a non-territorial floater (Paxton and others, 2007). If the management question is simply whether the site is a potential breeding area, documenting the presence of a territorial flycatcher during the non-migrant period may meet all survey objectives, and the site may not need to be resurveyed during the remainder of that breeding season.

However, in some cases, surveyors will be interested in knowing not only if territorial Southwestern Willow Flycatchers are present at a site, but also whether breeding or nesting efforts are taking place. Some males maintain territories well into July yet never succeed in attracting a mate, so unpaired males are not uncommon (McLeod and others, 2007; Ellis and others, 2008; Ahlers and Moore, 2009). Thus, an assumption that each singing male represents a breeding pair may not be well founded, especially in small populations. If it is important to determine whether a pair is present and breeding in that territory, move a short distance away from where the bird was sighted, find a good vantage point, and sit or lie quietly to watch for evidence of breeding. Signs of breeding activity include:

a. observation of another unchallenged Willow Flycatcher in the immediate vicinity (indicates possible pair);
b. *whitt* calls between nearby flycatchers (indicates possible pair);
c. interaction twitter calls between nearby flycatchers (indicates possible pair);
d. countersinging or physical aggression against another flycatcher or bird species (suggests territorial defense);
e. physical aggression against cowbirds (suggests nest defense);
f. observation of Willow Flycatchers copulating (verifies attempted breeding);
g. flycatcher carrying nest material (verifies nesting attempt, but not nest outcome);
h. flycatcher carrying food or fecal sac (verifies nest with young, but not nest outcome);
i. locating an active nest (verifies nesting). Recall that general survey permits do not authorize nest searching or monitoring, and see section, "Special Considerations";
j. observation of adult flycatchers feeding fledged young (verifies successful nesting).

You may be able to detect flycatcher nesting activity, especially once the chicks are being fed. Adults feed chicks at rates of as many as 30 times per hour, and the repeated trips to the nest tree or bush are often quite evident. Be sure to note on the flycatcher survey form any breeding activity that is observed, including detailed descriptions of the number of birds, and specific activities observed. Also note the location of breeding activities on an aerial photograph, map, or sketch of the area.

The number of flycatchers found at a site also can provide a clue as to whether they are migrants or territorial birds. Early season detections of single, isolated Willow Flycatchers often turn out to be migrants. However, discovery of a number of Willow Flycatchers at one site usually leads to verification that at least some of them remain as local breeders. This underscores the importance of completing a thorough survey of each site to be confident of the approximate number of flycatchers present.

In some cases, regardless of the time and diligence of your efforts, it will be difficult to determine the actual breeding status of a territorial male. In these instances, use your best professional judgment, or request the assistance of an experienced surveyor or an agency flycatcher coordinator to interpret your observations regarding breeding status.

Reporting Results.—There is little value in conducting formal surveys if the data are not recorded and submitted. Fill in all appropriate information on the Willow Flycatcher survey form while still in the field, and mark the location of detections on a copy of the USGS topographic map. Make a habit of reviewing the form before you leave any site—trying to remember specific information and recording it later can lead to missing and inaccurate data. Note the location of the sighting on an aerial photograph or sketch of the site. Attaching photographs of the habitat also is useful. Whenever a Willow Flycatcher territory or nest site is confirmed, notify the USFWS or appropriate State wildlife agency as soon as you return from the field. The immediate reporting of flycatcher detections or nests may differ among USFWS regions and States—discuss these reporting procedures with your respective State and USFWS flycatcher coordinators.

Complete a survey form (appendix 1) for each site surveyed, whether or not flycatchers are detected. "Negative data" (that is, a lack of detections) are important to document the absence of Willow Flycatchers and help determine what areas have already been surveyed. Make and retain a copy of each survey form, and submit the original or a legible copy. Electronic copies of the survey forms also are acceptable and are available online (http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/). All survey forms must be submitted to the USFWS and the appropriate State wildlife agency by the specified deadline identified in your permits. Timely submission of survey data is a permit requirement, and will ensure the information is included in annual statewide and regional reports.

Special Considerations

To avoid adverse impacts to Willow Flycatchers, follow these guidelines when performing all surveys:

1. Obtain all necessary Federal, State, and agency permits and permissions prior to conducting any surveys. Failure to do so leaves you liable for violation of the Endangered Species Act, various State laws, and prosecution for trespass.
2. Do not play the recording more than necessary or needlessly elicit vocal responses once Willow Flycatchers have been located and verified. This may distract territorial birds from caring for eggs or young, or defending their territory. If flycatchers are vocalizing upon arrival at the site, and your objective is to determine their presence or absence at a particular site—there is no need to play the recording. Excessive playing of the recording also may attract the attention of predators or brood parasites. Stop playing the survey recording as soon as you have confirmed the presence of a Willow Flycatcher, and do not play the recording again until you have moved 30–40 m to the next survey location.
3. Proceed cautiously while moving through Willow Flycatcher habitat. Continuously check the area around you to avoid disturbance to nests of Willow Flycatchers and other species. Do not break understory vegetation, even dead branches, to create a path through the surveyed habitat.
4. Do not approach known or suspected nests. Nest searches and monitoring require specific State and Federal permits, have their own specialized methodologies (Rourke and others, 1999), and are not intended to be a part of this survey protocol.
5. If you find yourself close to a known or suspected nest, move away slowly to avoid startling the birds or force-fledging the young. Avoid physical contact with the nest or nest tree, to prevent physical disturbance and leaving a scent. Do not leave the nest area by the same route that you approached. This leaves a "dead end" trail that could guide a potential predator to the nest/nest tree. If nest monitoring is a component of the study, but you are not specifically permitted to monitor the nest, store a waypoint with your GPS, affix flagging to a nearby tree at least 10 m away, and record the compass bearing to the nest on the flagging. Report your findings to an agency flycatcher coordinator or a biologist who is permitted to monitor nests.
6. If you use flagging to mark an area where flycatchers are found, use it conservatively and make certain the flagging is not near an active nest. Check with the property owner or land-management agency before flagging to be sure that similar flagging is not being used for other purposes in the area. Unless conducting specific and authorized/permitted nest monitoring, flagging should be placed no closer than 10 m to any nest. Keep flagging inconspicuous from general public view to avoid attracting people or animals to an occupied site, and remove it at the end of the breeding season.
7. Watch for and note the presence of potential nest predators, particularly birds, such as Common Ravens (*Corvus corax*), American Crows (*Corvus brachyrhynchos*), jays, and magpies. If such predators are in the immediate vicinity, wait for them to leave before playing the recording.
8. Although cowbird parasitism is no longer considered among the primary threats to flycatcher conservation it remains useful to note high concentrations of cowbirds in the comment section of the survey form. While conducting surveys, avoid broadcasting the flycatcher vocalizations if cowbirds are nearby, especially if you believe you may be close to an active flycatcher territory. The intent of not broadcasting flycatcher vocalizations is to reduce the potential for attracting cowbirds to a flycatcher territory or making flycatcher nests more detectable to cowbirds.
9. Non-indigenous plants and animals can pose a significant threat to flycatcher habitat and may be unintentionally spread by field personnel, including those conducting flycatcher surveys. Simple avoidance and sanitation measures can help prevent the spread of these organisms to other environments. To avoid being a carrier of non-indigenous plants or animals from one field site to another visually inspect and clean your clothing, gear, and vehicles before moving to a different field site. A detailed description on how to prevent and control the spread of these species is available by visiting the Hazard Analysis and Critical Control Point Planning for Natural Resource Management web site (http://www.haccp-nrm.org). One species of particular interest is the tamarisk leaf-beetle (*Diorhabda* spp.). If you observe defoliation of saltcedar while conducting flycatcher surveys and believe that *Diorhabda* beetles may be responsible, notify your USFWS coordinator immediately. Other non-native species of concern in survey locations are the quagga mussel (*Dreissena rostriformis bugensis*), cheatgrass (*Bromus tectorum*), red brome (*Bromus rubens*), giant salvinia (*Salvinia molesta*), water milfoil (*Myriophyllum spicatum*), parrot's feather (*M. aquaticum*), and amphibian chytrid fungus (*Batrachochytrium dendrobatidis*).

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Appendix 1. Willow Flycatcher Survey and Detection Form

Always check the U.S. Fish and Wildlife Service Arizona Ecological Services Field Office web site (http://www.fws.gov/southwest/es/arizona/) for the most up-to-date version.

Willow Flycatcher (WIFL) Survey and Detection Form (revised April 2010)

Site Name_____ State_____ County _____
USGS Quad Name _____ Elevation _____ (meters)
Creek, River, Wetland, or Lake Name_____
Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? Yes___ No___

Survey Coordinates: Start: E_____ N_____ UTM Datum_____(See instructions)
Stop: E_____ N_____ UTM Zone _____
If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

***** Fill in additional site information on back of this page *****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
Survey # 1 Observer(s)	Date						# Birds	Sex	UTM E	UTM N
	Start									
	Stop									
	Total hrs ___									
Survey # 2 Observer(s)	Date						# Birds	Sex	UTM E	UTM N
	Start									
	Stop									
	Total hrs ___									
Survey # 3 Observer(s)	Date						# Birds	Sex	UTM E	UTM N
	Start									
	Stop									
	Total hrs ___									
Survey # 4 Observer(s)	Date						# Birds	Sex	UTM E	UTM N
	Start									
	Stop									
	Total hrs ___									
Survey # 5 Observer(s)	Date						# Birds	Sex	UTM E	UTM N
	Start									
	Stop									
	Total hrs ___									

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total Survey Hrs_____					Were any Willow Flycatchers color-banded? Yes___ No ___ If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual _____ Date Report Completed_____ _____
US Fish and Wildlife Service Permit #_____State Wildlife Agency Permit #_____

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual _____ Phone # _____
Affiliation _____ E-mail _____
Site Name _____ Date Report Completed _____

Did you verify that this site name is consistent with that used in previous years? Yes ____ No _____ Not Applicable ___
If site name is different, what name(s) was used in the past? _____
If site was surveyed last year, did you survey the same general area this year? Yes ____ No ____ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes ____ No ____ If no, summarize below.

Management Authority for Survey Area : Federal____ Municipal/County ____ State ____ Tribal ____ Private ____
Name of Management Entity or Owner (e.g., Tonto National Forest) _____

Length of area surveyed: _____ (meters)

Vegetation Characteristics: Mark the category that best describes the predominant tree/shrub foliar layer at this site (check one):

_____ Native broadleaf plants (entirely or almost entirely, > 90% native, includes high-elevation willow)

_____ Mixed native and exotic plants (mostly native, 50 - 90% native)

_____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

_____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

_____

Average height of canopy (Do not include a range): _____ (meters)

Attach copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections.
Attach sketch or aerial photo showing site location, patch shape, survey route, location of any WIFLs or WIFL nests detected.
Attach photos of the interior of the patch, exterior of the patch, and overall site; describe any unique habitat features.

Comments (attach additional sheets if necessary)

_____
_____
_____
_____
_____
_____

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM N	UTM E	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Appendix 2. Willow Flycatcher Survey Continuation Sheet / Territory Summary Table

Always check the U.S. Fish and Wildlife Service Arizona Ecological Services Field Office web site (http://www.fws.gov/southwest/es/arizona/) for the most up-to-date version.

Willow Flycatcher Survey Continuation Sheet

(For reporting additional detections and territories; append to Survey and Detection form)

Reporting Individual _____ Phone # _____
Affiliation _____ E-mail _____
Site Name _____ Date Report Completed _____

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Comments _____

Appendix 3. Instructions for Completing the Willow Flycatcher Survey and Detection Form and the Survey Continuation Sheet

These instructions are provided as guidance for completing the standard survey form. It is particularly important to provide the correct type and format of information for each field. Complete and submit your survey forms to both the appropriate State Willow Flycatcher coordinator and the U.S. Fish and Wildlife Service (USFWS) by September 1 of the survey year. You also may complete forms digitally (Microsoft© Word or Excel) and submit them via email with attached or embedded topographic maps and photographs.

Page 1 of Survey Form

Site Name. Standardized site names are provided by the flycatcher survey coordinators for each State and should be consistent with the naming of other sites that might be in the area. If the site is new, work with your State or USFWS flycatcher coordinator to determine suitable site names before the beginning of the survey season. If the site was previously surveyed, use the site name from previous years (which can be obtained from the State or USFWS flycatcher coordinator). If you are uncertain if the site was previously surveyed, contact your State or USFWS flycatcher coordinator.

USGS Quad Name. Provide the full quad name, as shown on the appropriate standard 7.5-minute topographic maps.

Creek, River, Wetland, or Lake Name. Give the name of the riparian feature, such as the lake or watercourse, where the survey is being conducted.

Survey Coordinates. Provide the start and end points of the survey, which will indicate the linear, straight-line extent of survey area, based on Universal Transverse Mercator coordinates (UTMs). California surveyors only: provide latitude/longitude geographic coordinates instead of UTMs in the UTM fields and identify them as such. If the start and end points of the survey changed significantly among visits, enter separate coordinates for each survey in the comments section on the back of the survey sheet. Note that we do not need the coordinates for the detailed path taken by the surveyor(s).

Datum. Indicate the datum in which the coordinates are expressed: NAD27, WGS84, or NAD83. The datum can be found in the settings of most GPS units. Note that Arizona prefers NAD27 and New Mexico prefers NAD83.

Zone. Provide the appropriate UTM zone for the site, which is displayed along with the coordinates by most GPS units. Zones for California are 10, 11, or 12. The zone for Arizona is 12. Zones for New Mexico are 12 or 13.

Survey #. Survey 1 – 5. See the protocol for an explanation of the number of required visits for each survey period. **Note:** A survey is defined as a complete protocol-based survey that occurs over no more than 1 day. If a site is so large as to require more than a single day to survey, consider splitting the site into multiple subsites and use separate survey forms for each. Casual site visits, pre-season or supplemental visits, or follow-up visits to check on the status of a territory should not be listed in this column, but should be documented in the Comments section on page 2 or in the survey continuation sheet.

Date. Indicate the date that the survey was conducted, using the format mm/dd/yyyy.

Start and **Stop.** Start and stop time of the survey, given in 24-hour format (e.g., 1600 hours rather than 4:00 p.m.).

Total hours. The duration of time (in hours) spent surveying the site, rounded to the nearest tenth (0.1) hour. For single-observer surveys, or when multiple observers stay together throughout the survey, total the number of hours from survey start to end. If two or more observers surveyed sections of the site concurrently and independently, sum the number of hours each observer spent surveying the site.

Number of Adult WIFLs. The total number of individual adult Willow Flycatchers detected during this particular survey. Do not count nestlings or recently fledged birds.

Number of Pairs. The number of breeding pairs. Do not assume that any bird is paired; designation of birds as paired should be based only on direct evidence of breeding behaviors described in the protocol. If there is strong evidence that the detected bird is unpaired, enter "0". If it is unknown whether a territorial bird is paired, enter "–". Note that the estimated number of pairs can change over the course of a season.

Number of Territories. Provide your best estimate of the number of territories, defined as a discrete area defended by a resident single bird or pair. This is usually evidenced by the presence of a singing male, and possibly one or more mates. Note that the estimated number of territories may change over the course of a season.

Nest(s) Found? Yes or No. If yes, indicate the number of nests. Renests are included in this total.

Comments about this survey. Describe bird behavior, evidence of pairs or breeding, evidence of nest building, evidence of nestlings/fledglings, nesting, vocalizations (e.g., interaction twitter calls, *whitts*, *britts*, *wheeos*, *fitz-bews*/countersinging), potential threats (e.g., livestock, cowbirds, saltcedar leaf beetles [*Diorhabda* spp.] etc.). If *Diorhabda* beetles are observed, contact your USFWS and State flycatcher coordinator immediately. Please be aware that permits are needed for nest monitoring.

GPS Coordinates for WIFL Detections. Provide the number of birds (e.g., unpaired, paired, or groups of birds) and corresponding UTMs. If known, provide the sex of individuals.

Overall Site Summary. For each of these columns, provide your best estimate of the overall total for the season. Do not simply total the numbers in each column. In some cases where consistent numbers were detected on each survey, the overall summary is easy to determine. In cases where numbers varied substantially among the different surveys, use professional judgment and logic to estimate the most likely number of adults, pairs, and territories that were consistently present. Be careful not to double count individuals. Record only territorial adult Southwestern Willow Flycatchers, do not include migrants, nestlings, or fledglings in the overall summary. In complex cases, consult with your State or USFWS flycatcher coordinator.

Total Survey Hours. The sum of all hours spent surveying the site.

Were any WIFLs color-banded? Circle or highlight "Yes" or "No". If yes, report the sighting and color combination (if known) in the comments section on back of form, and contact your USFWS coordinator within 48 hours after returning from the survey. Note that identifying colors of bands is difficult and might require follow-up visits by experienced surveyors.

Reporting Individual. Indicate the full first and last name of the reporting individual.

Date Report Completed. Provide the date the form was completed in mm/dd/yyyy format.

U.S. Fish and Wildlife Service Permit #. List the full number of the required federal permit under which the survey was completed.

State Wildlife Agency Permit #. If a State permit is required by the State in which the survey was completed, provide the full number of the State permit. State permits are required for Arizona and California. State permits are recommended for New Mexico.

Page 2 of Survey Form

Affiliation. Provide the full name of the agency or other affiliation (which is usually the employer) of the reporting individual.

Phone Number. Self-explanatory; include the area code.

E-mail. Self-explanatory.

Was this site surveyed in a previous year? Indicate "Yes", "No", or "Unknown."

Did you verify that this site name is consistent with that used in previous years? Indicate "Yes" or "No". This can be determined by checking survey forms from previous years or consulting with agency flycatcher coordinators.

If site name is different, what name(s) was used in the past? Enter the full site name that was used in previous years.

If site was surveyed last year, did you survey the same general area this year? Indicate "Yes" or "No". If no, indicate the reason and how the survey varied in the Comments section.

Did you survey the same general area during each visit to this site this year? If no, indicate the reason in the Comments section and delineate the differing route of each survey on the topographical map.

Management Authority for Survey Area. Mark the appropriate management authority.

Name of Management Entity or Owner (e.g., Tonto National Forest). Provide the name of the organization or person(s) responsible for management of the survey site.

Length of area surveyed. Estimate the linear straight-line distance of the length of the area surveyed, in kilometers. This is not an estimate of the total distance walked throughout the survey site. Do not provide a range of distances.

Vegetation Characteristics: Mark only one of the categories that best describes the predominant tree/shrub foliar layer at the site.

Native broadleaf habitat is composed of entirely or almost entirely (i.e., > 90%) native broadleaf plants.

Mostly native habitat is composed of 50–90% native plants with some (i.e., 10–50%) non-native plants.

Mostly exotic habitat is composed of 50–90% non-native plants with some (i.e., 10–50%) native plants.

Exotic/introduced habitat is composed entirely or almost entirely (i.e., > 90%) of non-native plants.

Identify the 2–3 predominant tree/shrub species in order of dominance. Identify by scientific name.

Average height of canopy. Provide the best estimate of the average height of the top of the canopy throughout the patch. Although canopy height can vary, give only a single (not a range) overall height estimate.

Attach the following: (1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections; (2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests; (3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments. Include the flycatcher territory number and GPS location. You also may include a compact disc of photographs.

Comments. Include any information that supports estimates of total territory numbers and breeding status. You may provide additional information on bird behavior, banded birds, evidence of pairs or breeding, nesting, potential threats (e.g., livestock, cowbirds, saltcedar leaf beetles [*Diorhabda* spp.] etc.), and changes in survey length and route throughout the season. Attach additional pages or use the continuation sheet if needed.

Table. If Willow Flycatchers are detected, complete the table at the bottom of the form. Identify flycatchers by territory number and include the dates detected, UTMs, whether or not pairs were detected, and whether or not nests were located. Also describe the observation. For example, the surveyor might have observed and heard a bird *fitz-bew* from an exposed perch, heard and observed two birds interacting and eliciting a twitter call, heard a bird *fitz-bew* while observing another carrying nesting material, heard birds from territory 1 and 2 countersinging, etc. This information provides supporting information for territory and breeding status. Use the continuation sheet if needed.

Appendix 4. Example of a Completed Willow Flycatcher Survey and Detection Form (with map)

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: DL-08 State: New Mexico County: Socorro

USGS Quad Name: Paraje Well Elevation: 1,356 (meters)

Creek, River, or Lake Name: Rio Grande

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* X *No* ____

Survey Coordinates: Start: E 306,009 N 3,715,506 UTM Datum: NAD 83 (See instructions)

Stop: E 304,339 N 3,711,922 UTM Zone: 13

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

*****Fill in additional site information on back of this page*****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1	Date: 5/24/2009	5	0	5	N	Suitable breeding habitat dispersed throughout site. WIFLs were very vocal, and covering large areas. No obvious signs of pairing were observed. Approximately 10 head of cattle were found within this site.	1	M	305,276	3,714,926
Observer(s): D. Savage	Start: 5:45						1	M	305,131	3,714,628
							1	M	305,191	3,714,778
	Stop: 10:15						1	M	305,394	3,715,009
							1	M	305,084	3,714,732
	Total hrs: 4.5									
Survey # 2	Date: 6/10/2009	11	4	7	Y (3)	Portions of site are flooded, 1-2 ft deep. Two males found during 1st survey appear unpaired. Three pairs confirmed based on nesting, and another pair suspected based on vocal interactions and nonaggressive behavior with another flycatcher. Two additional territories (1 pair and 1 unpaired male) found during this survey.	# Birds	Sex	UTM E	UTM N
Observer(s): S. Kennedy	Start: 6:00						1	M	305,276	3,714,926
							1	M	305,131	3,714,628
	Stop: 10:15						2	M/F	305,191	714,778
							2	M/F	305,394	3,715,009
							2	M/F	305,084	3,714,732
	Total hrs: 4.3						2	M/F	305,001	3,714,640
							1	M	305,010	3,714,524
Survey # 3	Date: 6/21/2009	12	5	7	Y (4)	Portions of site still flooded. All territories found in Survey 2 are still active. The two males found during Surveys #1 and #2, still believed to be unpaired. All other territories are believed to be paired. Several cows observed in vicinity of active territories.	# Birds	Sex	UTM E	UTM N
Observer(s): S. Kennedy	Start: 5:30						1	M	305,276	3,714,926
							1	M	305,131	3,714,628
	Stop: 10:00						2	M/F	305,191	3,714,778
							2	M/F	305,394	3,715,009
							2	M/F	305,084	3,714,732
	Total hrs: 4.5						2	M/F	305,001	3,714,640
							2	M/F	305,010	3,714,524
Survey # 4	Date: 7/1/2009	12	5	7	Y (4)	Site is no longer flooded, but saturated soils persist throughout most of site. No change in territory numbers or status. All SWFL pairs very quiet - only a few whits and fitz-bews. Light rain over night, vegetation was saturated early in the morning. Lots of mosquitos!	# Birds	Sex	UTM E	UTM N
Observer(s): D. Moore	Start: 6:00						1	M	305,276	3,714,926
							1	M	305,131	3,714,628
	Stop: 10:00						2	M/F	305,191	3,714,778
							2	M/F	305,394	3,715,009
							2	M/F	305,084	3,714,732
	Total hrs: 4.0						2	M/F	305,001	3,714,640
							2	M/F	305,010	3,714,524
Survey # 5	Date: 7/10/2009	11	5	6	Y (4)	Site beginning to dry out, some portions still muddy. One of the unpaired males could not be detected. It was hard to hear SWFLs due to breezy conditions early in the morning.	# Birds	Sex	UTM E	UTM N
Observer(s): D. Moore	Start: 5:30						1	M	305,131	3,714,628
							2	M/F	305,191	3,714,778
	Stop: 10:00						2	M/F	305,394	3,715,009
							2	M/F	305,084	3,714,732
							2	M/F	305,001	3,714,640
	Total hrs: 4.5						2	M/F	305,010	3,714,524
Overall Site Summary Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any WIFLs color-banded? Yes ____ No X ____				
Total survey hrs: 21.8		12	5	7	4	If yes, report color combination(s) in the comments section on back of form and report to USFWS.				

Reporting Individual: Darrell Ahlers Date Report Completed: 8/20/2009

US Fish & Wildlife Service Permit #: TE819475-2 State Wildlife Agency Permit #: N/A

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual **Darrell Ahlers** Phone # **(303) 445-2233**
Affiliation **Bureau of Reclamation** E-mail dahlers@usbr.gov
Site Name **DL-08** Date report Completed **8/20/2009**
Was this site surveyed in a previous year? Yes x No ____ Unknown ____
Did you verify that this site name is consistent with that used in previous yrs? Yes x No ____ Not Applicable ____
If name is different, what name(s) was used in the past? **Not applicable**
If site was surveyed last year, did you survey the same general area this year? Yes x No ____ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes x No ____ If no, summarize below.

Management Authority for Survey Area: Federal X Municipal/County ____ State ____ Tribal ____ Private ____
Name of Management Entity or Owner (e.g., Tonto National Forest) **Bureau of Reclamation**

Length of area surveyed: **2.5** (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

____ Native broadleaf plants (entirely or almost entirely, > 90% native)

X Mixed native and exotic plants (mostly native, 50 - 90% native)

____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.
Salix Gooddingii, Populus spp., Tamarix spp.

Average height of canopy (Do not include a range): **6** (meters)

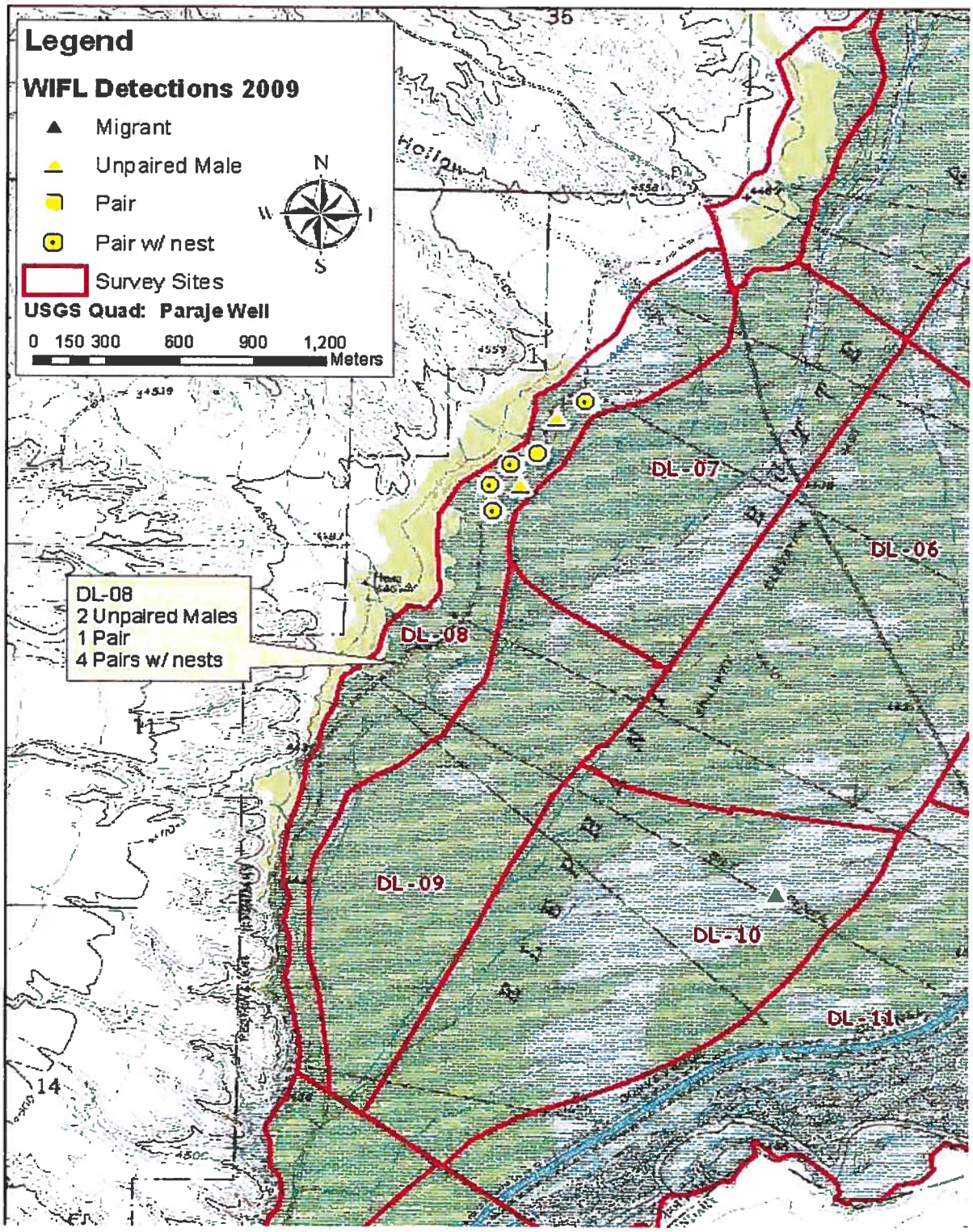
Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.
Great habitat with saturated or flooded soils throughout most of the site on 1st survey. Site began to dry by the end of the breeding season. SWFL territories are dominated by Gooddings willow, however Tamarix spp. tends to be increasing in density compared to previous years. Site is supported by flows from the Low Flow Conveyance Channel.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)
1 (Unpaired male)	5/24, 6/10,6/21,7/1	305,276	3,714,926	N	N	extended presence at site from 5/24 through 7/1, no evidence of pairing
2 (Unpaired male)	5/24, 6/10,6/21,7/1, 7/10	305,131	3,714,628	N	N	extended presence at site from 5/24 through 7/10, no evidence of pairing
3 (Pair)	5/24, 6/10,6/21,7/1, 7/10	305,191	3,714,778	Y	Y	Pair confirmed based on vocalizations and observation of unchallenged WIFL
4 (Pair w/nest)	5/24, 6/10,6/21,7/1, 7/10	305,394	3,715,009	Y	Y	Confirmed breeding status with nest
5 (Pair w/nest)	5/24, 6/10,6/21,7/1, 7/10	305,084	3,714,732	Y	Y	Confirmed breeding status with nest
6 (Pair w/nest)	6/10,6/21,7/1, 7/10	305,001	3,714,640	Y	Y	Confirmed breeding status with nest
7 (Pair w/nest)	6/10,6/21,7/1, 7/10	305,010	3,714,524	Y	N	Confirmed breeding status with nest

Attach additional sheets if necessary


Legend
WIFL Detections 2009
Migrant
Unpaired Male
Pair
Pair w/ nest
Survey Sites
USGS Quad: Paraje Well
0 150 300 600 900 1,200
Meters
N
W
E
S
DL-08
2 Unpaired Males
1 Pair
4 Pairs w/ nests
DL-07
DL-06
DL-08
DL-09
DL-10
DL-11
35
14

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For more information concerning the research in this report, contact

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Exhibit F-2

Final Report - NCCP/MSCP Raptor Monitoring Project (January 1, 2001 – December 31, 2003)

for

California Department Fish and Game
4949 Viewridge Ave.
San Diego, CA 92123

by

Wildlife Research Institute, Inc.
P.O. Box 2209
18030 Highland Valley Road
Ramona, CA 92065

March 31, 2005

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BACKGROUND

The Natural Communities Conservation Planning (NCCP) Raptor Monitoring Project is part of the urgent implementation tasks associated with the Multiple Species Conservation Program (MSCP). The MSCP is the local representation of the State's NCCP Program of which the City of San Diego is a participating member and the lead agency. The County of San Diego is also an active participant (County of San Diego 1997). The city adopted the MSCP on March 18, 1997 and entered into a binding contract on July 16, 1997 with the State of California Department of Fish and Game and the United States Fish and Wildlife Service to implement the MSCP.

Each habitat conservation plan (HCP) requires a monitoring program to determine the efficacy of that plan. The "Biological Monitoring Plan for the Multiple Species Conservation Program" (Ogden 1996) recommended monitoring for certain plant species, coastal sage scrub (Coastal California Gnatcatcher and Cactus Wren), herpetofauna, and grasslands (specifically, using raptors).

THE PROJECT AND ITS OBJECTIVES

Monitoring of raptors is a critical component of the MSCP. This project, specifically, addresses monitoring the raptor species identified as target species for MSCP monitoring with one exception--the Burrowing Owl (BO; *Athene cunicularia hypugaea*). In addition to the Burrowing Owl, the MSCP Biological Monitoring Plan (Ogden, 1996) identified the following raptor species (hereafter referred to as the "target" species) to be monitored: Golden Eagle (GE; *Aquila chrysaetos*), Bald Eagle (BE; *Haliaeetus leucocephalus*), Peregrine Falcon (PF; *Falco peregrinus*), Northern Harrier (NH; *Circus cyaneus*), Ferruginous Hawk (FH; *Buteo regalis*), Swainson's Hawk (SH; *Buteo swainsoni*), and Cooper's Hawk (CH; *Accipiter cooperii*). Prior to the subject work, no comprehensive study had been conducted for any of these species, within the geographical limits of the MSCP.

The Wildlife Research Institute, Inc. (WRI), a non-profit organization, has been working with all MSCP participants to identify appropriate long-term raptor monitoring locations (based on the results of the current WRI raptor surveys), develop a scientifically-based monitoring program (including survey locations and protocols), test the monitoring methods, and identify opportunities for population enhancements.

The original project objectives (taken from the contract's scope of work) are as follows:

- Determine where breeding and wintering individuals (of the target species) are located within the study areas.
- Wherever possible, document the breeding success of active pairs.
- Characterize situations of both successful and less successful or unsuccessful habitat.
- Identify, modify, or create, if necessary, survey raptor monitoring methods, based on scientific principles that would be appropriate to meet the objectives of the MSCP Monitoring Plan.
- Identify management, including research, needs and enhancement opportunities.

THIS REPORT

Constraints. This report covers WRI's raptor surveying activity for the three years of this project (January 1, 2001 through December 31, 2003), focusing on the breeding and wintering seasons. For the record, our work did not, officially, include the BO. Therefore, with few exceptions, surveys were not conducted during what would normally have been the most productive time for this species (i.e., early morning and early evening). Fieldwork was conducted during the daylight hours to maximize chances for seeing the diurnal raptors that were the focus of the contracted scope. Although nocturnal owls can be expected to nest and winter in many of the study sites, they would be expected to often escape observation under this temporal survey regime. However, our methods required documenting any raptor, regardless of whether or not it was a target species and, when a BO or any other owl was observed, it was noted.

A natural phenomenon created a situation that could be considered a constraint. This was the extreme drought that the region experienced for several years (1999-2004). Therefore, 2001 through 2003 may not have been the best of raptor breeding years. Drought clearly plays a significant factor in the density and reproductive success of raptors. This study was conducted during the worst drought for San Diego in over 160 years. This fact should be noted for future researchers and resource managers/planners. This kind of extreme drought has the potential effect of reducing the available prey biomass, which, in turn, can have at least two effects. First, it likely reduces the "attractiveness" of a habitat complex, partly because of low prey densities, and may encourage raptors and other predators to look elsewhere. Second, for those individuals that choose to stay in a less-than-ideal environment, the lack of prey often results in lowered reproductive success or even total nest failure (see Discussion, below). If a nest site is not successful, the birds are more likely to disperse, which leaves the historically active territories apparently, or actually, vacant.

Intent. It is the intent that this, the Final Report, will not only serve to (1) provide data analysis and interpretation but, importantly, it strives to (2) provide an initial baseline of information on many of the breeding and wintering raptors within the MSCP and environs, (3) identify resource management challenges and opportunities, and (4) recommend needed research and management, including what areas should be considered for the MSCP Long-term Raptor Monitoring Program (LRMP).

METHODS

LITERATURE REVIEW, INTERVIEWS, DATA SEARCHES, ETC.

We first contacted other professional biologists, regarding available literature and monitoring programs already in place. We acquired relevant literature, which we did not already have, and met with and/or phone-interviewed members of the outdoor-oriented public as well as key professionals in the San Diego ornithologist community (including Mr. John Oakley, Mr. David Mayer, Mr. Phil Unitt, Dr. Jim Hannan, and others listed in the Acknowledgements section) to inquire about raptor sightings. Using existing published and gray literature, the Natural Communities Data Base, museum collections, raw data from the San Diego County Bird Atlas (then in prep.), MSCP vegetation and sensitive species GIS data, and discussions with knowledgeable experts, a project bibliography, relevant to the MSCP and the target species, was produced (Appendix A).

STUDY SITES

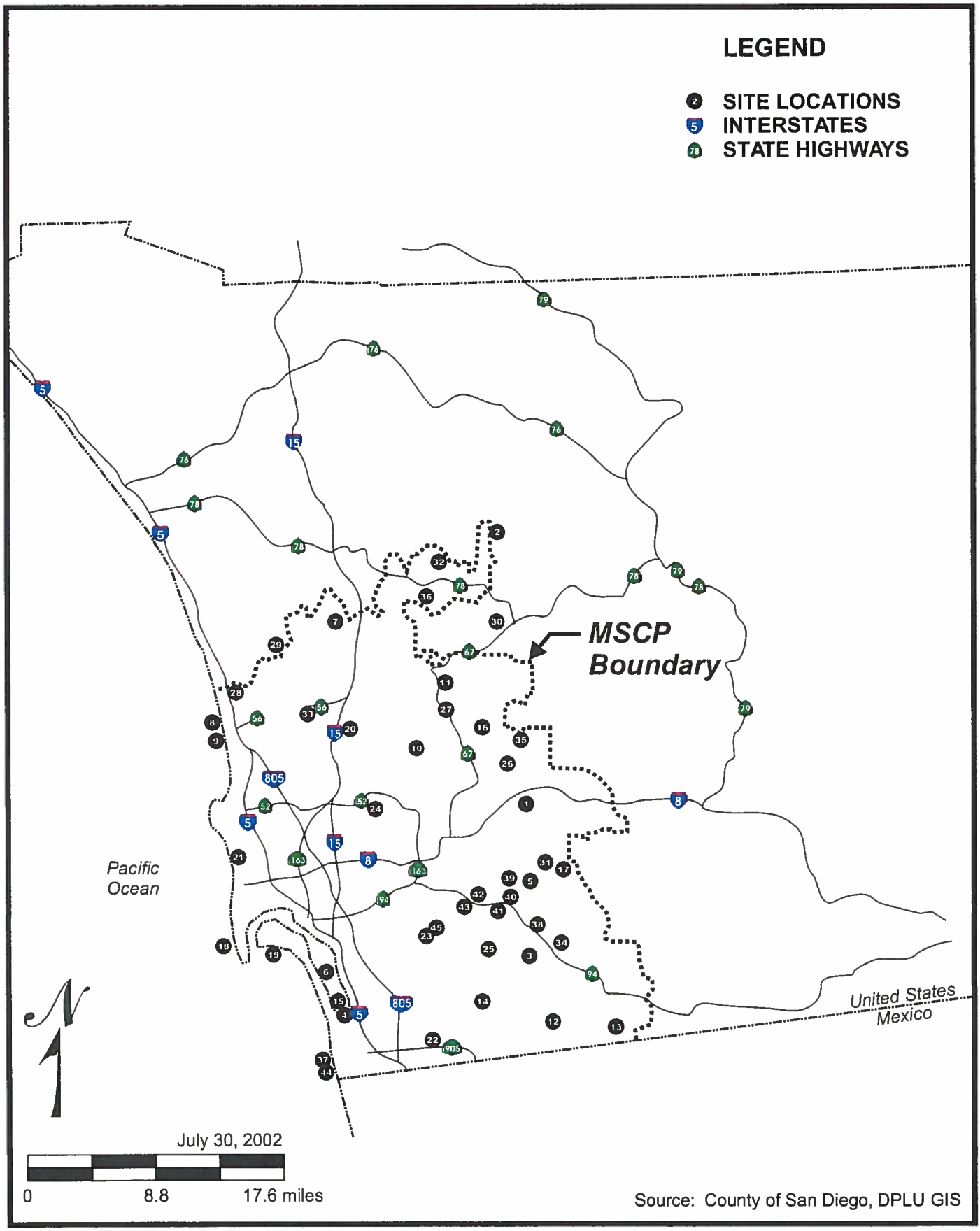
The choice of *study sites* (i.e., those which would be the focus of the 2001-2003 field observations) began with the raptor monitoring locations proposed by the "Biological Monitoring Plan for the Multiple Species Conservation Program" (Ogden 1996). Through consultations with CDFG staff and other knowledgeable biologists, we initially identified 22 sites. After some consolidation and the addition of several sites, including control sites and five sites recently acquired by the state or federal government (numbers 34, and 39 through 43), this number was, ultimately, increased to 45 locations within, and juxtaposed to, the MSCP (hereafter referred to as "study sites"; Figure 1 and Table 1). These became the sites, which were surveyed and considered as *potential* sites, or components of sites, for the Long-term *Monitoring* Plan. The basis for choosing the study sites included that they (1) could be expected to support raptors, (2) were part of an area which was managed by a public or private organization or, alternatively, could serve as a control site over time, (3) were accessible by vehicle and could be safely surveyed with repeatability, (4) contained grassland and/or other relevant habitat which was representative of the MSCP area, and (5) were within or immediately juxtaposed to the MSCP area. We considered all ten sites recommended by the Ogden (1996) report. Of those ten sites, we believe all are covered by one or more of the above 45 locations unless they did not meet the above criteria.

MONITORING SITES

The parameters considered in order to make the recommendations for monitoring sites (i.e., those which would be used in the MSCP Long-term Monitoring Program; LRMP) were discussed at a meeting with representatives of CDFG, USFWS, the City of San Diego and the County of San Diego, on January 27, 2002, at the CDFG San Diego office. It was agreed that the following were important when reviewing each study site as a potential MSCP LRMP site:

- Number of individual raptors documented at a site
- Number of raptor species
- Number of target raptor species
- Diversity of raptors and/or target raptor species
- Number of raptor territories
- Number of crows and/or ravens
- Incidence and/or expectation of management/enforcement problems
- Likely changes in habitat and disturbance over time

In order to identify which sites are the most appropriate for the MSCP LRMP during the breeding season, each site was examined, based on two species diversity parameters (number of total raptors and number of target raptors, both of which were normalized by level of effort) and a third parameter for evenness (Probability of an Interspecific Encounter or PIE; Hurlburt, 1971). The analysis for evenness provided a logical break between the top 19th and 20th sites. All sites were then arranged in descending order for each of these three parameters. If any site came out in the top 19 for any two of the three parameters, it was considered a candidate for the MSCP LRMP. Seventeen sites met this requirement. Each site was reviewed, based on our biological knowledge of that site and how it fit into the geographic distribution of recommended monitoring sites. Finally, juxtaposed sites were combined and sites and site boundaries were adjusted based on historic raptor numbers and improved geographic coverage.



Wildlife Research Institute, Inc.

MSCP RAPTOR STUDY SITE LOCATIONS

Figure 1

Table 1. Raptor Study Sites (2001-2003)

NOTE TO READER: In order to facilitate the reader's access to the following topographic maps, they are listed below alphabetically and by site number.

Number	Name
1	Crestridge
2	Boden Canyon
3	Jamul Ranch
4	SDNWR*/Salt Works/Egger Ghio
5	McGinty Mountain Complex
6	San Diego Bay NWR (winter only)
7	Lake Hodges
8	Penasquitos Lagoon
9	Torrey Pines
10	Sycamore Canyon
11	Iron Mountain
12	Otay Mountain
13	Marron Valley
14	Otay Lakes
15	SDNWR* Sweetwater Marsh
16	San Vicente
17	Sycuan Peak
18	Point Loma
19	North Island
20	Miramar Reservoir
21	Mission Bay
22	Brown Field Complex
23	SDNWR*/San Miguel Mountain
24	Mission Trails
25	Proctor Valley
26	San Diego River
27	Route 67 South
28	San Dieguito Lagoon
29	Route S-6 (deleted/safety issue)
30	Grasslands/Route 67
31	Sloan Canyon
32	Rockwood Canyon
33	Penasquitos Canyon
34	Hollenbeck Canyon
35	Rock Mountain
36	San Pasqual
37	SDNWR*Tijuana Slough
38	Route 94 (North and South)
39	Immenschuh
40	Los Montanas (North)
41	Los Montanas (South)
42	Rancho San Diego (East)
43	Rancho San Diego (West)
44	Border Fields
45	Sweetwater Reservoir

*San Diego National Wildlife Refuge

Name	Number
Boden Canyon	2
Border Fields	44
Brown Field Complex	22
Crestridge	1
Grasslands/Route 67	30
Hollenbeck Canyon	34
Immenschuh	39
Iron Mountain	11
Jamul Ranch	3
Lake Hodges	7
Los Montanas (North)	40
Los Montanas (South)	41
Marron Valley	13
McGinty Mountain Complex	5
Miramar Reservoir	20
Mission Bay	21
Mission Trails	24
North Island	19
Otay Lakes	14
Otay Mountain	12
Penasquitos Canyon	33
Penasquitos Lagoon	8
Point Loma	18
Proctor Valley	25
Rancho San Diego (East)	42
Rancho San Diego (West)	43
Rock Mountain	35
Rockwood Canyon	32
Route 67 South	27
Route 94 (North and South)	38
Route S-6	29
San Diego Bay NWR (winter only)	6
San Diego River	26
San Dieguito Lagoon	28
San Pasqual	36
San Vicente	16
SDNWR* Sweetwater Marsh	15
SDNWR*/Salt Works/Egger Ghio	4
SDNWR*/San Miguel Mountain	23
SDNWR*Tijuana Slough	37
Sloan Canyon	31
Sweetwater Reservoir	45
Sycamore Canyon	10
Sycuan Peak	17
Torrey Pines	9

After completing the above analysis, it became clear that the coastal portions of the MSCP were excluded from the proposed breeding season monitoring because the vast majority and greatest diversity of raptor species breed somewhat inland of the coast. In addition, our data showed that the MSCP area supported a sizable wintering PF population, most of which would be excluded without a coastal component to the MSCP LRMP. Therefore, a winter monitoring route was established that included a good sampling of the coastal wintering raptor habitat that could be driven safely and consistently.

FIELD SURVEYS

By way of clarification, we will be discussing two kinds of raptor searching and documentation. The first is the *survey*—the approach we took to investigate each of the 45 study sites, some of which we are recommending for the MSCP LRMP. This approach utilized several techniques in order to capture a maximum amount of raptor data on sites of considerable environmental variation. The second kind of raptor searching and documentation is the *monitoring protocol*, which will be recommended for MSCP LRMP. This was based on which *survey* techniques were most useful, what has become standardized for raptors, and what will meet the objectives of a monitoring program (discussed below).

Based on a review of the MSCP Biological Monitoring Plan, discussions with the Contract Manager, and our knowledge of survey techniques that are widely accepted, we established guidelines for WRI biologists to follow for the breeding and wintering surveys (WRI 2004, Appendices A and B). As discussed in the Year 1 and 2 reports (WRI 2002, 2004), because of latitude, and the resulting mild climate of the MSCP area, raptor nesting activities can start as early as December and run into August. However, wintering raptors are commonly observed in this region December through February, with some remaining (or migrating through) into mid-March. Therefore, we have, somewhat arbitrarily, called field observations made December through February "winter " survey data. However, "breeding" season data are not limited to a specific timeframe, often overlap with the "winter" observation, and are based on observed behavior (e.g., copulation, nest building, incubation, bringing food to the nest, presence of young).

Table 1 provides a reminder of all the sites that were in the original list of those to be examined. One of the objectives of the 2003 fieldwork was to fill in some data gaps. We had difficulty gaining access to one site (San Diego National Wildlife Refuge/San Miguel Mountain, Site 23) because it involved the use of an access across private property. Table 1 does not reflect surveys that were conducted for the GE or numerous surveys conducted by WRI volunteers and cooperators. During this last year of study, we also continued our coordination with individuals responsible for managing the study sites to keep them appraised of project progress, maintain a point of contact, enlist their input, coordinate access, etc.

Although most of the fieldwork was conducted by vehicle and on foot, as described in WRI (2004, Appendices A and B), some observations, which were focused on the GE, were conducted by helicopter (WRI 2005).

RESULTS

LITERATURE REVIEW

The Project Bibliography has been completed (Appendix A); although, we would welcome any additions from those who review it. This bibliography is not intended to be comprehensive but is intended to provide the reader and local resource manager with important references that relate to: (1) relevant natural history of the target raptors; (2) the presence or distribution of the target raptors within the MSCP, and/or (3) survey or monitoring techniques that could be applied to the target raptor resources by land and wildlife managers within the MSCP. It is arranged by sections for each raptor target species, followed by a section on general raptor literature, with a focus on raptor management.

FIELD SURVEYS

The GE and the PF are addressed separately below because they are unique in both their biological status and their potential for being disturbed. The PF was only recently removed from the listing category and the GE has shown a marked (approximately 50 percent), and well-documented, decline in San Diego County.

Golden Eagle

The GE has been reported on separately (WRI 2005) for a number of reasons relating to resource protection. The detailed site-specific maps are provided in that document so that CDFG has the option of distributing those data separate from the other, less sensitive, raptor data depending on the recipient's need to know.

As an overview, however, after 16 years of consistent monitoring, we estimate that thirty one (31) pairs formerly occupied the San Diego MSCP. Today, fifteen (15) pairs are still active and sixteen (16) pairs have been extirpated. Most of these extirpations occurred in the last 35 years. The fifteen (15) breeding pairs of Golden Eagles remaining in the SD MSCP represent 30 percent of all the breeding Golden Eagles in San Diego County. Seven (7) of the fifteen (15) remaining active pairs within the SD MSCP are in serious jeopardy of being extirpated in the next 5-10 years. Three (3) of the seven (7) pairs predicted to become extirpated may, in fact, already be lost.

The first changes of significance that affected the SD MSCP Golden Eagle population were from intensive agriculture such as avocado and citrus groves. This agriculture replaced cattle grazing and grasslands. Some extirpations were documented to occur in San Diego County in the 1950s and 1960s, after the build-up of military personnel post-WWII, but most disappeared after the 1970s, when major freeways opened land for development that was formerly cattle ranches. Interstate and local freeways made access easy and allowed development to proceed.

Extirpated Golden Eagle territories were primarily located on private land (56 percent). Currently only three (20 percent) of the remaining pairs of Golden Eagles core nesting areas remain on private lands. Twelve (80 percent) of the currently active Golden Eagles within the SD MSCP nest on public land. *This is a significant and valuable opportunity for the future management and survival of Golden Eagles within the SD MSCP.*

In order to properly manage this far-ranging species, specific information about their ecological needs is required, including the limits of the core area around the nest, the primary foraging areas, and the limits of the defendable territory. These are provided in the Golden Eagle report (WRI 2005).

Peregrine Falcon

Breeding Season Results

Of the 12 current and/or historic PF territories known for the county, nine were (and, in five cases, are) located within the MSCP boundaries. Of the five territories located within the MSCP, only one territory is located at one of the study sites (Point Loma, Site 18; see Table 2). The status of that territory and others that we are aware of, within the MSCP, is as follows: Point Loma—active (likely produced young, 2002; was active, 2003); downtown San Diego—active (nest success not known, 2001-2003); La Jolla Cove—active (thought to have produced young, 2002); La Jolla Cliffs—active (nest success not known, 2001-2003); Downtown El Cajon—active (2002) but nest success not known.

Winter Results

A total of 14 PFs were documented during the winter months of 2002 and we believe this was typical for the study period (2001-2003). These were observed at ten study sites (Table 3). One individual was observed at each of nine sites, 2 at one site, and 3 were noted at, or near, another site (Point Loma; site 18). Most birds were observed along the coast or associated with large bodies of water, where shorebirds and other water-associated birds were abundant. Based on other observations, and input from knowledgeable raptor biologists, it is likely that there were roughly 20 PFs wintering in San Diego County during each of the period 2001-2003.

Other Raptors

Breeding Raptors

The raptor breeding season data, by study site, presented in Table 2 and Appendix B provides a picture of what each of the study sites can be expected to support under conditions of average-to-poor precipitation. Maps of all 45 study sites are provided. In cases where no data were collected, or data were combined between two sites, a note on the map provides that explanation. During the period 2001-2003, we examined 44 out of 45 sites (land access was not possible at SDNWR/San Miguel Mountain, Site 23 although we were able to survey a nearby GE nest by helicopter). We documented a total of 15 raptor species and 539 raptor breeding territories (excluding the CR but including 78 stick nests, which we could not positively identify as to raptor species). Of the 539 raptor breeding territories, 96 were target species (all but the BE, SH, and FH, which do not, currently, breed in the MSCP area). Sites varied greatly in their ability to support breeding raptors. Some sites didn't support more than one or two territories, while, others, like the Ramona Grasslands, supported almost 90 territories. Four sites supported no breeding raptors (see those with note "NBR"), while one site (Ramona Grasslands) supported 9 raptor species, including three target species.

The RT was the most commonly documented nesting raptor species, with a total of 177 nests and/or territories located on 34 sites. The next most commonly documented raptor

TABLE 2. Number of Raptor Nests and/or Territories by Site (2001-2003)

		SPECIES**																			Stick	Target	Total	Notes	Site
	SITE	AK	BE	BR	BO	CH	CR	FH	GE	GO	LO	NH	OS	PF	RS	RT	SO	SH	TV	WK	Nest	Spp.	Spp.		No.
1	Crestridge	1				1	2								3	2						1	9		1
2	Boden Canyon					2									2	2						2	6		2
3	Jamul Ranch					2	2			1					1	13				2	15	2	36		3
4	SDNWR*/Salt Works/Egger Ghio																					0	0	NBR	4
5	McGinty Mountain Complex					1									1	5						1	7		5
6	San Diego Bay NWR			1			1									1					2	0	5	Note 1	6
7	Lake Hodges	1		2		2	1		1	2					5	8				1		3	23		7
8	Penasquitos Lagoon																					0	0	Note 5	8
9	Torrey Pines						6									1						0	7	Note 5	9
10	Sycamore Canyon			1							3				1	1	1					0	7		10
11	Iron Mountain			2		4	1		1	1			1		11	13			1	2		5	37	Note 2	11
12	Otay Mountain						2		2						1	5					1	2	11		12
13	Marron Valley						2		1							6					10	1	19		13
14	Otay Lakes	1				2	2			1		2				4				1	4	4	17		14
15	SDNWR* Sweetwater Marsh											2				1						2	3	NBR	15
16	San Vicente								1				3			2			2			1	8		16
17	Sycuan Peak																					0	0	NBR	17
18	Point Loma													1		1						1	2		18
19	North Island				6								1			1					1	6	9		19
20	Miramar Reservoir					1							1			1						1	3		20
21	Mission Bay																					0	0	NBR	21
22	Brown Field Complex	1			4		1					1				5					1	5	13		22
23	SDNWR*/San Miguel Mountain								1													1	1	NSC	23
24	Mission Trails					1									1	2				1	1	1	6		24
25	Proctor Valley	3				1										3					1	1	8		25
26	San Diego River	1				3	1		1	1					3	9						4	19		26
27	Route 67 South/Iron Mtn #11																					0	0	Note 2	27
28	San Dieguito Lagoon											1				4				1		1	6		28
29	Route S-6																					0	0	Note 4	29
30	Grasslands/Route 67	10			1	1	1		1	6					25	41			1	3		3	90		30
31	Sloan Canyon						7		1						2	4				1	2	1	17		31
32	Rockwood Canyon					1	1		1						1	4						2	8		32
33	Penasquitos Canyon	3		2		7	1			2		2			9	4			1	6		9	37		33
34	Hollenbeck Canyon	4				1	4					2			2	4				1	4	3	22		34
35	Rock Mountain						1		1						1	2						1	5		35
36	San Pasqual	1		4		2	2			3					9	16			1	2	7	2	47		36
37	SDNWR*Tijuana Slough	1										2										2	3		37
38	Route 94 (North and South)																					0	0	Note 3	38
39	Immenschuh					1															1	1	2		39
40	Los Montanas (North)														1	1					1	0	3		40

TABLE 2. Number of Raptor Nests and/or Territories by Site (2001-2003)

		SPECIES**																			Stick	Target	Total	Notes	Site
	SITE	AK	BE	BR	BO	CH	CR	FH	GE	GO	LO	NH	OS	PF	RS	RT	SO	SH	TV	WK	Nest	Spp.	Spp.		No.
41	Los Montanas (South)															2						0	2		41
42	Rancho San Diego (East)	1				1										3				1	5	1	11		42
43	Rancho San Diego (West)					2									1						8	2	11		43
44	Border Fields	1		2		6				1		13			2	1				2	12	19	40		44
45	Sweetwater Reservoir					5	3			2					1	5				1	2	5	19		45
Total		29	0	14	11	47	41	0	12	20	3	25	6	1	83	177	1	0	6	25	78	96	579		

* San Diego National Wildlife Refuge.
NBR No breeding raptors observed.
NSC No formal raptor surveys conducted (see notes on topo report maps).
(1) Breeding raptors and ravens observed in residential areas to east of study area.
(2) Data for Route 67 South (# 27) and Iron Mountain (#11) were combined. See Iron Mountain (#11)).
(3) The Route 94 transect overlaps other study sites. Data from this transect were assigned to other appropriate sites.
(4) No data collected due to safety and access issues.
(5) Data for Penasquitos Canyon (#8) combined with Torrey Pines (#9). See Torrey Pines (#9).

**Specie:

AC American Crow
AK American Kestrel
BE Bald Eagle
BH Black Hawk
BR Barn Owl
BO Burrowing Owl
CH Cooper's Hawk
CR Common Raven
FH Ferruginous Hawk
GE Golden Eagle
GO Great-horned Owl
HH Harris' Hawk
LO Long-eared Owl
MR Merlin
NH Northern Harrier
OS Osprey
PF Peregrine Falcon
PR Prairie Falcon
RS Red-shouldered Hawk
RT Red-tailed Hawk
SO Screech Owl
SS Sharp-shinned Hawk
SH Swainson's Hawk
TV Turkey Vulture
WK White-tailed Kite

Table 3. Number* of raptors observed during the winter (primarily January, February, and December) surveys--2001-2003.

		SPECIES***																						Total	Total	Notes	Site
SITE		AK	BE	BR	BO	CH	CR	FH	GE	GO	LO	MR	NH	OS	PF	PR	RS	RT	SO	SS	SH	TV	WK	Target Spp.	Raptors		No.
1	Crestridge					1	19										3	4				1		1	28		1
2	Boden Canyon					2			2								2	6				3		4	15		2
3	Jamul Ranch	5					6						1					7						1	19		3
4	SDNWR*/Salt Works/Egger Ghio	2				1	2	1				1	4	3	1			4					1	7	20		4
5	McGinty Mountain Complex						2										2	5						0	9		5
6	San Diego Bay NWR	3					1	1					1	1	1									3	8		6
7	Lake Hodges	5		4		3	2		2	2			1	2	1		8	36				2	3	7	71		7
8	Penasquitos Lagoon																							0	0	Note 1	8
9	Torrey Pines						12								2			2						2	16	Note 1	9
10	Sycamore Canyon			2							6						2	2	2					0	14		10
11	Iron Mountain			4		8	2		1	2				2			22	18				2	4	9	65	Note 2	11
12	Otay Mountain	2					18		1				1					5						2	27		12
13	Marron Valley	1				1	14										1	6				1		1	24		13
14	Otay Lakes	5				3	10						2	2	1		1	5				1		6	30		14
15	SDNWR* Sweetwater Marsh	2				1	1					1	3	1				5					1	4	15		15
16	San Vicente																	4					2	0	6		16
17	Sycuan Peak																							0	0	Note 3	17
18	Point Loma	1				1	3								3			3						4	11	Note 4	18
19	North Island	2			3		6							2				3						3	16	Notes 3 & 5	19
20	Miramar Reservoir					2								2				2				2		2	8		20
21	Mission Bay	2					2											2						0	6		21
22	Brown Field Complex	4			3	1	8						4					7					2	8	29		22
23	SDNWR*/San Miguel Mountain																							0	0	NWC	23
24	Mission Trails	1				2	6										3	3				1	2	2	18		24
25	Proctor Valley	3				1	132								1			8						2	145		25
26	San Diego River	5				6	2			2			1	1			7	22					2	7	48		26
27	Route 67 South/Iron Mtn #11																							0	0	Note 2	27
28	San Dieguito Lagoon												2					8					2	2	12		28
29	Route S-6	2																2						0	4	Note 4	29
30	Grasslands/Route 67	7			2	1	3	9	3	6		1		1	1		4	12		1		40		16	91		30
31	Sloan Canyon						5		1								2	1						1	9	Note 3	31
32	Rockwood Canyon					2	2		2									6						4	12		32
33	Penasquitos Canyon	6		4		14	2		4				4	2			18	8				2	12	22	76		33
34	Hollenbeck Canyon	7				1	13		2				3			1	3	5						6	35		34
35	Rock Mountain								3															3	3		35
36	San Pasqual	11		7		2	6		2	6			1		1		16	57		1		3	8	6	121		36
37	SDNWR*Tijuana Slough	3				1	4		1			1	2	1	1			4						5	18		37
38	Route 94 (North and South)																							0	0	Note 6	38
39	Immenschuh					1																		1	1		39
40	Los Montanas (North)																	3						0	3		40
41	Los Montanas (South)						4											3						0	7		41
42	Rancho San Diego (East)	2				3	6											4					1	3	16		42
43	Rancho San Diego (West)						3											1						0	4		43
44	Border Fields	8											6				1	13					3	6	31		44

Table 3. Number* of raptors observed during the winter (primarily January, February, and December) surveys--2001-2003.

45	Sweetwater Reservoir	9	2			3	38			2		1		1	1			5				1	1	6	64		45
Total		98	2	21	8	61	334	11	24	20	6	5	36	21	14	1	95	291	2	2	0	59	44	156	1155		

* Numbers refer to maximum number of birds observed.

** San Diego National Wildlife Refuge.

(1) Data for Penasquitos Lagoon (#8) and Torrey Pines (#9) combined. See Torrey Pines (#9).

(2) Data for Route 67 South (# 27) and Iron Mountain (#11) were combined. See Iron Mountain (#11)).

(3) Includes March survey.

(4) Two PFs were observed to the north of this site, near the S.D. Airport.

(5) Seven widely-spaced active burrows suggested that there were at least seven BOs on this study site.

(6) The Route 94 transect overlaps other study sites. Data from this transect were assigned to other appropriate sites.

***Species

AK American Kestrel
BE Bald Eagle
BR Barn Owl
BO Burrowing Owl
CH Cooper's Hawk
CR Common Raven
FH Ferruginous Hawk
GE Golden Eagle
GO Great-horned Owl
LO Long-eared Owl
MR Merlin
NH Northern Harrier
OS Osprey
PF Peregrine Falcon
PR Prairie Falcon
RS Red-shouldered Hawk
RT Red-tailed Hawk
SO Screech Owl
SS Sharp-shinned Hawk
SH Swainson's Hawk
TV Turkey Vulture
WK White-tailed Kite

nests/territories were those of the RS with 83 and the CH with 47. The CR (a non-raptor, but a species that can have an impact on raptors) was fourth in frequency with 41 nests/territories. The next level of frequency was shared by AK (29), NH (25), WK (25), and GO (20). To a great extent, this frequency distribution is a function of site size, amount of appropriate habitat, and sometimes local conditions on the respective sites.

Of the eight project target species, nesting was documented for five—CH, NH, GE, BO, and, PF. CH nesting was observed at the highest number of study sites, with nests and/or territories documented at 21 sites (48 percent of the 44 sites surveyed). GE was observed nesting at 11 sites (25 percent); while NH was documented at only 8 sites (18 percent) with 13 of the 25 territories found at Border Fields. BO were found nesting at only 3 (7 percent) of the sites and PF at only 1 (0.23 percent) of the sites.

The CH nested, primarily, at those sites that contain healthy riparian habitat; however, this species has become somewhat of a generalist and also nests elsewhere (see Discussion). GEs limited their nesting to sites with sheer cliffs away from human activity and close to nearby grasslands for hunting (see below). The NH and the PF were concentrated primarily along the coast. However, one PF pair attempted nesting in downtown El Cajon and a few scattered NHs were observed nesting at more inland sites. NHs nested in mostly coastal marsh and open field habitat; although we have observed NHs nesting in ruderal areas (J. Oakley, pers. comm.). PFs utilized mostly man-made structures, along the coast, with nearby sources of shorebirds and other prey. Most of BOs, located on the study sites, were found in sandy soil with low grass and open areas (see also WRI 2003, Lincer and Bloom 2003, in prep.). BE and FH winter within the MSCP but are not known to breed there. SHs only pass through during migration, are infrequently documented, and when they are, they are usually not within the MSCP. Some of the SH migrants seen are in the Ramona area and large numbers (over 5,200) have been recently documented migrating along the desert front to the east of the MSCP during the spring (Unitt 2004).

Based on the number of *all* nesting raptor species (plus the CR) and all the sites surveyed during the 2001-2003 breeding seasons, Site 30 (Ramona Grasslands/Route 67) contained the most nests/territories of all sites surveyed. Eighty-nine nests/territories were documented, representing nine raptor species (and 1 CR). The site to show the next highest number of territories was San Pasqual (Site 36) with 47 territories (including two CR and 7 unidentified stick nests that were not duplications of known territories). Border Fields State Park (Site 44) showed the next highest number of territories with 40 territories (including 12 non-duplicative unidentified stick nests).

Site 44 (Border Fields) contained the highest number of *target* species nests/territories of all sites surveyed (19). Penasquitos Canyon (Site 33) supported 9 target species territories while North Island (Site 19) supported 6 and Brown Field Complex (Site 22) and Iron Mountain (Site 11) tied, with both supporting 5 nests of the target raptor species.

Wintering Raptors

A total of 20 raptor species were documented on our study sites during the winter months (January, February, and December) of 2001-2003 (Table 3). Of course, at San Diego's latitude, a number of the resident breeders are actively nesting while many of the wintering birds are still on site. All target raptors, but the SH, were documented during the winter observation period (December-February). Numbers ranged from 0 to 22 individual target raptors per site for a total of 154 individuals for all study sites. Comparable numbers for all raptors (plus the Common Raven) were 0 to 145 as a range. A total of 1,153 wintering individuals were documented (or 819, without the ravens).

The CR was, clearly, the most common wintering bird of those surveyed for. The three most commonly documented wintering raptors were the RT, AK, and RS, with totals of 291, 98, and 95, respectively. Of those sites surveyed in this study, the following held the highest number of wintering individuals (raptors and ravens): Site 25 (Proctor Valley) – 145, Site 36 (San Pasqual) – 121, Site 30 (Ramona Grasslands) – 91 (which included 9-16 FHs; with 20 documented in 2005), Site 33 (Penasquitos Canyon) – 76, and Site 7 (Lake Hodges) – 71.

DISCUSSION

Weather as a Factor

In reviewing any body of data, it is important to consider how typical the sampling period was. So just how "typical" were 2001 through 2003? Drought plays a significant factor in the density and reproductive success of raptors and other predators. During the El Nino of 1998/99, NHs were breeding in areas where they have not bred since and in lower numbers in other locations. The demonstrable impacts of drought on GEs and Prairie Falcons, throughout southern California, were presented by Bittner et al. (2003). This study was conducted during the worst drought for San Diego in 160 years. This should be noted for future researchers.

Management and Enforcement Issues

Table 4 is a summary of management and enforcement issues by site. Clearly, some study sites are substantially impacted, either directly or indirectly, by human activities. Some sites are currently without major impacts. Unfortunately, many of the more diverse and potentially productive sites are the same ones that are experiencing multiple management and enforcement challenges. Of those that are obviously impacted, the following activities are the most common: humans walking or hiking (36 out of 45 sites or 80%) and pets, primarily dogs being allowed to run free, (26 out of 45 sites or 57 %).

Table 4. Management Enforcement Issues Identified by Raptor Study Site

Site No.	Name	Humans Walking/Hiking	Rock Climbing	Off-road Vehicle Use	Pets	Disking, etc. Agricultural Activities	Rodent/Ground Squirrel Poisoning	Construction/Development	Newly-developed Access Road(s)	Other
1	Crestridge	X								
2	Boden Canyon	X		X	X				X	6
3	Jamul Ranch									6?
4	SDNWR*/Salt Works	X								
5	McGinty Mountain Complex			X	X					
6	San Diego Bay NWR	X			X					
7	Lake Hodges	X	X	X	X			X	X	6
8	Penasquitos Lagoon	X			X					
9	Torrey Pines	X			X					7
10	Sycamore Canyon	X		X	X				X	
11	Iron Mountain	X	X	X	X				X	
12	Otay Mountain	?	X	X						1
13	Marron Valley	X	X	X	X					1
14	Otay Lakes	X			?				X	8
15	SDNWR* Sweetwater Marsh	X		X	X					
16	San Vicente	X	X		X				X	
17	Sycuan Peak									
18	Point Loma	X								
19	North Island	X								2
20	Miramar Reservoir	X						X		
21	Mission Bay	X		X	X			X		
22	Brown Field Complex	X		X	X			X		1,3,4
23	SDNWR*/San Miguel Mountain	X		X	X				X	
24	Mission Trails	X	X		X					
25	Proctor Valley	X		X	X		X	X		
26	San Diego River	X	X		X		X			7
27	Route 67 South	X		X				X	X	
28	San Dieguito Lagoon	X				X		X		
29	Route S-6	X						X		
30	Grasslands/Route 67	X	X		X	X	X	X	X	
31	Sloan Canyon	X			X					
32	Rockwood Canyon	X	X					X		
33	Penasquitos Canyon	X		X	X				X	
34	Hollenbeck Canyon									6
35	Rock Mountain	X	X							5
36	San Pasqual	X		X	X	X	X	X		5
37	SDNWR*Tijuana Slough	X		X	X	X	?			

Table 4. Management Enforcement Issues Identified by Raptor Study Site

38	Route 94 (North and South)									
39	Immenschuh									
40	Los Montanas (North)									
41	Los Montanas (South)									
42	Rancho San Diego (East)	X			X					
43	Rancho San Diego (West)	X			X					
44	Border Fields	X			X					1
45	Sweetwater Reservoir									

*San Diego National Wildlife Refuge

(1) Border Patrol and illegal alien activities.
(2) Conflicts with Navy goals and endangered species recovery program.
(3) Potential conflict with future Navy goals at Satellite Surveillance Station.
(4) Heavy predation by Coyotes and Barn owls.
(5) Future threats from proposed trail construction and associated access to rock climbers, ORVs, etc. activities.
(6) Shooting (legal and illegal).
(7) Paragliding.
(8) Cattle grazing.

Management Conflicts

The following are observed management conflicts, which lead to our recommended management and research (see Recommendations):

- As indicated above, human uses [rock-climbing, hiking, jogging, walking dogs (often without leashes), vehicular use, etc.] impact the normal behavior of raptors (and other wildlife).
- In many cases, the size of protected parcels is substantially smaller than that required by a raptor's functional territory, including foraging areas.
- The public/political pressure to create new trails into MSCP preserve lands provides a path for, and encourages, increased disturbance to raptors (and other wildlife).
- The public/political perception that MSCP preserve lands have been created primarily for active, and in some cases, consumptive, recreation, sets up an obvious conflict for managing raptors (and other wildlife).
- The constraint of using fire as a management tool in proximity to human habitation limits habitat management tools.
- Inadequate funding to both acquire important lands and properly manage MSCP lands which are acquired.

Raptor Monitoring

The following is a reiteration of considerations, regarding the MSCP Long-term Raptor Monitoring Program, that were presented previously (WRI 2004) and discussed elsewhere (Lincer and Bittner 2002; Lincer et al. 2003). For further reading, relevant issues are proposed and discussed by Oakley, Thomas, and Fancy (2003).

Sample Design

The ideal sample design should be:

1. Representative of the study area and the issues at hand. (e.g., habitat loss, disturbance, etc.) ;
2. Representative of the habitats of interest and the seasons during which those habitat support the monitored species (e.g., the MSCP not only provides important breeding habitat for numerous raptor but it is also a significant habitat for several wintering raptors, including some that are considered target raptors, like the PF, BE, FH, and BO);
3. Inclusive of all focus species or represent them in some functional way;
4. Sensitive to the objectives of the MSCP monitoring requirements;
5. Sensitive to logistics;
6. Statistically appropriate (which may be compromised by above logistics);
7. Able to predict, and take into consideration, *detectability* (i.e., how counts relate to the actual number of raptors in the sampled area; one approach is to use a "double count" approach). This objective may also be compromised by above logistics.

Questions to be Answered and Objectives to be Met

How will the data be used by the various management entities? When do they need what? An example of a clear monitoring objective would be, "Be able to detect a 25% change in population (individual species or overall raptor group?), in each chosen habitat, in 10 years." This is the approach that is being attempted by NARMS (North American Monitoring Strategy) but some of the best raptor monitoring minds are having a serious challenge addressing these objectives. It is entirely possible that we won't have enough observations for some species to detect a significant change in a timely manner.

Possible Monitoring Approaches

Levels of effort and agency *commitment* are, integrally tied. For instance, the MSCP program could adopt a:

1. Highly rigorous, scientific approach that would be costly but could withstand the most challenging statistical/legal tests, or
2. More practical, less expensive approach that would be more likely to be funded, and therefore carried out, but would stand the chance of being successfully, challenged at some time in the future.

As to *which, and how many, species* should be involved, the program could use a:

1. Multiple species approach, using selective target species only,
2. Multiple species approach, using selective target species, but recording all raptors (and ravens) observed,
3. Single species approach, using a keystone species, like the Golden Eagle or
4. Combination of the above.

Target Species and Other Multiple Species Approaches

A monitoring approach that focuses on one or more so-called "target" species has the appeal of apparent simplicity and the implication that these target species will, somehow, reflect a broader suite of species and be sensitive to whatever perturbations are experienced. Having surveyed raptors for many years, it is apparent that each species often responds to similar impacts differently. Although GOs and RTs might show similar population changes in response to small mammal population changes, and most raptors will show some response to a record-breaking drought, such as we have just experienced, there are likely more differences than similarities between species. Those differences are not only in *degree* but also in *direction*. For instance, GEs and PRs responded to the recent drought to different degrees (Bittner et al. 2003), with the PR being less impacted by presumed small mammal population decreases because it takes a wider range of prey species than the GE, which is heavily dependent on jackrabbit and ground squirrel populations. In addition, some raptors (e.g., GE) are far more negatively responsive to human activity than others (e.g., AKs, RTs, RSs, and some CHs). There are also differences in response, both within and between species, depending on the time of year (e.g., during the

breeding season vs. the wintering season) and where a disturbance occurs (e.g., on the hunting grounds or within the nest territory).

Regarding raptors responding in a different direction, one only needs to recognize that many different raptors require different habitats and, although not many species will persist if usable habitat is replaced with a development (although some CHs and RSs may defy this simplification), a conversion from one habitat/land use to another will often affect different species in different ways. For instance, if an extensive riparian habitat were to be replaced by an agricultural land use, and some hedge rows were to be left/created, we could expect that there would be a decrease in RSs, CHs, and several owl species. But, at the same time, there would likely be an increase in AKs, RTs, and perhaps WKs.

The point to the above exercise is that, if an arbitrary few species are chosen as "target" species, and the other raptors are not monitored, there will be a good chance that only some kinds of impacts will be reflected in the population trends of those raptors monitored. In our opinion, the MSCP Long-term Monitoring Program should include a broad-based approach, which documents all raptors observed and uses observed changes/trends to identify appropriate adaptive management strategies.

Single Species Monitoring Approach

Having sung the praises of a multiple raptor species approach (above), there is at least one raptor species in the western United States that has the ability to reflect regional trends in environmental health. This is the Golden Eagle. The attraction of using the GE, as a regional "miner's canary," is that (1) it requires a reasonably large and intact territory, and (2) there exists, in San Diego County, a unique and relevant historical regional database for this species. The Wildlife Research Institute has a long history of investigating the historical presence of GE in southern California, which includes the MSCP and environs (Bittner and Oakley 1999; WRI 2005). This collection of records has been compiled to reflect past documentation of GE pairs, their nesting success, hunting territories, and numbers of egg and /or young. The WRI database includes both active and extirpated territories beginning with records as early as 1864. WRI became involved in 1987 with the start of the San Diego GE Project (see Discussion in WRI 2005). *This project, in total, represents the longest such study of any eagle population in the Western Hemisphere, and is the second to longest in the world, next to one study in Switzerland.*

Providing this historical information, in conjunction with current trend data, is critical to managing the GE into the future. Only if we understand the extant population (within the context of the historical variation) can we properly evaluate the population and meet the needs of the species under current and future changing environmental and land-use conditions. If this is accomplished, it will reflect the success of the MSCP program.

RECOMMENDATIONS

Long-term MSCP Raptor Monitoring

Long-term monitoring is recommended under three categories: (1) Breeding Season, (2) Winter Season, and (3) Single Species Monitoring Program.

Breeding Season Monitoring Program

Twelve areas are recommended for breeding season portion of a Long-term Raptor Monitoring Program (Figure 2 and Table 5). Each Raptor Monitoring Area (RMA) consists of one to four of the individual raptor study sites that were surveyed during the period 2001-2003, the analysis of which led up to these recommendations. The choices of RMAs were based on a number of biological parameters (e.g., raptor diversity and population parameters, known history of raptor use), logistical considerations (how a monitor would move efficiently through a monitoring area), and a reasonable geographic coverage of the MSCP study area (see Methods). The Breeding Season Monitoring Program should, initially, be conducted every two years and encompass all 12 RMAs each time (i.e., don't conduct different portions of the total every other year). After a maximum of 5 monitoring events (i.e., 10 years), a statistical trend analysis should be conducted to determine if the frequency of every two years is adequate or, perhaps, unnecessarily frequent. Depending on the data, it may make sense to conduct this analysis earlier.

Raptor monitoring for the Breeding Season Monitoring Program should follow the protocol provided in Appendix C. This monitoring should be conducted by qualified raptor biologists with several years of relevant regional experience with the raptors found in the MSCP and proper training in the specific techniques necessary to conduct this monitoring.

Thanks to a grant from the San Diego Foundation, for post- (2003) fire studies, WRI was able to test this monitoring program on seven RMAs, representing varying degrees of being burned:

B. Ramona Grasslands (Control Area)
D. Iron Mountain (Burned)
E. San Diego River (Burned)
F Sloan Canyon (Burned)
H. Proctor Valley (Partially Burned)
I. Rancho Jamul (Partially Burned)
L. Otay Mountain (Burned)

The results of this monitoring effort were reported to the San Diego Natural History Museum (Lincer 2005).

Winter Season Monitoring Program

Because (1) the MSCP provides important wintering grounds for many raptors (some of which are *only* here during the winter), (2) coastal portions of the MSCP are not captured by the above breeding season monitoring approach, and (3) it is important to track at least three raptor species, that are primarily coastal in the MSCP, which have proven to be ideal bioindicators (PF, NH, and Osprey), we recommend conducting a winter monitoring program that focuses on the coastal portions of the MSCP (Figure 3). This, like the Breeding Season Monitoring program, should be conducted every two years (alternating years with the breeding season monitoring would be acceptable). After a maximum of 5 monitoring events (i.e., 10 years), a statistical trend analysis

should be conducted to determine if the frequency of every two years is adequate or, perhaps, unnecessarily frequent. Depending on the data, it may make sense to conduct this analysis earlier.

TABLE 5. Proposed MSCP Areas for Long-term Raptor Monitoring (Breeding Season)

Area	Name	Study Sites* (original number(s)
A	San Pasqual	San Pasqual (36), Lk. Hodges (7), Boden Cyn. (2), Rockwood (32)
B	Ramona Grasslands	Ramona Grasslands (30)
C	Penasquitos Canyon	Penasquitos Canyon (33)
D	Iron Mountain Complex	Iron Mountain**(11), San Vicente (16), Route 67 (27)
E	San Diego River	San Diego River (26)
F	Sloan Canyon	Sloan Canyon (31), McGinty Mtn. North (5), Sycuan Mtn. North (17)
G	Sweetwater River	Sweetwater Reservoir (45), Rcho. S.D. East (42), Rcho. S.D. West (43), San Miguel Mtn. North (23)
H	Proctor Valley	Proctor Valley (25), San Miguel Mtn. South (23), Upper Otay Lk.(14)
I	Rancho Jamul	Jamul Ranch (3), Hollenbeck Canyon (34)
J	Border Fields	Border Fields (44), Tijuana River (part)
K	Brown Field Complex	Brown Field (22), Otay River, Spring Cyn. (part), Dennery Cyn. (part)
L	Otay Mountain	Otay Mountain (12), Marron Valley (13), Lower Otay Lake (14)

* In some cases, only a portion of a study site is included because of access, visibility, or some other reason (see detailed maps, Appendix C, for details).
** Including Monte Vista Ranch.

Raptor monitoring for the Winter Season Monitoring Program should follow the protocol provided in Appendix C. This monitoring should be conducted from a vehicle, following the route depicted by Figure 3, and be conducted by qualified raptor biologists with several years of relevant regional experience with the raptors found in the MSCP.

Single Species Program

For the reasons covered in the Discussion section, we recommend that the GE (breeding season only) be used for the Single Species Program. Because of the dynamic nature of the GE pairs and the use of their territory, including their primary foraging area, these surveys should be conducted *every year* as they have been by WRI's biologists for the last 16 years. GE monitoring should follow the protocol that has been used for the San Diego GE Study for the last 16 years (Bittner and Oakley 1999, WRI 2005). WRI (2005) provides the details of both the breeding history of the GEs in the MSCP and recommendations on monitoring and future research. WRI (2005) is provided as a separate report for the protection and proper management of the GE. As an overview, observations must begin in December and go through June of each year. GEs begin courtship and nest building in December and January. They lay eggs in February and early March, hatch young in late March and April and fledge young in May and June. Therefore, it is essential that monitoring biologists be in the field for critical portions of the entire season (six months) to obtain all the data needed to monitor the GE population properly.

Aerial surveys have been a crucial part of the current study providing new insight into once-difficult areas to investigate potential territories. Patagial tags (and soon radio transmitters) placed on the GE's wings are now also an integral part of the eagle tracking process. Territory

Fig. 2. Prop'd RMAs (breeding)

Contact WRI for maps

integrity is fairly well documented in the San Diego MSCP and is being refined. See MSCP (2005) for more details.

Consistency in Monitoring

If data to be collected for this, or *any* monitoring program, are to have any utility in showing trends, they must be collected in a consistent fashion. As discussed above, the areas and routes to be monitored should be monitored frequently enough to reveal a complete picture of what is breeding and wintering on those respective areas and routes but these data are only a *sampling* of the entire MSCP. Therefore, it is extremely important that monitoring protocol is consistent both between sites/areas and over time (i.e., between years). To do this, a significant effort will have to go into selecting qualified raptor biologists, making sure that they are familiar with the required protocol, geography and species, and ensuring consistency between sites and years.

Other Recommendations

Management Needs and Enhancement Opportunities

- Restriction of inappropriate human activities where they are in conflict with, especially nesting, raptors.
- Apply the lessons learned in the development of the MSCP to the North and East County MSCPs and other HCPs.
- Develop a comprehensive management plan for the dwindling Burrowing Owl population within the MSCP.
- Selectively install artificial burrows, for BOs, and nest boxes for AKs, BRs, and Screech Owls (SOs). Keep in mind that BRs are an effective predator on not only small mammals but also medium size raptors, like the BO.
- Consider the use of grazing and/or fire as appropriate management tools to maintain grasslands, maintain/improve biological diversity, and manage fire fuel loading.

Recommended Research

- Transmitter study to better define the use of MSCP lands by GEs (initial studies in progress).
- Investigate the feasibility of reintroducing SHs into historical sites within the MSCP.
- Investigate the most efficient approaches to captive rearing and hacking BOs into appropriate habitat (either as is or as it can be modified and managed) within the MSCP.
- In order to prioritize the management of raptors that winter within the MSCP, but breed elsewhere (e.g., FH, MR, OS, BE, and some of the WK), determine the natal areas for these birds. If the natal areas have substantial threats, then no amount of MSCP management will have substantial positive impact.
- Document the growing OS population and determine emigration and immigration.
- Document the presence of, and habitat use by, crepuscular (BO) and nocturnal raptors (e.g., BR, SO, GO, Long-eared Owl).
- Document the recovery of raptors after the November 2003 fires and apply findings to future management strategies.

Fig. 3. Prop'd Winter Monit. Areas.

Contact WRI for Maps

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APPENDIX B

BREEDING SEASON RAPTOR NESTS AND TERRITORIES BY SITE (2001-2003)

The following pages reflect raptor breeding territories which were typical of the below study sites for the period 2001-2003. To facilitate the reader's access to the following topographic maps, they are listed below alphabetically and by site number.

Number	Name	Name	Number
1	Crestridge	Boden Canyon	2
2	Boden Canyon	Border Fields	44
3	Jamul Ranch	Brown Field Complex	22
4	SDNWR*/Salt Works/Egger Ghio	Crestridge	1
5	McGinty Mountain Complex	Grasslands/Route 67	30
6	San Diego Bay NWR (winter only)	Hollenbeck Canyon	34
7	Lake Hodges	Immenschuh	39
8	Penasquitos Lagoon	Iron Mountain	11
9	Torrey Pines	Jamul Ranch	3
10	Sycamore Canyon	Lake Hodges	7
11	Iron Mountain	Los Montanas (North)	40
12	Otay Mountain	Los Montanas (South)	41
13	Marron Valley	Marron Valley	13
14	Otay Lakes	McGinty Mountain Complex	5
15	SDNWR* Sweetwater Marsh	Miramar Reservoir	20
16	San Vicente	Mission Bay	21
17	Sycuan Peak	Mission Trails	24
18	Point Loma	North Island	19
19	North Island	Otay Lakes	14
20	Miramar Reservoir	Otay Mountain	12
21	Mission Bay	Penasquitos Canyon	33
22	Brown Field Complex	Penasquitos Lagoon	8
23	SDNWR*/San Miguel Mountain	Point Loma	18
24	Mission Trails	Proctor Valley	25
25	Proctor Valley	Rancho San Diego (East)	42
26	San Diego River	Rancho San Diego (West)	43
27	Route 67 South	Rock Mountain	35
28	San Dieguito Lagoon	Rockwood Canyon	32
29	Route S-6 (deleted/safety issue)	Route 67 South	27
30	Grasslands/Route 67	Route 94 (North and South)	38
31	Sloan Canyon	Route S-6 (deleted/safety issue)	29
32	Rockwood Canyon	San Diego Bay NWR (winter only)	6
33	Penasquitos Canyon	San Diego River	26
34	Hollenbeck Canyon	San Dieguito Lagoon	28
35	Rock Mountain	San Pasqual	36
36	San Pasqual	San Vicente	16
37	SDNWR*Tijuana Slough	SDNWR* Sweetwater Marsh	15
38	Route 94 (North and South)	SDNWR*/Salt Works/Egger Ghio	4
39	Immenschuh	SDNWR*/San Miguel Mountain	23
40	Los Montanas (North)	SDNWR*Tijuana Slough	37
41	Los Montanas (South)	Sloan Canyon	31
42	Rancho San Diego (East)	Sweetwater Reservoir	45
43	Rancho San Diego (West)	Sycamore Canyon	10
44	Border Fields	Sycuan Peak	17
45	Sweetwater Reservoir	Torrey Pines	9

*San Diego National Wildlife Refuge

LEGEND

Symbols

Center of raptor/corvid territory or assumed or documented nest site.

Note: Above symbol without an acronym following it indicates that a stick nest was documented but species was not determinable. If species was known for the nest or territory, the above symbol is followed by the appropriate acronym (see below).

Acronyms for Raptor and Corvid Species

AC	American crow
AK	American kestrel
BE*	**BALD EAGLE**
BH	Black hawk
BR	Barn owl
BO*	**BURROWING OWL**
CH*	**COOPER'S HAWK**
CR	Common raven
FH*	**FERRUGINOUS HAWK**
GE*	**GOLDEN EAGLE**
GO	Great-horned owl
HH	Harris' hawk
LO	Long-eared owl
MR	Merlin
NH*	**NORTHERN HARRIER**
OS	Osprey
PF*	**PEREGRINE FALCON**
PR	Prairie falcon
RS	Red-shouldered hawk
RT	Red-tailed hawk
SE	Short-eared owl
SO	Screech owl
SS	Sharp-shinned hawk
SH*	**SWAINSON'S HAWK**
TV	Turkey vulture
UA	Unidentifiable accipiter
UB	Unidentifiable buteo
UF	Unidentifiable falcon
UR	Unidentifiable raptor
WK	White-tailed kite
WH	White-tailed hawk
ZH	Zone-tailed hawk

* MSCP target species.

APPENDIX C

LONG -TERM RAPTOR MONITORING PROTOCOL

BACKGROUND

The Multiple Species Conservation Program (MSCP) is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple species and the preservation of natural vegetation in San Diego County (County of San Diego 1997). The size and configuration of the preserve network is continually evolving but it may ultimately encompass approximately 172,000 acres. In order to determine if the MSCP or any management area, for that matter, is functioning correctly, a meaningful monitoring plan must be in place. A vast area, such as the MSCP, cannot be comprehensively monitored for any but a few species with very limited and specific habitat requirements. Raptor species will, therefore, be monitored using a reproducible sampling approach. Details of this approach are described below after reminding the reader of the ultimate monitoring objectives.

OBJECTIVES

The overall goal of the MSCP monitoring is to detect changes in habitat quality and population trends in those habitats and species covered by the MSCP (Ogden 1996). Specific objectives, as they relate to raptors, are as follows:

1. Document the protection of target species as specified in subarea plans and implementing agreements.
2. Document changes in preserved populations of covered species.
3. Describe new biological data collected.
4. Evaluate impacts of land uses and construction activities in and adjacent to the preserve.
5. Evaluate management activities and identify enforcement difficulties.

The purpose of this document is to provide guidance for consistency in the approach to surveying for raptors *during the breeding season and during the wintering period.* The below protocol is generic in nature but site-specific details, as to route, viewshed locations, and other important site features, are provided for each Raptor Monitoring Area (RMA) in Appendix C-1.

APPROACH

The following provides methodological details for the professional, with adequate raptor expertise, to conduct the breeding season and wintering period raptor monitoring in a consistent manner. The ability to detect trends (e.g., in raptor numbers, distribution, diversity, etc.) will be extremely important in order that adaptive management decisions be made in a timely manner. If trend analyses are to be interpretable, it is essential that the same locations within the preserve be monitored in a consistent manner. This would best be accomplished if the same individual or team monitored all locations, for all surveys.

ACRONYMS AND DEFINITIONS

Acronyms and definitions are attached (Appendix C-2). Use them consistently in order that there be continuity and clarity in all observations and record keeping.

SPECIES

Although all raptor species will be noted, there are eight MSCP, so-called "target," raptor species: Bald Eagle (BE), Burrowing Owl (BO), Cooper's Hawk (CH), Ferruginous Hawk (FH), Golden Eagle (GE), Northern Harrier (NH), American Peregrine Falcon (PF), and the Swainson's Hawk (SH). Although you will not, necessarily, be searching for the BO at the most desirable time of day (early morning/early evening), any observations of BO or any other raptor species should be documented. Raptors will be the focus of the surveys but any observed sensitive species (regardless of taxa), interesting road kill, unusual biological observation, breeding colony, bird roost site, or other unique resource should also be noted on the WRI "Field Datasheet" (Appendix C-3).

TIMING AND FREQUENCY OF SURVEYS

Although it is common for ornithologists to identify a specific time of year as the "breeding season," it is not possible to specify a timeframe, for our local raptors, that does not overlap with what is considered the wintering period. Because of the latitude of the MSCP, raptors are not restricted to a brief portion of the spring within which to breed. Many of our local raptors start breeding while other wintering and migrating raptors are still in the MSCP study area and environs. Therefore, the time of year that we call the "breeding season" could span December through August but varies considerably by species. Some GEs, for instance, can start nest building as early as December and still have nestlings in that nest as late as June. BOs, on the other hand, can start laying eggs in early April but fledge some young as late as August.

EQUIPMENT/SUPPLIES

Field vehicles should have 4WD capability if terrain requires. Binoculars, a camera, and a spotting scope of sufficient power for raptor observations are required. A magnification of 10X for binoculars and a range of approximately 20-60X for scopes are recommended. A cell phone may be very helpful in some locations, as could a set of "walkie-talkies" if more than one investigator will be in the field at the same time. Bring these survey guidelines, a copy of any authorization letters from resource agencies, any windshield placards (that indicates that you are under contract to conduct these surveys), local and project-generated site maps, and an adequate supply of "Transect Data Sheets" (Appendix C-3). To this, add your standard field equipment and supplies (field guides, hat, water, snacks, etc.). Although observers should be thoroughly familiar with all the local raptors, field guides that should be helpful include the Peterson guide, *Hawks* (Clark and Wheeler 1987) and the accompanying photographic guide (Wheeler and Clark 1999).

WEATHER

Monitoring should be conducted only during certain desirable weather conditions to maximize chances of documenting raptors. Inclement weather (rain, fog, winds greater than 20 mph, etc.) should be avoided. Occasional drizzle and winds up to 20 mph will not normally affect most raptor behavior. Observation in cold or wet weather should be done very carefully or completely discouraged. If an incubating bird is accidentally flushed during surveys, total nest failure could result for that season.

TIME OF DAY

The time of day, during which observations are made, is more important during the breeding season surveys than for the winter surveys (for most raptor species). Monitoring should take place from dawn through 1200, although professional experience may allow for some flexibility. Although BOs are not, necessarily, most active during this timeframe, you may note them and they should be documented as indicated below, as you would any raptor species. Since this is a crepuscular species, however, schedule sites that may support BOs for the early morning and/or early evening, whenever possible, to maximize chances of seeing this crepuscular species.

TWO TYPES OF OBSERVATIONS

Observations will be made two ways: (1) in vehicles, along established routes, and (2) at designated viewshed (i.e., observation) points. In addition, all reliable reports provided by interested individuals and cooperators will be verified and included in the data set but noted as "personal communications" with the appropriate documentation.

Vehicular Transects

Many of the breeding season raptor observations, and all those for the winter period, will be conducted from a vehicle. Therefore, vehicle speed will be an important variable. Speed will vary between road transects, depending on the road conditions, including traffic, and weather. That speed, however, should be consistent (year-to-year) for a particular transect in order that meaningful data comparisons can be made over time. Speed on a busy highway will have to be adequate to safely keep up with traffic. Some highway transects, that were deemed too dangerous, were removed from consideration. On a backcountry road, however, 10 mph may be the right speed. Safety should be the highest priority, and for that reason, an assistant to the driver is recommended to make observations and take notes, especially on busy roads.

Point/View shed Observations

Observation points have been established along some vehicle routes and at other desirable view shed locations for breeding season monitoring (see Appendix C-1). These will be especially important for riparian areas and inaccessible mountainous, and other, areas, where limited vehicle access prevents a reasonable survey of a RMA. At observation points along vehicle routes, a minimum of 10 minutes of actual observation is required. This means allowing whatever time is necessary to stop the vehicle in a safe, repeatable location, get out of the vehicle, and set up equipment (spotting scope, etc.) before starting the formal ten-minute observation (i.e., watching *and* listening). In situations where the observer is driving *through* the relevant habitat, a 5-minute observation period may be adequate. At some viewshed locations (like the top of a mountain), the observation time will be longer (perhaps 30 minutes). The most important issue here is that, once a viewing time period has been established for a particular RMA, it is maintained for consistency each year.

WHAT TO NOTE

All relevant data must be documented (see Transect Data Sheet, Appendix C-3). Sightings for *all* raptors will be documented. Note specific location of the raptor species *the first time it is observed* on each day of observation. Note age, sex, and any unusual plumage (if relevant) and

describe location(s) of any band(s) (metal right or metal left and sequence and numbers of any color bands), transmitter, or patagial wing markers. Avoid duplicate counts by noting unique characteristics of an individual and, when a bird is moving, its direction and relative speed. Record courtship and nesting behavior. If a nest is observed during the "winter" surveys, note its location on the topo map, what species of tree its in, height, size of nest, composition, and whether you consider it active. Indicate the basis for assumed activity (for instance, presence of an adult or pair near the nest, young, recent whitewash or greenery in /around nest).

CONTROL NUMBERING

Each control number for a study site and day of observation will be alphanumeric. For each species observed, the control number will start with the acronym for that species (see Appendix C-2) and be followed by "01." The following control numbers, for that species, will end with 02, 03, etc., in the sequence in which the observations take place. This number is entered on the field data sheet (with all of its associated observations) and on the topo survey map, on which is always placed the survey date and the name(s) of the biologist(s). For instance, if the first observation of the day, at Mission Trails Regional Park, is a RT (Red-tailed Hawk), the control number will be "RT01." The second RT will receive the control number "RT02." If the next observation were a Cooper's Hawk, it would be "CH01." It will simplify records if each Transect Data Sheet and topo map is only used for one day's observation at each site. However, there may be situations (such as when it takes more than one day to adequately survey a site or when it may lead to duplication or confusion later) when it makes sense to enter more than one day's information on the same data sheet/map. It may also be beneficial to have all the breeding data on one map which keeps the picture in front of the observer at all times. This allows the observer to see gaps for certain species and explore areas not previously covered. The most important objective is to make sure the record is clear as to the date of each observation/set of observations and the name of the investigator so that clarification can be sought, if necessary.

Raptor, and other, nests are often less visible later in the breeding season, when deciduous trees have regained their foliage. However, note any stick nests in the area as "SN" followed by the appropriate observation number. Indicate on the data sheet if you know or suspect what species it belongs to and why. When summarizing yearly data, it will be important to determine which nests are alternate nests of the same pair and which represent additional pairs/territories. Do not get close enough to potentially disturb any nests, without approval from the Project Manager (PM) and Management Unit administrator.

Keep careful track of miles driven and times spent during vehicle transects and point location observations. Deduct any miles/time not spent on monitoring. These details are very important in order to allow data to be normalized over both time and distance to properly analyze for trends. There may be situations when you will not be able to track mileage or the miles you track are complicated by circling back through a study area to recheck a nest to confirm nesting, etc. Just keep good records that can be interpreted by someone else.

ENFORCEMENT/MANAGEMENT ISSUES

Note any enforcement or management problems or opportunities. Suggest corrective action or adaptive management, as appropriate, to the PM. Report any significant enforcement problems to the PM as soon as possible, but no later than within 24 hours of the observation.

RECORDS MANAGEMENT

Management of records is extremely important. Two-hole punched field forms and computer-generated project topo maps must be kept in Study Site folders (in a hard plastic or other secure file box provided) unless being copied. Field forms and topo maps must be attached to the inside of the Study Site folders using the two-hole clips at the end of each field day. Unless other provisions are made, field record copying should be done no less frequently than once a week, during the active field season, with copies placed in the appropriate administration project file for security.

THE SURVEYS

Breeding Season

In some management units, where a fulltime knowledgeable biologist is on staff, daily observations may be made, thereby providing greater potential for trend detection. However, the objective of these guidelines is to conduct up to 6 surveys at each of 12 RMAs (Figure C-1) for the breeding season raptor monitoring, where the assemblage of species dictates the actual number of replicates. Many stick nests will be located during the winter when the deciduous trees have lost their leaves. The next best opportunity to survey will often be early in the breeding season (December through April) when the adult raptors are establishing their territories and courting. Note that each species has a chronology for these behaviors. Some (like the GE, RT, and RS) will start breeding-related behaviors in December or January, while others (like the CH) may not display until April. At this time, they are obvious and concentrating their activities around the likely, and alternative, nest sites. In order to adequately characterize the raptor species present throughout the breeding season, the initial surveys at each site should be separated by 10-14 days, if possible. Subsequent surveys should be scheduled based on the raptor species present and where they are in their reproductive cycle. There will be a period, during which one of the adults will be incubating eggs or sheltering young, while the other adult is off hunting. During this time, it will be difficult to document many raptors and fieldwork may not be the best use of your time for that RMA. The next logical time to concentrate on conducting breeding season surveys will be when the young have fledged but are still dependent on the adults for food. At this time, there is a lot of activity and an increased chance of spotting a family unit because of the increased number of individuals per territory and, in some cases, the young will call attention to themselves by begging and/or calling to the parents.

The following times are recommended for the (breeding season) Raptor Monitoring Program:

- Late-December
- Mid-January
- Mid-February
- March
- Mid-April
- Mid-May

There are 12 RMAs that will be surveyed (Table C-1).

TABLE C-1. MSCP Raptor Monitoring Areas (Breeding Season)

Area	Name	Study Sites* (original number(s)
A	San Pasqual	San Pasqual (36), Lk. Hodges (7), Boden Cyn. (2), Rockwood (32)
B	Ramona Grasslands	Ramona Grasslands (30)
C	Penasquitos Canyon	Penasquitos Canyon (33)
D	Iron Mountain Complex	Iron Mountain** (11), San Vicente ((16), Route 67 (27)
E	San Diego River	San Diego River (26)
F	Sloan Canyon	Sloan Canyon (31), McGinty Mtn. North (5), Sycuan Mtn. North (17)
G	Sweetwater River	Sweetwater Reservoir (45), Rcho. S.D. East (42), Rcho. S.D. West (43), San Miguel Mtn. North (23)
H	Proctor Valley	Proctor Valley (25), San Miguel Mtn. South (23), Upper Otay Lk.(14)
I	Rancho Jamul	Jamul Ranch (3), Hollenbeck Canyon (34)
J	Border Fields	Border Fields (44), Tijuana River (part)
K	Brown Field Complex	Brown Field (22), Otay River, Spring Cyn. (part), Dennery Cyn. (part)
L	Otay Mountain	Otay Mountain (12), Marron Valley (13), Lower Otay Lake (14)

* In some cases, only a portion of a study site is included because of access, visibility, or some other reason (see detailed maps, Appendix C-1, for details).
** Including Monte Vista Ranch.

Each study site is followed by a number, which corresponds to the original study site number that was assigned to it (WRI 2002, 2004).

Winter Surveys

In keeping with the timing of many "winter" surveys (e.g., County Bird Atlas), the MSCP winter raptor surveys will occur primarily from *mid-December through February*, with possible changes in response to changes in weather conditions (i.e., global warming, cycles, etc.). This "winter" time period is somewhat arbitrary and we are not suggesting that raptors observed during this period are, necessarily, only birds that have migrated in and are wintering within the MSCP and environs. Similarly, the winter visit by some species may extend before and/or after this timeframe. The FH, for instance, can arrive on its MSCP wintering grounds by mid-September and not leave until mid-March. Many of the birds that you observe will be the same ones that you document during the "breeding season" surveys. The objective is to conduct three (3) vehicle-based surveys, along the coastal route depicted by Figure C-2. In order to adequately characterize the raptor species present throughout the winter season, the three surveys should be conducted according to the following schedule:

- Late December
- Mid-to-late January
- Mid-to-late February

Raptor, and other, nests are often more visible in the winter, when deciduous trees have lost their foliage. Knowledge about nest and breeding pair locations will help the monitor separate wintering birds from resident pairs. When summarizing yearly data, it will also be important to determine which nests are alternate nests of the same pair and which represent additional pairs/territories. Note any raptor nests in the area and/or if any nesting behavior is observed. Do not approach any nests, without approval from the PM and Management Unit administrator.

LITERATURE CITED

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County of San Diego. 1997. "Multiple Species Conservation Program", County of San Diego; Subarea Plan. Adopted by the Board of Supervisors October 22, 1997.

Ogden. 1996. "Biological Monitoring for the Multiple Species Conservation Program." Prepared for the City of San Diego, California Department of Fish and Game, and U.S. Fish and Wildlife Service. Revised April 25.

Wheeler, B.K and W.S. Clark 1999. A Photographic Guide to North American Raptors. Academic Press. San Diego.

APPENDIX C-2
ACRONYMS AND DEFINITIONS

Raptor and Corvid Species

AC	American crow
AK	American kestrel
BE*	**BALD EAGLE**
BH	Black hawk
BR	Barn owl
BO*	**BURROWING OWL**
CH*	**COOPER'S HAWK**
CR	Common raven
FH*	**FERRUGINOUS HAWK**
GE*	**GOLDEN EAGLE**
GO	Great-horned owl
HH	Harris' hawk
LO	Long-eared owl
MR	Merlin
NH*	**NORTHERN HARRIER**
OS	Osprey
PF*	**PEREGRINE FALCON**
PR	Prairie falcon
RS	Red-shouldered hawk
RT	Red-tailed hawk
SE	Short-eared owl
SO	Screech owl
SS	Sharp-shinned hawk
SH*	**SWAINSON'S HAWK**
TV	Turkey vulture
UA	Unidentifiable accipiter
UB	Unidentifiable buteo
UF	Unidentifiable falcon
UR	Unidentifiable raptor
WK	White-tailed kite
WH	White-tailed hawk
ZH	Zone-tailed hawk

* MSCP target species.

Other Abbreviations

AB	Active burrow
Ad	Adult
CDFG	California Department of Fish and Game
CN	Cavity nest
F	Female
HY	Hatching year (when a bird is in its first year; i.e., the same calendar year as hatched).
Imm	Immature (a non-specific term that means "not adult").
M	Male
Mel	Melanistic (black/dark)
Ruf	Rufous/reddish
Sa	Sub adult (plumage that precedes adult plumage and appears much like it but with some characters that are not in adult plumage; used only for species, like the Golden Eagle, that can be distinguished at this age).
SN	Stick nest.
U	Unknown (e.g., unknown species, age, or sex).
USFWS	U.S. Fish and Wildlife Service

APPENDIX C-3

TRANSECT DATA SHEET

Wildlife Research Institute, Inc.

BIOLOGIST(S):

			Start	Finish	
		TIME (24hr)			(minus time out) = TOTAL TIME:
		TEMP (F):			OTHER WEATHER INFO.:
DATE:	PAGE __OF ___	CLOUD CVR (%):			TRANSECT MILEAGE BEGIN:
TRANSECT NAME & NUMBER:		WIND (mph):			TRANSECT MILEAGE END:
		VISIBILITY (mi):			SUBTRACT MILEAGE:
	#	PRECIP:			TRANSECT TOTAL MILEAGE:

	WAYPOINTS (Start/End Points of Transects, Road Names.etc.)	SPECIES	TIME DURATION	SEX	AGE	PAIR	PERCHING	HUNTING	FEEDING	COURTSHIP	SOARING	NESTING	COMMENTS, MILEAGE, TIME, ETC.
1													
2													
3													
4													
5													
6													
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25													

COMMENTS: (USE REVERSE FOR DRAWINGS OR ADDITIONAL NOTES)

Exhibit F-3

LEAST BELL'S VIREO
Vireo bellii pusillus

Author: Michael A. Patten, Department of Biology, University of California, Riverside, California 92521

Management Status: Federal: Endangered
California: Endangered (CDFG, 1998)

General Distribution:

The Least Bell's Vireo is a subspecies of the Bell's Vireo. The Bell's Vireo breeds in the southwestern United States and northwestern Mexico, northward through the Great Plains of the central United States to the southwestern fringe of the Great Lakes (Brown, 1993). This species winters in southern Baja California, on the Pacific slope of mainland Mexico from Sonora south through northern Nicaragua (Brown, 1993), and on the Atlantic slope from Veracruz south to Honduras (AOU, 1998).

Distribution in the West Mojave Planning Area:

The Least Bell's Vireo breeds in southwestern California and adjacent northwestern Baja California (Wilbur, 1980, Garrett and Dunn, 1981); it largely occurs in cismontane southern California, but it does extend into transmontane areas along the western flank of the Anza-Borrego Desert (San Diego County; Unitt, 1984), in the vicinity of Palm Springs (Riverside County; C. McGaugh pers. comm.), at Leona Valley (Los Angeles County; summering, breeding not proven; K.L. Garrett in litt.), and in San Bernardino County at Morongo Valley and along the Mojave River (Patten, 1995; S. J. Myers in litt.). There are breeding records for this subspecies just north of the WMPA in the southern Owens Valley of Inyo County and it regularly breeds just northwest of the WMPA at the South Fork of the Kern River Preserve (Kern County; M.T. Heindel pers. comm.). Elsewhere within the WMPA, the Bell's Vireo is an occasional migrant.

The eastern limit of the range of the Least Bell's Vireo in California is contentious, in that the ranges of the Least Bell's Vireo and the Arizona Bell's Vireo (*V. b. arizonae*) in California are based more on supposition than on direct evidence. It is generally believed that the Arizona Bell's Vireo is confined to the Lower Colorado River Valley, whereas the Least Bell's Vireo occurs in cismontane southern California and on the western edge of the deserts, extending north up the Mojave River into the Owens Valley, and eastward into Death Valley National Park, along the Amargosa River (Inyo County) and at Fort Piute in the East Mojave Desert (Goldwasser, 1978; Goldwasser et al., 1980; Garrett and Dunn, 1981; Regional Environmental Consultants, 1986; Franzreb, 1987a, 1987b, 1989; Brown, 1993; Small, 1994). Considering the biogeography of similarly-distributed cismontane and transmontane species pairs (Grinnell and Miller, 1944; Garrett and Dunn, 1981), such as California (*Callipepla californica*) and Gambel's quail (*C. gambelii*), Nuttall's (*Picoides nuttallii*) and Ladder-backed woodpeckers (*P. scalaris*), and California (*Toxostoma redivivum*) and Crissal thrashers (*T. crissale*), it is probable that Arizona Bell's Vireo is in fact the subspecies occurring in the East Mojave Desert (including Fort Piute and the Amargosa River) northward through Death Valley, and this subspecies may occasionally occur in the extreme eastern portion of the WMPA. Data to support this contention is provided

by the observations that spring birds in Death Valley and at Fort Piute are more brightly-colored (i.e., they have a greener back and yellower flanks), and thus more like *V. b. arizonae*, than are birds along the Mojave River or at Morongo Valley, which are grayer and thus more like *V. b. pusillus* (M.A. Patten pers. obs.). Also, there is a late February specimen of the Arizona Bell's Vireo taken in the Anza-Borrego Desert (Unitt, 1985; Phillips, 1991), showing that this subspecies can occur well west of its described range.

Natural History:

The Bell's Vireo is a conspicuous member of riparian habitats where it occurs because of its lively, complex song. However, given its penchant for dense vegetation, it is far more often heard than seen. Its song belies its rather subtle, drab plumage: this small passerine is basically olive-gray (with emphasis on the latter in *V. b. pusillus*) above with a single faint wingbar, a thick bill, thin but distinct "spectacles," and a long tail that is flipped expressively from side-to-side. In overall plumage and behavior, this species most closely resembles a Gray Vireo (*V. vicinor*), a species with a very different song that occurs in pinyon-juniper and redshank-chaparral associations.

The Least Bell's Vireo and the Arizona Bell's Vireo differ slightly in size and subtlety of color, with the latter being slightly smaller and more brightly colored (Ridgway, 1904; Phillips, 1991). Specimens of Bell's Vireo from eastern California (e.g., Death Valley) were identified as Least Bell's Vireo (Ridgway, 1904; Grinnell, 1923). However, these specimens were taken in spring (Fisher, 1893; Grinnell, 1923), when the plumage of a Bell's Vireo can be quite worn (Unitt, 1985), thus confounding subspecific identification. An examination of specimens at the Natural History Museum of Los Angeles County, the Museum of Vertebrate Zoology, University of California, Berkeley, and elsewhere indicates that evidence for defining the eastern extent of the range of Least Bell's Vireo is weak (M.A. Patten unpubl. data; A.R. Phillips in litt.; N.K. Johnson in litt.). Seven external characters have proven useful in distinguishing these subspecies (Ridgway, 1904; Phillips, 1991): exposed culmen length, wing chord, tail length, rump color, flank color, mantle color, and undertail covert color. These subspecies may also have slight differences in song (L.R. Hays pers. comm.), and they apparently differ in habitat choice (see below).

The Least Bell's Vireo arrives on its breeding grounds in mid-March (Brown, 1993), with males arriving slightly before females (Nolan, 1960; Barlow, 1962). This vireo shows a high degree of nest site tenacity (Greaves, 1987). Most individuals depart by September (Brown, 1993), although some individuals remain on their breeding grounds into late November (Rosenberg et al., 1991). This subspecies winters primarily in Baja California, with occasional individuals remaining through the winter in cismontane southern California (there is also a record for the Sonoran Desert at this season, although the subspecies in not known). Nesting takes place from early April through the end of July, with two broods usually being attempted. Nests are suspended from forks in dense bushes or small trees; over 60 species of plants have been used by Bell's Vireos for nest sites (Brown, 1993), but the Least Bell's Vireo predominantly uses willows (*Salix* spp.). The Bell's Vireo feeds almost exclusively on arthropods, with insects and spiders comprising over 99% of their diet (Brown, 1993).

Habitat Requirements:

The Bell's Vireo occurs in riparian habitats. The Least Bell's Vireo typically breeds in willow riparian forest supporting a dense, shrubby understory of mulefat (*Baccharis salicifolius*) and other mesic species (Goldwasser, 1981; Gray and Greaves, 1984; Franzreb, 1989). Oak woodland with a willow riparian understory is also used in some areas (Gray and Greaves, 1984), and individuals sometimes enter adjacent chaparral, coastal sage scrub, or desert scrub habitats to forage (Brown 1993; L.R. Hays pers. comm.). The Least Bell's Vireo and the Arizona Bell's Vireo probably have different habitat requirements. Least Bell's Vireos in cismontane California occur in riparian forest dominated by willows (Goldwasser, 1981; Gray and Greaves, 1984), whereas Arizona Bell's Vireos tend to occur in riparian woodland dominated by mesquite (*Prosopis* sp.; Rosenberg et al., 1991; Brown, 1993; L.R. Hays pers. comm.; M.A. Patten pers. obs.). Similar habitats are used during the winter months. Although the Arizona Bell's Vireo will use non-native salt cedar (*Tamarix* spp.) in parts of its range (Brown, 1993), the Least Bell's Vireo avoids riparian areas dominated by these plants.

Population Status:

The most recent published population censuses for the Least Bell's Vireo indicated that this subspecies was critically endangered, with a total population estimated to be only a few hundred pairs (Goldwasser, 1978; Goldwasser et al., 1980; Wilbur 1980). Primarily as a result of extensive efforts to restore riparian habitat and to remove Brown-headed Cowbirds (*Molothrus ater*) from breeding areas, populations of the Least Bell's Vireo have increased dramatically at several locations in cismontane southern California (L.R. Hays pers. comm.; Brown, 1993), particularly at the two core population sites of the Santa Margarita River, San Diego County (±400 pairs) and the Prado Basin, Riverside County (±150 pairs). The total population breeding within the WMPA is much smaller, with only a 1-3 pairs at Morongo Valley and 1-2 pairs along the Mojave River (M.A. Patten pers. obs.; S.J. Myers in litt.).

Threats Analysis:

Loss of habitat, combined with increased brood parasite pressure from Brown-headed Cowbirds (Goldwasser, 1978; Beezley and Rieger, 1987), has led to the two breeding subspecies in California, Least Bell's Vireo and Arizona Bell's Vireo, being listed as Endangered by the State of California and, for *V. b. pusillus*, by the federal government (Franzreb, 1989; Franzreb et al., 1992; Salata, 1992; U.S. Fish and Wildlife Service, 1992). Losses of habitat similarly have affected the Bell's Vireo throughout its range (Brown, 1993). Habitat loss within the WMPA probably most often results from flood control efforts (e.g., stream channelization or vegetation clearing along the Mojave River). Conversion of occupied habitat to parks or golf courses is generally less of a problem, if only because it occurs more rarely.

Although Brown-headed Cowbirds are perhaps less prevalent in transmontane sites occupied by this vireo, cowbirds nevertheless can have a huge negative impact on the breeding success of the Least Bell's Vireo (Goldwasser, 1978; Beezley and Rieger, 1987; Clark, 1988), and they have increased dramatically in California in the past century (Laymon, 1987; Rothstein, 1994). Populations of the Least Bell's Vireo have responded dramatically to efforts to remove cowbirds from breeding areas (see above), underscoring the severe impact of brood parasitism. The recent, albeit slow, northwesterly range expansion of the Bronzed Cowbird (*M. aeneus*), could present this vireo with yet another brood parasite (M.A. Patten unpubl. data).

Biological Standards:

Much effort has been expended to maintain minimum viable populations of the Least Bell's Vireo at certain core population sites in cismontane southern California (e.g., the Santa Margarita River, the Prado Basin, and the Santa Ynez drainage in Santa Barbara County). Recovery efforts have generally been extremely successful; prospects for the long-term survival of the Least Bell's Vireo are much better now than they were 15-20 years ago when recovery was initiated (L.R. Hays pers. comm.). However, even historically this vireo has occurred only in low numbers within the WMPA, and in few locations, so management of vireo habitat within its boundary likely will not have a substantial effect on the subspecies as a whole. Nevertheless, conservation and sustainable management of the small breeding populations at Morongo Valley and along the Mojave River could be accomplished through (1) limiting the destruction of riparian habitat in these areas, including less invasive flood control management activities, (2) eradication of non-native salt cedar, giant reed (*Arundo donax*), and Russian olive (*Elaeagnus angustifolius*) from sites occupied by the vireo, with willows and mulefat planted in their place, (3) extensive trapping and removal of Brown-headed Cowbirds from breeding areas, and (4) restoration of riparian habitats, because cowbird parasitism is reduced woodland habitats with lower edge to area ratios (Laymon 1987). An additional measures could be the limiting access of both cattle and humans (hikers and off-highway vehicle users) to prime nesting areas.

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expected that compliance with receiving water limitations will be achieved through an iterative process and the application of increasingly more effective BMPs.

C. The Permittees shall comply with Section VI.A of this Order through timely implementation of control measures and other actions to reduce pollutants in urban and storm water runoff in accordance with the MSWMP and its components and other requirements of this Order, including any modifications thereto

D. Upon a determination by either the Permittees or the Executive Officer that the discharges from the MS4 systems are causing or contributing to an exceedance of an applicable water quality standard, the Permittees shall promptly notify either by phone or by e-mail and, thereafter submit a report within 30 days (or if approved by the Executive Officer, this report may be incorporated into the annual report) to the Executive Officer for review and approval. At a minimum, the report shall:

   a. Describe BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce those pollutants that are causing or contributing to the exceedance of water quality standards.

   b. Address the cause of the impairment or exceedance, and the technical and economic feasibility of control actions available to the Permittees to reduce or eliminate the impairment or exceedance consistent with the MEP standard.

   c. Include an implementation schedule.

   d. Contain a comparative analysis of monitoring data to the USEPA Multi-Sector Permit Parameter Benchmark Values and applicable water quality objectives for inland surface streams as specified in Chapter 4 of the Basin Plan.

   e. A status report on the effectiveness of the pollution source investigation and control plan implementation to address exceedance of water quality objectives or elevated pollutant levels above benchmark values may be incorporated in the annual report unless the Executive Officer directs a different submittal date. The transmittal letter shall indicate that the annual report contains a description of additional BMPs proposed, pollution investigation report, and/or pollution source investigation and control plan.

E. The Executive Officer may require modifications to the plan and/or report. The Permittees shall submit any modifications required by the Executive Officer within 30 calendar days of notification. The plan and/or report shall be deemed acceptable if the Executive Officer does not respond with requested modifications within 30 days of the submittal date.

F. Within 60 calendar days following the Executive Officer's approval of the plan and/or report described above (or within 60 days following the date the plan and/or report were deemed acceptable due to lack of response from the Executive Officer), the Permittees shall revise the storm water management programs (MSWMP and LIP) and monitoring program to incorporate the additional BMPs that will be implemented, the implementation schedule, and any additional monitoring required.

G. Permittees must implement the revised the MSWMP, the LIP and the monitoring and reporting programs in accordance with the schedule approved by the Executive Officer.

H. So long as the Permittees have complied with the procedures set forth above and are implementing the revised LIP, MSWMP, and monitoring program, the Permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless the Executive Officer determines it is necessary to develop additional BMPs.

I. Nothing in Section VI.D must prevent the Regional Board from enforcing any provision of this Order while the Permittee prepares and implements the above programs.

VII. LEGAL AUTHORITY/ENFORCEMENT

A. The Permittees shall maintain adequate legal authority to control the discharge of pollutants to their MS4s through ordinance, statute, permit, contract or similar means and enforce these authorities. This legal authority must, at a minimum, include and authorize the Permittees to:

1. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits. The Permittee must have authority to enter, sample, monitor, inspect, take measurements, photographs, videos, review and copy records, and require reports from industrial, commercial, and construction sites discharging into their MS4s;

2. Recover its cost to correct a discharger's significant non-compliance or to respond to immediate and serious threat to water quality violations through various mechanisms, such as forfeiture of permit deposits, trust funds/bonds or other short-term funding sources to allow Permittees to immediately address and remedy serious water quality violations at construction, industrial, or commercial sites;

3. Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s;

4. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of pollutants to the MS4s;

5. Prohibit the disposal of wastes onto public or private land that may cause water quality concerns, unless permitted by Waste Discharge Requirements (WDR) or waiver by the Regional Board;

6. The Permittees' storm water ordinances or other local regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include but are not limited to: verbal and/or written warnings, notice of violation or non-compliance, monetary penalties, non-monetary penalties, bonding requirements, stop work or cease and desist Orders and/or permit denials/revocations/stays for non-compliance, civil or criminal prosecution. These sanctions shall be issued in a decisive manner within a predetermined timeframe, from the time of the violation's occurrence and/or follow-up inspection.

B. The Permittees shall document progressive and decisive enforcement actions against violators of their storm water codes and ordinances in accordance with the formalized enforcement procedures developed by the Management Committee.

C. The Permittees shall use the most effective tool(s) at their disposal (such as Stop Work Orders and suspended inspections) to achieve immediate compliance. Permittees must have the ability to enforce any violations of the Stop Work Order through either an automatic fine or other effective means.

D. Within three (3) years of adoption of this Order, the Permittees shall implement fully adopted ordinances that would specify control measures for known pathogen or bacterial sources such as animal wastes if those types of sources are present within their jurisdiction.

E. The Permittees shall continue to provide notification to Regional Board staff of storm water related information obtained during site inspections of industrial and construction sites regulated by the Statewide General Storm Water Permits or sites which should be regulated under the State's General Permits. The notification should include any observed violations of the General Permits or local requirements, prior history of violations, any enforcement actions taken and will be taken by the Permittees, and any other relevant information.

F. The Permittees shall annually notify owners of other MS4 systems outside the Permittees' jurisdiction, regarding the regulatory requirements for control of pollutants in MS4 discharges (including relevant requirements from the MSWMP and WQMP), where feasible, and consistent with the MEP standard. The Permittees will also send these notifications to the Regional Board. The Permittees shall specify, in the LIP, the mechanisms or procedures to control the contribution of pollutants into their MS4s prior to accepting connections from owners of other MS4 systems outside the Permittees' jurisdiction. At a minimum, the Permittees shall notify these owners of other MS4 systems outside their jurisdiction of the requirement to comply with the post-construction standard in the State's General Construction Permit (Order No. 2009-0009-DWQ). A copy of the notification shall be provided to the Regional Board.

G. The Permittees shall annually review their water quality ordinances and evaluate their effectiveness in prohibiting the following types of discharges to the MS4s (the Permittees may propose appropriate control measures in lieu of prohibiting these discharges, where the Permittees are responsible for ensuring that dischargers adequately maintain those control measures):

1. Sewage (also prohibited under the Statewide SSO Order[54]);
2. Wash water resulting from the hosing or cleaning of gas stations, auto repair garages, and other types of automobile service stations;
3. Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility, including motor vehicles, concrete mixing equipment, portable toilet servicing, etc.;
4. Wash water from mobile auto detailing and washing, steam and pressure cleaning, carpet/upholstery cleaning, pool cleaning and other such mobile commercial and industrial activities;

[54]State Board WQO No. 2006-0003.

5. Water from cleaning of municipal, industrial, and commercial sites, including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
6. Runoff from material storage areas or uncovered receptacles that contain chemicals, fuels, grease, oil, or other hazardous materials[55];
7. Discharges of runoff from the washing of toxic materials[56] from paved or unpaved areas;
8. Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; pool filter backwash containing debris and chlorine;
9. Pet waste, yard waste, litter, debris, sediment, etc.; and,
10. Restaurant or food processing facility wastes such as grease, floor mat and trash bin wash water, food waste, etc.

H. Each Permittee shall include in its LIP the legal authorities and mechanisms used to implement the various program elements required by this Order to properly manage, reduce and mitigate potential pollutant sources within its jurisdiction. The LIP shall include citations of appropriate local ordinances, identification of departmental jurisdictions and key personnel in the implementation and enforcement of these ordinances. The LIP shall include procedures, tools and timeframes for progressive enforcement actions and procedures for tracking compliance.

I. The Permittees shall enforce their ordinances and permits at all construction sites, industrial facilities and commercial facilities as necessary to maintain compliance with this Order. Sanctions for non-compliance shall include: monetary penalties, bonding requirements and/or permit denial or revocation.

J. Within 12 months of adoption of this Order, each Permittee shall submit a certification statement, signed by legal counsel, that the Permittee has obtained all necessary legal authority in accordance with 40 CFR 122.26(d)(2)(i)(A-F) and to comply with this Order through adoption of ordinances and/or municipal code modifications. A copy of the certification shall also be placed in the LIP. Those Permittees who have already complied with this requirement during the third-term permit need not submit additional certification statements.

K. Annually thereafter, Permittees shall review adequacy of their ordinances, implementation and enforcement response procedures with respect to the above items. The findings of the reviews, along with supporting details and recommended corrective actions and schedules shall be submitted as part of the annual report for the corresponding reporting period. The Permittees' LIPs shall be updated accordingly.

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[55]Hazardous material is defined as any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by EPA to be reported if a designed quantity of the material is spilled into the waters of the United States or emitted into the environment.

[56]Toxic material is a chemical or a mixture that may present an unreasonable risk of injury to health or the environment.

VIII. ILLICIT DISCHARGES (ID)/ILLEGAL CONNECTIONS (IC); LITTER, DEBRIS AND TRASH CONTROL

A. The Permittees shall continue to prohibit all illegal connections to the MS4s through their ordinances, inspections, monitoring programs, and enforcement actions. The Permittees shall develop a pro-active IC/ID or illicit discharge detection and elimination program (IDDE) using the Guidance Manual for Illicit Discharge, Detection, and Elimination by the Center for Watershed Protection[57] or any other equivalent program. Any illegal connections identified by routine inspections, the IDDE program, or dry weather screening and/or monitoring shall be investigated and eliminated or permitted within 120 days of discovery.

B. The Permittees' IDDE program shall specify a procedure to conduct focused, systematic field investigations, outfall reconnaissance survey, indicator monitoring, and tracking of discharges to their sources[58]. The IDDE program(s) shall be linked to urban watershed protection efforts including: a) the use of GIS maps of the Permittees' conveyance systems to track sources ; b) aerial photography to detect IC/IDs; b) municipal inspection programs of construction, industrial, commercial, storm drain systems, municipal facilities, etc.; c) analysis of watershed monitoring and other indicator data; d) watershed education to educate the public about illegal discharges; e) pollution prevention for generating sites; f) stream restoration efforts/opportunities; and g) rapid assessment of stream corridors to identify dry weather flows and illegal dumping.

C. The LIP shall identify the staff positions responsible for different components of the IDDE program.

D. The Permittees shall maintain a database of permitted and unpermitted connections, routine inspections and dry weather monitoring. This information shall be updated on an ongoing basis and submitted with the annual report.

E. The Permittees shall control, consistent with the MEP standard, the discharge of spills, leaks, or dumping of any materials other than storm water and authorized non-storm water per Section V, above, into the MS4s. All reports of spills, leaks, and/or illegal dumping shall be promptly investigated and reported as specified under Section XVII (Notification Requirements).

F. The Permittees shall continue to characterize trash, determine its main source(s) and develop and implement appropriate BMPs and control measures to reduce and/or to eliminate the discharge of trash and debris to Waters of the U.S. to the MEP. These control measures and their effectiveness in reducing trash shall be reported in the annual report.

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[57] USEPA (Illicit Discharge Detection and Elimination - A Guidance Manual for Program Development and Technical Assessments) by the Center for Watershed Protection and Robert Pitt, University of Alabama, October 2004, updated 2005).

[58] Table 2: Land uses, Generating Sites and Activities that Produce Indirect Discharges from IDDE, A Guidance Manual for Program Development and Technical Assessments, October 2004 CWP.

IX. SEWAGE SPILLS, INFILTRATION INTO MS4 SYSTEMS FROM LEAKING SANITARY SEWER LINES, SEPTIC SYSTEM FAILURES, AND PORTABLE TOILET DISCHARGES

A. The Permittees shall provide local sanitation districts 24-hour access to the MS4s to address sewage spills and shall provide updated contact information to enable such access. The Permittees shall work cooperatively with the local sewering agencies to determine and control the impact of infiltration from leaking sanitary sewer systems on storm water quality. Each Permittee shall implement control measures necessary to minimize infiltration of seepage from sanitary sewers to the storm drain systems through routine preventive maintenance of the storm drain system.

B. Permittees who are regulated under the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ, (SSO Order), shall continue to comply with that Order to control sanitary system overflows.

C. The Principal Permittee shall collaborate with the local sewering agencies to review and revise, as needed, the Sanitary Sewer Overflow Unified Response Plan to ensure its consistency with the SSO Order.

D. The interagency or interdepartmental sewer spill response coordination and responsibility within each Permittee's jurisdiction shall be described in the LIP.

E. The Permittees shall implement management measures and procedures to prevent, respond to, contain and clean up all sewage and other spills that may be discharged into their MS4s. Management and/or preventative measures shall also be implemented for sources including portable toilets and failing septic systems that are causing or contributing to urban and storm water runoff pollution problems in their jurisdictions.

F. Within 2 years of adoption of this Order, Permittees with septic systems in their jurisdiction shall develop an inventory of septic systems within its jurisdiction and establish a program to ensure that failure rates are minimized pending adoption of regulations as per Assembly Bill 885[59] regarding onsite waste water treatment systems.

X. MUNICIPAL INSPECTION PROGRAMS

A. General Requirements

1. The Permittees shall continue to maintain and update the inventory of all construction, industrial and commercial facilities within their jurisdiction that have a reasonable potential to discharge pollutants to the MS4 regardless of whether the sites are subject to the California Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities or the California Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities or other individual NPDES permit or Waste Discharge Requirements. The Permittees may use the MS4 Solutions or equivalent database for this purpose (see X.A.2., below).

[59] http://www.waterboards.ca.gov/water_issues/programs/septic_tanks/

2. The Permittees shall conduct regular inspections of construction sites, industrial and commercial facilities to evaluate compliance with applicable municipal ordinances, local permits, Storm Water Management Plans, and Water Quality Management Plans (see Sections B, C, and D, below for frequency of inspections). Inspections shall review pollution control practices, implementation and maintenance of pollution control measures, material handling and waste disposal practices, spill prevention and response programs and owner/operator knowledge of environmental laws and regulations, including local ordinances. The Permittees shall enforce their ordinances and permits at all construction, industrial, and commercial facilities in a fair, firm and consistent manner.

3. The municipal inspection program activities shall be documented in an electronic database. The database system must include relevant information on ownership, Standard Industrial Classification (SIC) codes, General Permit Waste Discharge Identification (WDID) number (if any), size, Geographic Information System (GIS) data in NAD83/WGS84[60] compatible formatting with latitude/longitude in decimal degrees, and other pertinent details describing the nature of activities at the site. The information shall be maintained in the MS4 Solution Database or equivalent internet accessible database. In addition to the facility information, the inspection information shall include: date of inspection; inspectors and facility personnel present; site conditions, any observed non-compliance; enforcement actions and/or corrective actions required and schedules for corrective actions; and date of full compliance. The database shall be updated at least once each year and an electronic copy provided to the Regional Board with each annual report.

4. Within 18 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees shall develop a risk-based scoring system to prioritize construction, industrial and commercial facilities and to determine the frequency of inspections. The scoring system shall consider factors including, but not limited to: the hazardous nature of materials used on site; potential for erosion and pollutant discharges, particularly such materials as pre-production plastic (nurdles) or pollutants for which the receiving water is impaired; site size and location including proximity to receiving water, history of spills and leaks; use of pollution control and prevention measures; and compliance history. The risk-based scoring system shall include criteria to identify the facilities as high, medium or low risk and shall be submitted to the Executive Officer for approval. The electronic database submitted with the annual report (see X.A.3, above) shall include the risk-based scores for each facility. The facility scores must be reviewed and updated annually, if necessary.

5. Prior to development and implementation of the risk-based scoring system, construction, industrial and commercial sites shall be inspected in accordance with the prioritization scheme set forth in the third term permit.

6. Any site found in significant non-compliance with the Statewide General Permits or the MS4 Permit is deemed a high priority site and must be contacted or inspected at

[60] NAD83/WGS84=North American Datum of 1983 and World Geodetic System of 1984 are systems to define three dimensional coordinates of a single physical point.

least once per month until full compliance is achieved.

7. The Permittees shall verify during inspections and/or prior to local permit issuance whether a site has obtained necessary permit coverage under one or more of the Statewide General Permits, an individual NPDES permit, Waste Discharge Requirements, and/or 401 Certification. Local permits, certificates of occupancy, or other approvals shall not be granted until proof of coverage under the applicable statewide permit is verified.

8. The Permittees shall deem facilities operating without a proper permit to be in significant non-compliance. Appropriate enforcement measures shall be implemented including a time schedule to obtain coverage, or suspension of business license until evidence of permit coverage is provided. Non-filers shall be reported within 14 calendar days to the Regional Board by electronic mail or other written means. The Permittees shall include in their LIP the method for verification of permit coverage and for notification of non-filers to the Regional Board.

9. Permittees shall maintain hard or electronic copies and make available upon request all information related to their inspections, including inspection reports, photographs, videotapes, enforcement actions, notices of correction issued to dischargers and other relevant information. This information shall be linked to the electronic database identified in Section X.A.3 above.

10. The Permittees need not inspect facilities already inspected by Regional Board staff if the inspection was conducted within the specified time period. Regional Board staff inspection information is available at www.ciwqs.ca.gov[61].

11. Each Permittee shall respond to complaints received from third parties in a timely manner to ensure that the construction, industrial and commercial sites are not a source of pollutants in the MS4s and the receiving waters. Each Permittee shall implement a system of prioritizing the complaints based on threat to the environment (water quality/public health) and an appropriate response time based on this prioritization.

12. Each Permittee shall document, evaluate, and annually report the effectiveness of its enforcement procedures in achieving prompt and timely compliance. When timely compliance is not achieved, the Permittee shall take appropriate corrective measures to immediately prevent or abate the discharge of pollutants into its MS4 system.

13. Where storm water related inspections and/or enforcement required by this Order are carried out on behalf of the Permittee by other agencies or departments such as: the County Public Health, county and/or local fire departments, code enforcement, industrial pretreatment, building and safety, etc., the Permittee shall monitor and annually evaluate and report adequacy of such programs in complying with this Order.

[61] To obtain access to the State database, registration at the following link is necessary: http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml. Contact information is available at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/contactus.shtml.

14. All inspectors conducting storm water inspection as required in this Order shall be trained in accordance with the training requirements specified in Section XVI.

B. Construction Sites

1. Each Permittee shall include in the electronic database identified in Section X.A.3 an inventory of all construction sites within its jurisdiction for which building or grading permits are issued and activities at the site include: soil movement; uncovered storage of materials or wastes, such as dirt, sand or fertilizer; or exterior mixing of cementaceous products, such as concrete, mortar or stucco.
2. Prior to approval of the risk-based scoring and prioritization system, the Permittees shall continue to prioritize construction sites within its jurisdiction as a high, medium or low threat to water quality. This prioritization of construction sites shall be based on factors, which shall include but not be limited to: soil erosion potential, project size, proximity and sensitivity of receiving waters and any other relevant factors. At a minimum, high priority construction sites shall include: sites 50 acres and greater; sites over 1 acre that are tributary to Clean Water Act section 303(d) waters listed for sediment or turbidity impairments; site specific characteristics[62], and any other relevant factor. At a minimum, medium priority construction sites shall include: sites between 10 to less than 50 acres of disturbed soil. Upon approval of the risk-based scoring system, the sites shall be categorized as high, medium, or low risk based on the risk-based scores.
3. Each Permittee shall conduct construction site inspections for compliance with its ordinances (grading, Water Quality Management Plans, etc.) and local permits (construction, grading, etc.). The Permittees shall develop a checklist for conducting site inspections. Inspections of construction sites shall include, but not be limited to:
   a. Verification of coverage under the General Construction Permit (Notice of Intent (NOI) or Waste Discharge Identification No.) during the initial inspection. Permit coverage shall also be confirmed in the event of a change in ownership.
   b. A review of the Erosion and Sediment Control Plans (ESCP) to ensure that the BMPs implemented on-site are consistent with the appropriate phase of construction (Preliminary Stage, Mass Grading Stage, Streets and Utilities Stage, Vertical Construction Stage, and Post-Construction Stage).
   c. Visual observations for non-storm water discharges, potential illicit connections, and potential pollutant sources.
   d. Determination of compliance with local ordinances, permits, Water Quality Management Plans and other requirements, including the implementation and maintenance of BMPs required under local requirements.
   e. An assessment of the effectiveness of BMPs implemented at the site and the need for any additional BMPs. In evaluating BMP effectiveness, the Permittees may consider applicable action levels (AL) and/or numeric effluent limits (NEL)

[62] The approved General Construction Permit Order No. 2009-0009-DWQ includes risk-based characterization of construction sites based on site-specific conditions.

promulgated by the State or USEPA.

4. At a minimum, the inspection frequency shall include the following:
   a. During the wet season[63] (i.e., Oct 1 through May 31 of each year), all high priority (or high risk) sites are to be inspected, in their entirety, once a month. All medium priority (or medium risk) sites are to be inspected at least twice during the wet season. All low priority (or low risk) sites are to be inspected at least once during the wet season. When BMPs or BMP maintenance is deemed inadequate or out of compliance, an inspection frequency of once every week shall be maintained until BMPs and BMP maintenance are brought into compliance.
   b. During the dry season (i.e., June 1 through September 30 of each year), all construction sites shall be inspected at a frequency sufficient to ensure that sediment and other pollutants are properly controlled and that unauthorized, non-storm water discharges are prevented.
5. The Permittees' implementation of their construction storm water program shall be consistent with the latest version of the statewide General Construction Permit and all applicable provisions of the federal effluent limitations guidelines.

C. Industrial Facilities

1. Prior to approval of the risk-based scoring and prioritization system, the Permittees shall continue to prioritize industrial facilities within its jurisdiction as high, medium, or low threat to water quality. The prioritization of these facilities should be based on such factors as type of industrial activities (SIC codes)[64], materials or wastes used or stored outside, pollutant discharge potential, compliance history, facility size, proximity and sensitivity of receiving waters, and any other relevant factors. At a minimum, a high priority shall be assigned to: facilities subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); facilities that handle or generate pollutants for which the receiving water is impaired, facilities that have a demonstrated or significant potential to release pre-production plastic or nurdles into the environment, and facilities with a high potential for or history of unauthorized, non-storm water discharges. Upon approval of the risk-based scoring system, the facilities shall be categorized as high, medium or low risk.
2. Each Permittee shall conduct industrial facility inspections for compliance with its ordinances, permits and this Order. Industrial inspections shall include: a review of the site's material and waste handling and storage practices; a review of written documentation of pollutant control BMP implementation and maintenance procedures; digital photographic documentation of water quality violations, and/or evidence of past or present unauthorized-, non-storm water discharges; and enforcement actions issued at the time of inspection if necessary. A summary of

[63] Wet and dry season for TMDL compliance evaluation will be the months as defined in the TMDL development documents and implementation plans. See Glossary, Attachment 4.

[64] Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the General Industrial Permit or other individual NPDES permit;

inspections shall be included in the annual report and shall document the rational for downgrading or upgrading the priority ranking of industrial facilities.

3. All high priority (or high risk) industrial facilities are to be inspected at least once a year; all medium priority (or medium risk) sites are to be inspected at least once every two years; and all low priority (or low risk) sites are to be inspected at least once per permit cycle. In the event that inappropriate material or waste handling or storage practices are observed, or there is evidence of past or present unauthorized, non-storm water discharges, appropriate enforcement actions shall be taken and a re-inspection frequency adequate to bring the site into full compliance must be maintained.
4. Each Permittee shall require industrial facilities to implement source control and pollution prevention measures consistent with the BMP Fact Sheets developed by the Permittees.

D. Commercial Facilities

1. All of the following types of commercial facilities are deemed to have a reasonable potential to discharge pollutants to the MS4s. These types of facilities shall be included in the database identified in Section X.A.3. Commercial facilities may include, but may not be limited to[65]:

   a. Transport, storage or transfer of pre-production plastic pellets;
   b. Automobile mechanical repair, maintenance, fueling or cleaning;
   c. Automobile and other vehicle body repair or painting;
   d. Automobile impound and storage services;
   e. Airplane repair, maintenance, fueling or cleaning;
   f. Marinas and boat repair, maintenance, fueling or cleaning;
   g. Equipment repair, maintenance, fueling or cleaning;
   h. Pest control service facilities;
   i. Eating or drinking establishments, including food markets and restaurants;
   j. Cement mixing, concrete cutting, masonry facilities;
   k. Building materials retailers and storage facilities;
   l. Portable sanitary service facilities;
   m. Painting and coating;
   n. Animal facilities such as petting zoos and boarding and training facilities;
   o. Nurseries, greenhouses, botanical or zoological gardens;
   p. Landscape and hardscape installation;
   q. Pool, lake and fountain cleaning; and
   r. Golf courses, parks and other recreational areas/facilities;

2. The Permittees shall continue to develop BMPs applicable for each of the commercial operations described above.

[65]Mobile cleaning services are addressed in X.D.6 and 7, below.

3. Prior to approval of the risk-based scoring system, each Permittee shall conduct inspections of commercial facilities within its jurisdiction in accordance with the prioritization scheme set forth in the third-term permit.
4. All high priority (or high risk) facilities shall be inspected at least once per year; all medium priority (or medium risk) facilities shall be inspected at least every two years; and all low priority (or low risk) facilities shall be inspected at least once per permit cycle. At a minimum, each facility shall be required to implement source control and pollution prevention measures consistent with the BMP Fact Sheets developed by the Permittees.
5. In the event that inappropriate material or waste handling or storage practices are observed, or there is evidence of past or present unauthorized, non-storm water discharges, appropriate enforcement action shall be taken and documented to bring the site into compliance.
6. Within 36 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees, shall notify all mobile businesses operating within the Permit area regarding the minimum source control and pollution prevention measures that they must develop and implement. For purposes of this Order, mobile businesses include: mobile auto washing/detailing; equipment washing/cleaning; carpet, drape, and furniture cleaning; and mobile high pressure or steam cleaning. The mobile businesses shall be required to implement appropriate control measures within 3 months of being notified of the requirements.
7. Within 36 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees, shall develop an enforcement strategy to address mobile businesses. Each Permittee shall also distribute the BMP Fact Sheets to the mobile businesses identified for notification as required in Section X.D.6, above. At a minimum, the mobile business Fact Sheets/training program should include: laws and regulations dealing with urban runoff and discharges to storm drains; appropriate BMPs and proper procedure for disposing of wastes generated from each mobile business.
8. The Principal Permittee, in coordination with the Co-Permittees shall continue to maintain a restaurant inspection program, or coordinate and collaborate with the San Bernardino County Public Health Agency's restaurant inspection program. The restaurant inspection program shall, at a minimum, address:
    a. Oil and grease disposal to verify that these wastes are not poured into a trash bin, storm sewers, parking lot, street or adjacent catch basin;
    b. Trash bin areas to verify that these areas are clean, the bin lids are closed, and the bins are not used for disposing of liquid wastes;
    c. Parking lot, alley, sidewalk and street areas to verify that floor mats, filters and garbage containers are not washed in those areas and that no wash water is disposed of into those areas;
    d. Parking lots to verify that they are cleaned by sweeping, not by hosing down, and that the facility operator uses dry methods for spill cleanup; and,

e. Inspection of existing devices designed to separate grease from wastewater (e.g., grease traps or interceptors) to ensure adequate capacity and proper maintenance is currently performed under the Fats, Oils and Grease (FOG) program (the FOG inspections conducted under the Statewide SSO Order [Water Quality Order No. 2006-0003] could be substituted for this inspection).

9. All violations of the Water Quality Ordinance shall be enforced by the Permittees and all violations of the Health and Safety Code should be enforced by the Public Health Agency.

E. Residential Program

1. Within 36 months of adoption of this Order, each Permittee shall, consistent with the MEP standard, develop and implement a residential program designed to reduce the discharge of pollutants from residential facilities to the MS4s and to prevent discharges from the MS4s from causing or contributing to exceedances of water quality standards in the receiving waters.
2. The Permittees shall identify residential areas and activities that are potential sources of pollutants and develop Fact Sheets/BMPs. At a minimum, this should include: residential auto washing and maintenance activities; use and disposal of pesticides, herbicides, fertilizers and household cleaners; and collection and disposal of pet wastes. The Permittees shall encourage residents to implement pollution prevention measures. The Permittees should work with sub-watershed groups to disseminate the latest research information from organizations such as the Inland Empire Resource Conservation District[66], The Land Trust Alliance, The USDA Natural Resources Conservation Service, USDA's Backyard Conservation Program[67], and others.
3. Each Permittee shall document its residential program in its LIP.
4. The Permittees shall continue to, collectively or individually, facilitate the proper collection and management of used oil, toxic and hazardous materials, and other household wastes. Such facilitation shall include educational activities, public information activities, and establishment of curbside or special collection sites managed by the Permittees or private entities, such as solid waste haulers. Each Permittee shall continue these programs and periodically evaluate their effectiveness in reducing discharges of pollutants into the MS4s.
5. The Permittees shall develop and implement control measures for common interest areas and areas managed by homeowner associations or management companies. This may include development and promotion of public education materials identifying BMPs for these common interest areas or HOA areas. The Permittees

[66]The District provides gardening and horticulture information appropriate for the area including native plant selection, backyard management, alternatives to pesticide, irrigation scheduling and composting.

[67]Backyard Conservation, Bringing Conservation from the Countryside to Your Backyard, USDA Natural Resources Conservation Service, National Association of Conservation Districts, Wildlife Habitat Council and National Audubon Society.

should evaluate the applicability of programs such as the Landscape Performance Certification Program[68] to encourage efficient water use and to minimize runoff[69].

6. The Permittees shall enforce their Water Quality Ordinance for all residential areas and activities. The Permittees should encourage new developments to use weather-based evapotranspiration (ET) irrigation controllers[70].
7. Each Permittee shall include an evaluation of its Residential Program in the annual report starting with the first annual report after adoption of this Order.

XI. NEW DEVELOPMENT (INCLUDING SIGNIFICANT RE-DEVELOPMENT)

A. General Requirements:

1. Each Permittee shall continue to ensure (prior to issuance of any local permits or other approvals) that all non-Permittee construction sites that are one acre or greater, and sites less than one acre if part of a common plan of development have filed with the State Board a Notice of Intent for coverage under the State's General Construction Permit and have been issued a valid Waste Discharge Identification (WDID) number. Each Permittee shall describe its General Permit coverage verification procedures in its LIP.
2. Each Permittee shall ensure that the erosion and sediment control plans it approves include appropriate erosion and sediment control BMPs (e.g., erosion control measures for sloped or hill-side developments, ingress/egress controls, perimeter controls, run-on diversion, etc.) such that an effective combination of BMPs consistent with site risk is implemented through all phases of construction.
3. Each Permittee shall utilize the BMP studies conducted during the previous permit terms to determine the most appropriate erosion and sediment control BMPs. The conditions of approval shall require erosion and sediment control plans, SWPPPs, and WQMPs, as applicable. These documents shall specify the appropriate BMPs.
4. Each Permittee shall ensure, consistent with the maximum extent practicable standard, that runoff from development projects it approves, does not cause nuisance to adjoining or downstream properties and stream channels.
5. Each Permittee shall ensure, to the MEP, that urban runoff conveyance systems created resulting from development projects it approves are appropriately maintained consistent with Section XIII of this Order or are adequately maintained by a legally responsible party.

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[68] For example, see the Metropolitan Water District of Orange County's Evaluation of the Landscape Performance Certification Program, January 2004.

[69] The Residential Runoff Reduction Study, Municipal Water District of Orange County, Irvine Ranch Water District and Metropolitan Water District of Southern California, July 2004.

[70] Westpark Study, Municipal Water District of Orange County, Irvine Ranch Water District and Metropolitan Water District of Southern California, 2001.

6. Prior to accepting connections from owners of other MS4 systems outside the Permittees' jurisdiction, the Permittees shall notify these owners of other MS4 systems outside their jurisdiction of the requirement to comply with the post-construction standard in the State's General Construction Permit and the regulatory requirements for control of pollutants in MS4 discharges (including relevant requirements from the MSWMP and WQMP), where feasible, and consistent with the MEP standard. A copy of the notification shall be provided to the Regional Board.
7. Each Permittee shall ensure that appropriate control measures to reduce erosion and maintain stream geomorphology are included in the design for replacement of existing culverts or construction of new culverts and/or bridge crossings.
8. Each Permittee shall minimize the short and long-term adverse impacts on receiving water quality from public and private new development and significant re-development projects, as required in Section XI.D (Water Quality Management Plan), below, by continuing to review, approve, and verify implementation of project-specific WQMPs, emphasizing implementation of LID principles, where feasible, and addressing hydrologic conditions of concern, and long term operation and maintenance mechanisms prior to project closure or issuance of certificates of occupancy.
9. Each Permittee shall participate in the development of the Watershed Action Plan, described in Section B below, to integrate water quality, stream protection and stormwater management and re-use within the permitted area with land use planning policies, ordinances, and plans, as applicable, and consistent with the MEP standard.

B. **Watershed Action Plan**

1. The Permittees shall develop an integrated watershed management approach to improve integration of planning and approval processes with water quality and quantity control measures. Management of the water quality and hydrologic impacts of urbanization will be more effective whether managed on a per site, sub-regional or regional basis, if coordinated within the Watershed Action Plan. Pending completion of a Watershed Action Plan, management of the impacts of urbanization shall be accomplished using existing programs.
2. Within twelve months of adoption of this Order, each Permittee shall review the watershed protection principles and policies, specifically addressing urban and storm water runoff, in its planning procedures, including CEQA preparation, review and approval processes; General Plan and related documents including, but not limited to its Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance; and WQMP development and approval processes.
3. The Principal Permittee, in collaboration with the Co-Permittees, shall develop a Watershed Action Plan (WAP) that describes and implements the Permittees' approach to coordinated watershed management. The WAP shall improve coordination of existing programs and identify new and/or enhanced program elements as applicable. The objective of the WAP is to improve integration of water quality, stream protection, storm water management, water conservation and re-use, and flood protection, with land use planning and development processes. The WAP shall be developed in two phases:

a. Phase 1: within 12 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees shall:

   i. Identify program-specific objectives for the WAP; the objectives will include consideration of:

      1. The watershed protection principles specified in Section XI.C.3.a – g, below;

      2. The Permittee's planning and procedure review required in XI.B.2, above;

      3. Potential impediments to implementing watershed protection principles during the planning and development processes, including but not limited to LID principles and management of the impacts of hydromodification;

      4. Impaired waters [CWA § 303(d) listed] with and without approved TMDLs, pollutants causing impairment, monitoring programs for these pollutants, control measures, including any BMPs that the Permittees are currently implementing, and any BMPs the Permittees are proposing to implement. In addition, if a TMDL has been developed and an implementation plan is yet to be developed, the WAP shall specify that the responsible Permittees should develop constituent-specific source control measures, conduct additional monitoring and/or cooperate with the development of an implementation plan, where feasible, and consistent with the MEP standard.

   ii. Develop a structure for the WAP that emphasizes coordination of watershed priorities with the Permittees' LIPs via the areawide model LIP;

   iii. Identify linkages between the WAP and the SWQSTF, MSWMP, WQMP, the implementation of LID, and the TMDL Implementation Plans;

   iv. Identify other relevant existing watershed efforts (Chino Basin Master Plan, SAWPA's IRWMP, etc., and their role in the WAP;

   v. Ensure that the HCOC Map/Watershed Geodatabase is available to watershed stakeholders via the World Wide Web, and has incorporated the following information:

      1. Delineation of existing unarmored or soft-armored drainages in the permitted area that are vulnerable to geomorphological changes due to hydromodification and those channels and streams that are engineered, hardened, and maintained.

      2. GIS layers for known sensitive species, protected habitat areas, drainage boundaries, and potential storm water recharge areas and/or reservoirs;

      3. 303(d)-listed waterbodies and associated pollutants;

      4. Available and relevant regulatory and technical documents accessible via hyperlinks;

vi. Develop a schedule and procedure for maintaining the Watershed Geodatabase, and develop a draft schedule for expected enhancements to increase functionality;

vii. Review the Watershed Geodatabase with Regional Board staff from the Storm Water, TMDL, and Watershed Planning/ Program Sections, and other resource agencies, to verify attributes of the Geodatabase, including drainage feature stability/susceptibility/risk assessments, and the intended use of the Geodatabase to support regulatory processes such as WQMP approvals, Clean Water Act Section 401 Water Quality Standards Certifications (401 Certifications), and LID BMP feasibility evaluations;

viii. Identify potential causes of identified stream degradation including a consideration of sediment yield and balance on a watershed or subwatershed basis.

ix. Conduct a system-wide evaluation[71] to identify opportunities to retrofit existing storm water conveyance systems, parks, and other recreational areas with water quality protection measures, and develop recommendations for specific retrofit studies that incorporates opportunities for addressing applicable TMDL implementation plans, hydromodification management, and/or LID implementation within the permitted area.

x. Conduct a system wide evaluation to identify opportunities for joint or coordinated development planning to address stream segments vulnerable to hydromodification and coordinated re-development planning to identify restoration opportunities for hardened and engineered streams and channels. The WAP shall identify contributing jurisdictions and the stream segments that will benefit from this coordination.

xi. Invite participation and comments from resource conservation districts, water and utility agencies, state and federal agencies, non-governmental agencies and other interested parties in the development and use of the Watershed Geodatabase;

xii. Submit the Phase 1 components in a report to the Executive Officer for approval. The Report shall be deemed acceptable to the Regional Board if the Executive Officer submitted raises no written objections within 30 days of submittal. .

b. Phase 2: within 12 months of the approval by the Executive Officer of the Report from Phase 1, above, the Principal Permittee, in coordination with the Co-Permittees, shall:

i. Contingent upon consensus with Regional Board staff and other resource agencies as described in XI.B.3.a.vii, above, specify procedures and a schedule to integrate the use of the Watershed Geodatabase into the implementation of the MSWMP, WQMP, and TMDLs;

[71] For example, see the 2005 RBF Retrofit Study conducted for Orange County MS4 permittees.

ii. Develop and implement a Hydromodification Monitoring Plan (HMP) to evaluate hydromodification impacts for the drainage channels deemed most susceptible to degradation. The HMP will identify sites to be monitored, include an assessment methodology, and required follow-up actions based on monitoring results. Where applicable, monitoring sites may be used to evaluate the effectiveness of BMPs in preventing or reducing impacts from hydromodification.

iii. Develop and implement a Hydromodification Management Plan prioritized based on drainage feature/susceptibility/risk assessments and opportunities for restoration.

iv. Conduct training workshops in the use of the Watershed Geodatabase. Each Permittee must ensure that their planning and engineering staff attend a workshop.

v. Conduct demonstration workshops for the Watershed Geodatabase to be attended by appropriate upper-level managers and directors from each Permittee.

vi. Develop recommendations for streamlining regulatory agency approval of regional treatment control BMPs. The recommendations should include information needed to be submitted to the Regional Board for approval of regional treatment control BMPs. At a minimum, this information should include: BMP location; type and effectiveness in removing pollutants of concern; projects tributary to the regional treatment system; engineering design details; funding sources for construction, operation and maintenance; and parties responsible for monitoring effectiveness, operation and maintenance. The Permittees are encouraged to collaborate and work with other counties to facilitate and coordinate these recommendations.

vii. Implement applicable retrofit or regional treatment recommendations from the evaluation conducted in Section B.3.a.ix, above.

viii. Submit the Phase 2 components in a report to the Executive Officer. The submitted report shall be deemed acceptable to the Regional Board if the Executive Officer raises no written objections within 30 days of submittal.

4. Within three years of adoption of this Order, each Permittee shall review the watershed protection principles and policies in its General Plan or related documents (such as Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance) to determine consistency with the Watershed Action Plan. Each Permittee shall report the findings in the annual report along with a schedule for any necessary revision.

C. **Consideration of Watershed Protection Principles in California Environmental Quality Act (CEQA) and Planning Processes:**

1. The Permittees shall ensure that the direct, indirect, and cumulative water quality impacts of storm water and non-storm water runoff are properly considered and addressed in their land-use planning processes. The following potential water quality impacts shall be considered during the preparation and circulation of environmental documents prepared pursuant to CEQA:

   a. Potential impact of project construction on storm water runoff.

   b. Potential impact of project's post-construction activity on storm water runoff.

   c. Potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas.

   d. Potential for discharge of storm water to affect the beneficial uses of the receiving waters.

   e. Potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm.

   f. Potential for significant increases in erosion of the project site or surrounding areas.

2. For any project that may require a 401 Certification from the State, the Permittees shall coordinate project review with Regional Board staff pursuant to the requirements of CEQA. Upon request by Regional Board staff, this coordination shall include the timely provision of the discharger's identity and their contact information and the facilitation of early-consultation meetings

3. The Principal Permittee shall collaborate with the Co-Permittees to develop recommendations to resolve any impediments to implementing watershed protection principles during the planning and development processes, including LID principles and management of hydrologic conditions of concern (See Section E below). The Principal Permittee shall collaborate with the Co-Permittees to develop common principles and policies necessary for water quality protection. The watershed protection principles and policies should include the following:

   a. Avoid disturbance of natural water bodies, drainage systems and flood plains; conserve natural areas; protect slopes and channels; minimize impacts from storm water and urban runoff on the biological integrity of natural drainage systems and water bodies;

   b. Minimize changes in hydrology and pollutant loading; require incorporation of controls including structural and non-structural BMPs to mitigate any projected increases in pollutant loads and flows; ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion, stream habitat; minimize the quantity of storm water directed to impermeable surfaces and the MS4s; maximize the percentage of permeable surfaces to allow more percolation of storm water into the ground;

c. Preserve wetlands, riparian corridors, and buffer zones; establish reasonable limits on the clearing of vegetation from the project site;

d. Use properly designed and well maintained water quality wetlands, biofiltration swales, watershed-scale retrofits, etc., where such measures are likely to be effective and technically and economically feasible;

e. Provide for appropriate permanent measures to reduce storm water pollutant loads in storm water from the development site; and

f. Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

g. Consider pollutants of concern (identified in the risk-based analysis provided in the 2006 ROWD, the annual reports and the list of impaired waterbodies (303(d) list)) and propose appropriate control measures.

4. Within 24 months following the review specified in B.2, above, each Permittee shall incorporate the following information into its LIP and its project approval process:

   a. The Permittees shall identify and map in GIS format the natural channels, wetlands, riparian corridors and buffer zones and identify conservation and maintenance measures for these features. The Watershed Action Plan should include information needed for this effort. This requirement will be most effective if met through development of areawide HCOC maps or other joint efforts.

   b. Each Permittee shall include in the LIP the applicable tools (such as ordinances, design standards, and procedures) used to implement green infrastructure/low impact development principles for public and private development projects.

   c. For hillside development projects, each Permittee shall consider and facilitate application of landform grading techniques[72] and revegetation as an alternative to traditional approaches, particularly in areas susceptible to erosion and sediment loss.

5. Each Permittee shall provide Regional Board staff with the draft amendment or revision when a pertinent General Plan element or the General Plan is noticed for comment in accordance with Govt. Code § 65350 et seq.

D. Water Quality Management Plan (WQMP) Requirements[73]:

1. Each Permittee shall continue to require project-specific Water Quality Management Plans (WQMP) for priority projects listed under Section XI.D.4.a to i.

2. Within 18 months of adoption of this Order, the Principal Permittee shall coordinate the revision of the WQMP Guidance and Template to include new elements required under this Order.

[72] http://www.epa.gov/region3/mtntop/pdf/Appendixes/Appendix%20D%20Aquatic/Aquatic%2OEcosystem%20Enhanc.%20Symp/Proceedings/Support%20Info/Schor/Landform.pdf

[73] Priority projects are those listed under Section XI.D.4.a to i.

3. Each Permittee shall require submittal of a preliminary project-specific WQMP as early as possible during the environmental review or planning phase (land use entitlement). No building or grading permit shall be issued prior to approval of the final project–specific WQMP that is developed based on the preliminary project-specific WQMP and any recommended revisions, as appropriate.
4. The combination of site design/LID BMPs (where feasible), source control, and/or treatment control BMPs, including regional treatment systems, in project-specific WQMPS shall address all identified pollutants and hydrologic conditions of concern from new development and/or significant re-development projects for the categories of projects (priority projects) listed below:
   a. All significant re-development projects. Significant re-development is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site subject to discretionary approval of the Permittee. . Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing developed site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed below applies only to the addition or replacement, and not to the entire developed site. Where redevelopment results in an increase of fifty percent or more of the impervious surfaces of a previously existing developed site, the numeric sizing criteria applies to the entire development.
   b. New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single family home subdivisions, multi-family attached subdivisions or townhomes, condominiums, apartments, etc.), mixed-use, and public projects. This category includes development projects on public and private land, which fall under the planning and building authority of the Permittees.
   c. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532-7534, 7536-7539).
   d. Restaurants (with SIC code 5812) where the land area of development is 5,000 square feet or more.
   e. All hillside developments of 5,000 square feet or more which are located on areas with known erosive[74] soil conditions or where the natural slope is twenty-five percent or more.
   f. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly[75] into environmentally sensitive areas (ESAs) such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of

[74] See General Construction Permit Order No. 2009-0009-DWQ.
[75] Discharging directly means a drainage or conveyance which carries flows entirely from the subject development and not commingled with any other flows.

impaired waters.

g. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary parking or storage of motor vehicles.

h. Retail Gasoline Outlets (RGOs) that are either 5,000 sq feet or more, or have a projected average daily traffic of 100 or more vehicles per day.

i. Emergency public safety projects in any of the above-listed categories shall be excluded if the delay caused due the requirement for a WQMP compromises public safety, public health and/or environmental protection.

5. WQMPs shall include BMPs for source control, pollution prevention, site design, LID implementation, where feasible, (see Section E, below) and structural treatment control BMPs. WQMPs shall include control measures for any listed pollutant[76] to an impaired waterbody on the 303(d) list such that the discharge shall not cause or contribute to an exceedance of receiving water quality objectives. The Permittees shall require the following source control BMPs for each priority development project, unless formally substantiated as unwarranted in a written submittal to the Permittees:

   a. Minimize contaminated runoff, including irrigation runoff, from entering the MS4s;

   b. Provide appropriate secondary containment and/or proper covers or lids for materials storage, trash bins, and outdoor processing and work areas;

   c. Minimize storm water contact with pollutant sources;

   d. Provide community car wash and equipment wash areas that discharge to sanitary sewers;

   e. Minimize trash and debris in storm water runoff through regular street sweeping and through litter control ordinances.

   f. The pollutants in post-development runoff shall be reduced using controls that utilize best management practices, as described in the California Storm Water Quality Handbooks, Caltrans Storm Water Quality Handbook or other reliable sources.

6. Treatment control BMPs shall be in accordance with the approved model WQMP and must be sized to comply with one of the following numeric sizing criteria:

   a. VOLUME

   Volume-based BMP design applies to BMPs where the primary mode of pollutant removal depends upon the volumetric capacity, such as detention, retention, and infiltration basins. These criteria specify the capture and infiltration or treatment of a percentile of the average annual rainfall volume (also referred to as percent capture ratio).

[76]For a waterbody listed under Section 303(d) of the Clean Water Act, the pollutant that is causing the impairment is the "listed pollutant".

Volume–based BMPs shall be designed to infiltrate, harvest and use, filter, or treat either:

i. The volume of runoff produced from a 24-hour, 85th percentile storm event, as determined from the County of San Bernardino's 85th Percentile Precipitation Isopluvial Map; or,

ii. The volume of annual runoff produced by the 85th percentile, 24-hour rainfall event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or,

iii. The volume of annual runoff based on unit basin storage volume, to achieve 80 (or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial (1993); or,

iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event;

OR

b. FLOW

Flow-based BMP design applies to BMPs where the primary mode of pollutant removal depends upon the rate of flow thru the BMP, such as swales, sand filters, screening devices, and proprietary devices such as storm drain inserts.

Flow–based BMPs shall be designed to infiltrate, harvest and use, filter, or treat either:

i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or,

ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or,

iii. The maximum flow rate of runoff, as determined from the local historical rainfall record that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

7. The obligation to install structural BMPs at a new development is met if, for a common plan of development, BMPs are constructed with the requisite capacity to serve the entire common project, even if certain phases of the common project may not have BMP capacity located on that phase in accordance with the requirements specified above. All treatment control BMPs should be located as close as possible to the pollutant sources, should not be located within Waters of the U.S., and pollutant removal should be accomplished prior to discharge to Waters of the U.S. Regional treatment control BMPs shall be completed and operational prior to occupation of any of the priority project sites tributary to the regional treatment BMP.

8. **Groundwater Protection:**

Treatment Control BMPs utilizing infiltration [exclusive of incidental infiltration and BMPs not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.) must comply with the following minimum requirements to protect groundwater:

a. Use of structural infiltration treatment BMPs shall not cause or contribute to an exceedance of groundwater water quality objectives.

b. Source control and pollution prevention control BMPs shall be implemented to protect groundwater quality. The need for pre-treatment BMPs such as sedimentation or filtration should be evaluated prior to infiltration.

c. Adequate pretreatment of runoff prior to infiltration shall be required in gas stations and large commercial parking lots.

d. Unless adequate pre-treatment of runoff is provided prior to infiltration structural infiltration treatment BMPs must not be used for areas of industrial or light industrial activity[77], areas subject to high vehicular traffic (25,000 or more daily traffic); car washes; fleet storage areas; nurseries; or any other high threat to water quality land uses or activities.

e. Class V injection wells or dry wells must not be placed in areas subject to vehicular[78] repair or maintenance activities[79], such as an auto body repair shop, automotive repair shop, new and used car dealership, specialty repair shop (e.g., transmission and muffler repair shop) or any facility that does any vehicular repair work.

f. Structural infiltration BMP treatment shall not be used at sites that are known to have soil and groundwater contamination.

g. Structural infiltration treatment BMPs shall be located at least 100 feet horizontally from any water supply wells.

h. The vertical distance from the bottom of any infiltration structural treatment BMP to the historic high groundwater mark shall be at least 10 feet. Where the groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained.

i. Structural infiltration treatment BMPs shall not cause a nuisance or pollution as defined in Water Code Section 13050.

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[77] Unless a site assessment pursuant to criteria developed in Section XI.E.3 shows that site operations do not pose a threat to ground water.

[78] Vehicles include automobiles; motor vehicles include trucks, trains, boats, motor cycles, farm machineries, airplanes and recreation vehicles such as snow mobiles, all terrain vehicles, and jet skis.

[79] United States Environmental Protection Agency, Office of Water, EPA 816-R-00-008, September 2000 State Implementation Guidance – (Revisions to the UIC Regulations for the Underground Injection Control Regulations for Class V Injection Wells, 64 FR 68546) indicate that these activities are prohibited from Class V Injection wells.

E. Low Impact Development (LID) and Hydromodification Management to Minimize Impacts from New Development / Significant Redevelopment

The objective of LID is to mimic pre-development site hydrology through technically and economically feasible source control and site design techniques. LID combines hydrologically functional site design with pollution prevention methods to compensate for land development impact on hydrology and water quality.

1. Within 18 months of adoption of this Order, each Permittee shall evaluate any potential barriers to implementing LID principles. This shall be done in conjunction with the requirements specified under Sections XI.B.3.a and XI.C.3. To facilitate implementation of LID BMPs, the Permittees should consider revising their ordinances, codes and building and landscape design standards. The Permittees shall promote green infrastructure/LID BMP implementation and identify the applicable LID principles in the project specific WQMP:

   a. Landscape designs that promote water retention and evapotranspiration such as 1 foot depth of compost/top soil in commercial and residential areas on top of 1 foot of decompacted subsoil, concave landscape grading to allow runoff from impervious surfaces, and water conservation by selecting native plants, weather-based irrigation controllers, etc.

   b. Allow permeable surface designs in low traffic roads and parking lots, where feasible. This may require land use/building code amendment.

   c. Allow natural drainage systems for street construction and catchments (with no drainage pipes), and allow grassy swales and ditches where feasible.

   d. Require parking lots to drain to landscaped areas to provide treatment, retention, or infiltration, where feasible.

   e. Reduce curb requirements, where feasible, where adequate drainage, conveyance, treatment and storage are available.

   f. Amend where feasible and practicable, land use/building codes to allow streets with no curbs and parking lots with no stop blocks to allow storm water to drain into landscaped areas.

   g. Require, where feasible, rainwater harvesting and use.

   h. Consider building narrow streets, alternatives to minimum parking requirements, etc.

   i. Consider vegetated landscape as an integral element of streets, parking lots, playground and buildings as a storm water treatment and retention system.

   j. Consider and facilitate application of landform grading techniques[80] and revegetation as an alternative to traditional approaches, particularly in areas susceptible to erosion and sediment loss such as hillside development projects,

[80] http://www.epa.gov/region3/mtntop/pdf/Appendixes/Appendix%20D%20Aquatic/Aquatic%2OEcosystem%20Enhanc.%20Symp/Proceedings/Support%20Info/Schor/Landform.pdf

k. Consider other site design BMPs identified in the WQMP Guidance and Template and not included above.

2. Consistent with the requirements of AB 1881, each Permittee is mandated to update its landscape ordinance. The bill requires the local agencies to adopt the State Model Water Efficient Landscape Ordinance[81] or prepare one that is "at least as effective" as the State Model by January 2010. The proposed state model ordinance applies to landscape requiring a building or landscape permit, plan check or design review. Each Permittee shall provide the Regional Board a copy of its report to Department of Water Resources (DWR).

3. To reduce pollutants in urban runoff, address hydromodification, and manage storm water as a resource to the maximum extent practicable, WQMPs shall specify preferential use of site design BMPs that incorporate LID techniques in the following manner (from highest to the lowest priority): (1) Preventative measures (these are mostly non-structural measures, e.g., preservation of natural features to a level consistent with the maximum extent practicable standard; minimization of runoff through clustering, reducing impervious areas, etc.) and (2) Mitigative measures (these are structural measures, such as, infiltration, harvesting and use, bio-treatment, etc.). The mitigative or structural site design BMPs shall also be prioritized (from highest to lowest priority): (1) Infiltration BMPs (examples include permeable pavement with infiltration beds, dry wells, infiltration trenches, surface and sub-surface infiltration basins. The Permittees should work with local groundwater management agencies to ensure that infiltration Treatment Control BMPs are designed appropriately; (2) BMPs that harvest and use (e.g., cisterns and rain barrels); and (3) Vegetated BMPs that promote evapotranspiration including bioretention, biofiltration and bio-treatment.

4. The Permittees shall reflect in the Water Quality Management Plan Guidance and Template and require each priority development project to infiltrate, harvest and use, evapotranspire, or bio-treat[82] the 85th percentile storm event ("design capture volume"), as specified in Section XI.D. 6 above. Any portion of the design capture volume that is not infiltrated, harvested, used, evapotranspired or bio-treated[83] onsite by LID BMPs shall be treated and discharged in accordance with the requirements set forth in Section XI.E.10 and/or Section XI.G, below.

5. Within 18 months of adoption of this Order, the Permittees shall review and update the Water Quality Management Plan Guidance and Template to incorporate LID principles (where feasible) and to address the impact of urbanization on downstream hydrology. At a minimum, the following elements shall be included during the update:

   a. Site Design BMPs:

[81] http://www.water.ca.gov/wateruseefficiency/landscapeordinance/

[82] A properly engineered and maintained bio-treatment system may be considered only if infiltration, harvesting and use and evapotranspiration cannot be feasibly implemented at a project site (feasibility criteria will be established in the WQMP [Section XI.E.7]. Specific design, operation and maintenance criteria for bio-treatment systems shall be part of the model WQMP that will be produced by the permittees.

[83] For all references to bio-treat/bio-treatment, see footnote 82.

i. Review and update the menu of site design BMPs to include any LID BMP that is currently not listed.

ii. Include as a reference for design and installation of LID BMPs the *LID Guidance Manual for Southern California* developed by the Southern California Coastal Water Research Project upon its completion.

iii. Techniques or specifications to minimize soil compaction in areas designated for site design BMPs, especially infiltration.

iv. Review and update design, installation and test specifications for retention BMPs to prevent unwanted ponding.

v. Evaluate the use of a credit system[84] for using site design BMPs.

vi. Develop in-lieu programs for projects where implementation may not be feasible.

b. Source Control BMPs:

i. Review and update the menu of source control BMPs.

ii. Include design and installation standards for each structural source control BMP.

c. Treatment Control BMPs:

i. Update the list of treatment control BMPs, including an evaluation of their effectiveness based on national, statewide or regional studies.

ii. Prioritize treatment control BMPs based on their effectiveness in pollutant removal and require project proponents to select the most appropriate BMPs.

iii. Include design and installation standards for each treatment control BMP.

d. Hydrologic Conditions of Concern (HCOC):

i. The Permittees shall continue to ensure, consistent with the MEP standard, through their review and approval of project-specific WQMPs that new development and significant re-development projects:

a) do not cause a hydrologic condition of concern (HCOC), or

b) otherwise, demonstrate that the project does not have the potential to cause significant adverse impacts on downstream natural channels and habitat integrity, alone or in conjunction with the impacts of other projects likely to be implemented in the same drainage area.

ii. A development/redevelopment project does not cause a HCOC if it causes no adverse downstream impacts on the physical structure, aquatic, and riparian habitat and any of the following conditions is met: and any of the following conditions is met:

[84]See sample credit calculation spreadsheet in Appendix 2 of the adopted statewide construction permit,. http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

a) The project disturbs less than one acre and is not part of a common plan of development.

b) The post-development site hydrology (including runoff volume, velocity, duration, time of concentration[85],) is not significantly different from pre-development hydrology for a 2- year return frequency storm. A difference of 5% or less is considered insignificant.

c) All downstream conveyance channels that will receive runoff from the project are engineered, hardened and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected. This exemption is only applicable to conveyance channels that have received regulatory approvals prior to June 1, 2004, including CEQA review and approvals by US Army Corps of Engineers, Regional Board, and California Department of Fish and Game.

iii. Where flow reduction strategies are established as part of TMDL compliance plans, decreases in flow loading from pre-development conditions are allowed and encouraged where necessary to protect or restore designated beneficial uses.

iv. If a project causes a HCOC, and a Watershed Action Plan has not been approved, the WQMP shall specify one of the following:

a) Verify the project's potential to cause significant adverse impacts by conducting a further evaluation of the projects impact on stream geomorphology and/or aquatic habitat. This evaluation should include consideration of pre- and post-development hydrograph volumes, time of concentration and peak discharge velocities for a 2 year storm event, consideration of sediment budgets, and a sediment transport analysis. If this evaluation confirms the project's potential to cause significant adverse downstream impacts on downstream natural channels and habitat integrity, alone or in conjunction with impacts of other projects, then the project shall satisfy items b), c), d), e), or f), below. If the evaluation indicates minimal impact on stream channels and habitats, no further action is required.

b) Require additional onsite or offsite mitigation to reduce potential erosion or impacts to aquatic habitats by using LID BMPs, where feasible, or other control measures.

c) Require in-stream controls[86] to mitigate the impacts on downstream natural channels and habitat integrity. The project proponent should first consider site design controls and on-site controls prior to proposing in-stream controls; in-stream controls must not adversely impact beneficial uses or

[85] Time of concentration is defined as the time after the beginning of rainfall when all portions of the drainage basin are contributing simultaneously to flow at the outlet.

[86] In-stream measures involve modifying the receiving stream channel slope and geometry so that the stream can convey the new flow regime without increasing the potential for erosion and aggradation. In-stream measures are intended to improve long-term channel stability and prevent erosion by reducing the erosive forces imposed on the channel boundary.

result in sustained degradation of water quality of the receiving waters and shall require all necessary regulatory approvals[87].

d) Mitigate the HCOC through implementation of the approved Watershed Action Plan.

e) If site conditions do not permit items b), c), or d) above, the alternatives and in-lieu programs discussed in the LIP, may be considered.

6. The WQMP shall specify methods for determining time of concentration.

7. A feasibility analysis that includes technically-based feasibility criteria for project evaluation to determine the feasibility of implementing LID.

   i. The feasibility analysis shall include a groundwater protection assessment to determine if structural infiltration BMPs are appropriate for the site

8. Integrate Watershed Action Plan and TMDL Implementation Plans into project-specific WQMPs in affected watersheds.

9. Within 18 months of adoption of this Oder, a copy of the updated WQMP Guidance and Template shall be submitted for review and approval by the Executive Officer. The Permittees shall implement the updated WQMP Guidance and Template within 90 days of approval. If the Executive Officer has not approved the WQMP Guidance and Template within 18 months of adoption of this Order, either the Permittees shall require implementation of LID BMPs, or determine infeasibility of LID BMPs for each project through a project-specific analysis, each of which shall be submitted to the Executive Officer, at least 30 days prior to Permittee approval. Such feasibility determinations shall be certified by a Professional Civil Engineer registered in the State of California, and will be documented in the project WQMP, which shall be approved by the Permittee prior to submittal to the Executive Officer. Within 30 days of submittal to the Executive Officer, the Permittee will be notified if the Executive Officer intends to take any action. Once the updated WQMP Guidance and Template has been approved by the Executive Officer, the submittal of feasibility determinations to the Executive Officer is no longer required.

10. If site conditions do not permit infiltration, harvesting and use, and/or evapotranspiration, and/or bio-treatment of the design capture volume at the project site as close to the source as possible, the alternatives a), b), and c), below, and the credits and in-lieu programs discussed under Section G, below, may be considered and implemented:

    a. Implement LID principles to the MEP at the project site close to the point of storm water generation and infiltrate and/or harvest and re-use at least the design capture volume through designated infiltration/treatment areas elsewhere within the project site.

[87] In-stream control projects require a Streambed Alteration Agreement from the California Department of Fish & Game, a CWA section 404 permit from the U.S. Army Corps of Engineers, and a section 401 certification from the Water Board. Early discussions with these agencies on the acceptability of an in-stream modification are necessary to avoid project delays or redesign.

b. Implement LID on a sub-regional basis. For example, at a 100 unit high density housing unit with a small strip mall and a school: connect all roof drains to vegetated areas (if there are any vegetated areas, otherwise storm water storage and use may be considered or else divert to the local storm water conveyance system, to be conveyed to the local treatment system), construct a storm water infiltration gallery below the school playground to infiltrate and/or harvest and re-use the design capture volume.

c. Implement LID on a regional basis. For example, several developments could propose a regional system to address storm water runoff from all the participating developments.

d. For alternatives a), b), and c) above, the pervious areas to which the runoff from the impervious areas are connected should have the capacity to infiltrate, harvest and use, evapotranspire and/or bio-treat at least the design capture volume from the entire tributary area.

F. Road Projects

1. Within 24 months of adoption of this Order, the Principal Permittee, in cooperation with the Co-Permittees, shall develop standard design and post-development BMP guidance to be incorporated into projects for public streets, roads, highways, and freeway improvements to reduce the discharge of pollutants from the projects to the MEP. The draft guidance shall be submitted to the Executive Officer for review and approval and shall meet the performance standards for site design/LID BMPs, source control and treatment control BMPs as well as the HCOC criteria. The guidance and BMPs shall address any paved surface used for transportation of automobiles, trucks, motorcycles, and other vehicles, and excludes routine road maintenance activities where the surface footprint is not increased. The guidance shall incorporate principles contained in the USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" to the maximum extent practicable and at a minimum shall include the following:

   a. Guidance specific to new road projects;
   b. Guidance specific to projects for existing roads;
   c. Size or impervious area criteria that trigger project coverage;
   d. Preference for green infrastructure approaches wherever feasible;
   e. Criteria for design and BMP feasibility analyses on a project –specific basis.

2. Within six months of approval by the Executive Officer, the Permittees shall implement the standard design and post-development plan for all municipal road projects.

3. Pending approval of the standard design and post-development BMP Guidance, Permittees shall require site-specific WQMPs for streets, roads and highway projects consistent with Section XI.D.4 of this Order.

G. Alternatives and In-Lieu Programs

1. If a preferred BMP is not technically feasible, other BMPs should be implemented to mitigate the project impacts, or if the cost of BMP implementation greatly outweighs the pollution control benefits, the Permittees may grant a waiver of the BMPs. All waivers, along with waiver justification documentation, must be submitted to the Executive Officer at least 30 days prior to Permittee approval of the WQMP. Only those projects that have completed a feasibility analysis as specified in the WQMP Guidance and Template (see Section XI.E.7) and approved by the Executive Officer shall be considered for alternatives and in-lieu programs. If a waiver is granted, the Permittees shall ensure that project proponents participate in one of the in-lieu programs discussed in this section.
2. The Permittees may collectively or individually propose to establish an urban runoff fund to be used for urban water quality improvement projects within the same watershed that is funded by contributions from developers granted waivers. The contributions should be at least equivalent to the cost savings for waived projects and and the urban runoff fund shall be expended for projects that provide at least an equivalent amount of water quality improvement (there shall be no net impact on water quality due to a waived project) . If a waiver is granted and an urban runoff fund is established, the annual report for the year should include the following information with respect to the urban runoff fund:
   a. Total amount deposited into the fund and the party responsible for managing the urban runoff fund;
   b. Projects funded or proposed to be funded with monies from the urban runoff fund;
   c. Party or parties responsible for design, construction, operation and maintenance of urban runoff funded projects; and
   d. Current status and a schedule for project completion.
3. The obligation to install structural site design and/or treatment control BMPs at a new development is met if, for a common plan of development, BMPs are constructed with the requisite capacity to serve the entire common project, even if certain phases of the common project may not have BMP capacity located on that phase in accordance with the requirements specified above. The goal of the WQMP is to develop and implement practicable programs and policies to minimize the effects of urbanization on site hydrology, urban runoff flow rates, velocities, duration and time of concentration and pollutant loads. This goal may be achieved through watershed-based structural treatment controls, in combination with site-specific BMPs. All treatment control BMPs should be located as close as possible to the pollutant sources, should not be located within Waters of the U.S., and pollutant removal should be accomplished prior to discharge to waters of the US. Regional treatment control BMPs shall be operational prior to occupation of any of the priority project sites tributary to the regional treatment BMP.
4. The Permittees may establish a water quality credit system for alternatives to LID and hydromodification requirements specified above. The following types of projects may be considered for the credit system:

a. Redevelopment projects that reduce the overall impervious area
b. Brownfield redevelopment
c. High density developments (>7 units per acre)
d. Mixed use and transit-oriented development (within ½ mile of transit)
e. Dedication of undeveloped portions of the project site to parks, preservation areas and other pervious uses
f. Regional treatment systems with a capacity to treat flows from all upstream developments
g. Offsite mitigation within the same watershed (see E.5.d.iv above)
h. City Center area
i. Historic Districts and Historic Preservation areas
j. Live-work developments
k. In-fill projects

5. The water quality credit system should not result in a net impact on water quality.
6. A summary of waivers of LID, Hydromodification and Treatment Control BMPs, along with any water quality credit granted, in-lieu projects or urban runoff fund contribution required by each Permittee shall be included in the annual report.

H. Approval of WQMP

Within 18 months of adoption of this Order, each Permittee shall develop and implement standard procedures and tools, and include in its LIP the following:

1. A WQMP review checklist that incorporates the required elements of the WQMP and a clear process for consultation early in the planning process with the Permittee's appropriate departments and sections. This review process shall involve the Permittee's Planning and Engineering Departments during the preliminary and final WQMP review to adequately incorporate project-specific water quality measures and watershed protection principles in their CEQA analysis.
2. Tools or procedures to incorporate project conditions of approval, including proper funding and maintenance and operation of all structural BMPs. The parties responsible for the long-term maintenance and operation of the BMPs upon project close-out and a funding mechanism for operation and maintenance shall be identified prior to approval of the WQMP.
3. A procedure to ensure that appropriate easements and ownerships are recorded/included in appropriate documents that provides the Permittee the authority for post-construction BMP operation and maintenance (also see J.1, below).
4. A final project close-out procedure and checklist to ensure that post-construction BMPs (site design, structural source control and treatment control BMPs) have been

built as per the approved WQMPs or other conditions of approval and are fully functional prior to issuance of certificates of occupancy (also see I.1 and I.2, below).

5. A procedure to work cooperatively with the local vector control district to address any vector problems associated with the water quality control systems. If not properly designed and maintained, some of the BMPs implemented to treat urban runoff could create a habitat for vectors (e.g., mosquitoes and rodents) and become a nuisance. The WQMP review, approval, and closure processes shall include consultation and collaboration with the local vector control districts on BMP design, installation, and operation and maintenance to prevent or minimize vector issues. If vector or nuisance problems are identified during inspections, the local vector control district should be notified.
6. Staff involved with WQMP review and approval shall be trained in accordance with Section XVI, Training Requirements.

I. Field Verification of BMPs

1. The Permittees' project close-out procedures shall include field verification that site design, source control and treatment control BMPs are designed, constructed and functional in accordance with the approved WQMP. Documentation of the field verification, including the WDID number, if applicable, information on the type, location and maintenance responsibility of the BMPs shall be sent to the Regional Board office by regular mail or electronic mail.
2. In addition, post-construction BMPs shall be inspected, prior to the rainy season, within three years after project completion and every three years thereafter. The Permittees shall verify, through visual observation, that the BMPs are properly maintained, operating, and are functional. Results of the inspections shall be reported in the Annual Report.

J. Change of Ownership and Recordation

1. The Permittees shall establish a mechanism to track changes in ownership and responsibility for the operation and maintenance of post-construction BMPs to ensure that they are properly recorded in public records at the County and/or City and the information is conveyed to all appropriate parties when there is a change in project or site ownership.
2. The Permittees shall maintain a database to track all structural treatment control BMPs, including the location of BMPs, parties responsible for construction, operation and maintenance.

K. Operation and Maintenance of Post-Construction BMPs

1. The Permittees shall ensure, to the MEP, that all post-construction BMPs continue to operate as designed and implemented with control measures necessary to effectively minimize the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, flies, etc. WQMPs shall identify the responsible party for maintenance, including vector minimization and control measures, and funding

source(s) for operation and maintenance of all site design and structural treatment control systems. Permittees shall, through conditions of approval and during inspections, ensure proper maintenance and operation of all permanent structural post-construction BMPs installed in new developments. Design of these structures shall allow adequate access for maintenance.

2. Within twelve months of adoption of this Order, the Permittees shall develop a database to track operation and maintenance of post-construction BMPs. The database should include available BMP information such as the type of BMP design, location of BMPs (latitude and longitude), date of construction, party responsible for maintenance, maintenance frequency, source of funding for operation and maintenance, maintenance verification, and any problems identified during inspection including any vector or nuisance problems. A copy of this database shall be submitted with the annual report.

L. Pre-Approved Projects

1. The above provisions shall be implemented in a manner consistent with the maximum extent practicable standard for all priority projects 90 days from the date of approval of the updated Water Quality Management Plan Guidance and Template as per Section XI.E.5.
2. The above provisions for LID and hydrologic conditions of concern are not applicable to projects that have an approved WQMP prior to the date of adoption of the revised WQMP Guideline and Template (Section XI.D.2). The Regional Board recognizes that full implementation may not be feasible for certain projects which have received tentative tract or parcel map or other approvals prior to the approval of the updated WQMP.

XII. PUBLIC EDUCATION AND OUTREACH

A. The Permittees shall continue to implement the public education efforts already underway as described in the 2006 ROWD/MSWMP and shall implement the most effective elements of the comprehensive public and business education strategy upon completion of the risk-prioritization strategy to this program element. Each year the Permittees shall review their public education and outreach efforts and revise their activities to adapt to the needs identified in the annual reassessment of program priorities with particular emphasis on addressing the most critical behaviors that cause storm water pollution problems. Any changes to the on-going public education program must be described in the annual report.

B. Consistent with the MEP standard, each Permittee shall implement applicable elements of the public education and outreach program measurably increase public knowledge regarding the storm drain system and the impacts of urban runoff on receiving water quality.

C. When feasible and effective, the Permittees shall participate in joint outreach programs with other agencies including, but not limited to the Santa Ana Watershed Project

Authority, Caltrans, and other county and municipal storm water programs to ensure that a consistent message on storm water pollution prevention is disseminated to the public.

D. The Permittees shall facilitate implementation of BMPs listed in the Storm Water Management Plan and/or the Water Quality Management Plan for restaurants, automotive service centers, gasoline stations and other similar facilities by distributing BMP brochures or other fact sheets to these facilities during inspections and/or through other means.

E. Within 12 months from the date of adoption of this Order, the Permittees shall develop and maintain BMP guidance for the control of those potentially polluting activities identified during the previous permit cycle, which are not otherwise regulated by any agency, including guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, and guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting. These guidance documents shall be distributed to the public, trade associations, etc., through participation in community events, trade association meetings and/or by mail.

F. The Permittees shall ensure that appropriate educational materials, including the BMP brochures, are provided to all new industrial and commercial enterprises in their jurisdiction at the time building and construction permits (or occupancy permits) are issued and/or at the time business licenses are issued.

G. The Permittees shall continue to maintain a hotline telephone number and website to allow the public to report illegal dumping from residential, industrial, construction or commercial sites into public streets, storm drains and other waterbodies. The hotline number and website address for reporting storm water pollution problems shall be promoted in an appropriate outreach effort. The Permittees shall further develop and maintain public education materials to encourage the public to report illegal dumping and unauthorized, non-storm water discharges from residential, industrial, construction and commercial sites into public streets, storm drains and to surface waterbodies and their tributaries; clogged storm drains; faded or missing catch basin stencils and general storm water and BMP information. Hotline and web site information shall be included in the public and business education program and shall be listed in the governmental pages of all regional phone books and on the Permittees' website.

XIII. PERMITTEE FACILITIES AND ACTIVITIES

A. Each Permittee shall inventory its fixed facilities, field operations, and drainage facilities, and shall conduct inspections of these facilities on an annual basis to ensure that these facilities and activities do not contribute pollutants to receiving waters, consistent with the MEP standard. At a minimum, the following municipal facilities, that are owned and/or operated by the Permittees, shall be inspected. Records of these facilities and inspection findings shall be maintained in a database:

1. Public streets, roads (including rural roads) and highways within its jurisdiction;

2. Parking facilities;
3. Fire fighting training facilities;
4. Flood management projects and flood control structures;
5. Areas or facilities and activities discharging directly to environmentally sensitive areas such as 303(d) listed waterbodies or those with a RARE beneficial use designation;
6. Publicly owned treatment works (including water and wastewater treatment plants)
   a. Sanitary sewage collection systems shall be adequately maintained to minimize overflows, leaks, or other failures (also see requirements in Section IX, above), but need not be inspected annually unless deemed to be necessary;
7. Solid waste transfer facilities;
8. Land application[88] sites;
9. Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles; and
10. Household hazardous waste collection facilities.
11. Municipal airfields.
12. Parks and recreation facilities.
13. Special event venues following special events (festivals, sporting events).
14. Power washing.
15. Other municipal areas and activities that the Permittee determines to be a potential source of pollutants.

B. The Permittees may develop a risk-based scoring system to prioritize Permittee facilities and activities to determine the frequency and scope of inspections, as an alternative to XIII.A, above. If proposed, the scoring system shall consider factors including, but not limited to: the hazardous nature of materials used on site; potential for erosion and pollutant discharges, particularly such materials as pre-production plastic (nurdles) or pollutants for which the receiving water is impaired; site size and location including proximity to receiving water, history of spills and leaks; use of pollution control and prevention measures; and compliance history. The risk-based scoring system shall include a criterion to identify the facilities as high, medium or low risk and shall be submitted to the Executive Officer for approval. The electronic database submitted with the annual report (see X.A.2, above) shall include the risk-based scores for each facility. The facility and/or activity scores must be reviewed and updated annually, if necessary.

C. At least 80% of the inlets, open channels, and basins shall be inspected at least once during each reporting year and cleaned, if necessary, with 100% of the facilities inspected in a two-year period, using the BMP fact sheet developed by the Management Committee. This information shall be included in the annual report.

D. Each Permittee shall clean its drainage facilities where the inspection reveals that the sediment/storage volume is 25% full or greater, or where there is evidence of illegal discharge, or if accumulated sediment or debris impairs the hydraulic capacity of the facility.

[88] Examples are compost application, animal/dairy manure application, and biosolids application

E. The Permittees' shall evaluate, annually, the inspection and cleanout frequency of drainage facilities, including catch basins, referred to in Section B and C, above. This evaluation shall consider the data generated by historic and ongoing inspections and cleanout of these facilities, and the IC/ID program (Section VIII). The evaluation shall be based on a prioritized list of drainage facilities considering factors such as: proximity to receiving waters, receiving water beneficial uses and impairments of beneficial uses, historical pollutant types and loads from past inspections/cleanings and the presence of downstream regional facilities that would remove the types of pollutants found in the drainage facility. Using this list, the Permittees shall revise their inspection and clean out schedules and frequency and provide justification for any proposed clean out frequency that is less than once a year. This information shall be included in the annual report.

F. Each Permittee shall implement control measures necessary to minimize infiltration of seepage from sanitary sewers to the storm drain systems through routine preventive maintenance of the storm drain system. The Permittees who are also owners and/or operators of sewage collection systems shall also implement a routine maintenance program for the sewage collection systems in accordance with the SSO Order. Each Permittee shall cooperate and coordinate with the appropriate sewage collection agency to swiftly respond to and contain any sewage spills. This control measure and coordination with the sewering agency shall be documented in the LIP.

G. The Permittees shall continue to train its employees in integrated pest management, and pesticide and fertilizer applications.

H. Successful implementation of the provisions in this Order will require the cooperation of many different departments within each Permittee's jurisdiction (e.g., Fire Department, Department of Environmental Health, Planning Department, Transportation Department, Parks and Recreation, Building and Safety, Code Enforcement, etc.) As such, these Permittee departments, programs, or organizations are expected to actively participate in implementing this Order. Other public agency organizations having programs/activities that have an impact on storm water quality are listed in Attachment 3. The Permittees shall ensure that all necessary Permittee departments within their jurisdiction implement their respective requirements as specified in the LIP.

I. Each Permittee shall annually evaluate the information provided to field staff during their maintenance activities to direct public outreach efforts and determine the need for revision of existing maintenance procedures or schedules. The results of this evaluation shall be provided in the annual report.

J. Each Permittee shall include its procedures, schedules, and tools necessary to implement the requirements of this section in its LIP. The LIP shall state the positions responsible for performing and reporting completion of each task and the training requirements for that position.

XIV. MUNICIPAL CONSTRUCTION PROJECTS

A. This Order authorizes the discharge of storm water runoff from construction projects that may result in land disturbance of one (1) acre or more (or less than one acre, if it is part of a larger common plan of development or sale which is one acre or more) that are

under ownership and/or direct responsibility of any of the Permittees. All Permittee construction activities shall be in accordance with the ROWD and MSWMP.

B. Municipal construction projects shall be in compliance with the latest version of the State's General Permit for Stormwater Discharges Associated with Construction Activities except that an NOI need not be filed with the State Board.

C. Prior to commencement of construction activities, the Permittees shall notify the Executive Officer of the Regional Board of the proposed construction project by submitting a Notice of Intent (NOI), or Permit Registration Documents (PRDs) (web-based) as provided in Attachment 7, and a location map depicting the project location. The filing and annual fees for these NOIs/PRDs are waived for the Permittees.

D. Upon completion of the construction project, the Permittee shall notify the Executive Officer or its designee by submitting: (1) a Notice of Termination (NOT), provided in Attachment 8; (2) photographs of the completed project; (3) a site map depicting the project location and the locations of structural post-construction BMPs, including the latitude and longitude, if appropriate; and (4) copies of the final field verification report. A database of post-construction BMPs for which the Permittees are responsible for shall be developed and referenced in the LIP.

E. The Permittees shall develop and implement a WQMP, if applicable, a storm water pollution prevention plan (SWPPP), a monitoring program that is specific for the construction project prior to the commencement of any of the construction activities, and any other reports or plans required under the General Construction Activity Storm Water Permit. The SWPPP and the WQMP shall be kept at the construction site and released to the public and/or Regional Board staff upon request.

F. The Permittees shall give advance notice to the Executive Officer of the Regional Board of any planned changes in the construction activity, which may result in non-compliance with the latest version of the State's General Construction Activity Storm Water Permit.

G. Emergency Permittee public works projects required to protect public health and safety are exempted from compliance with the requirements of this subsection until the emergency ends, at which time they need to comply with the requirements of this section.

H. All other terms and conditions of the latest version of the State's General Construction Activity Storm Water Permit shall be applicable.

XV. PERMITTEES DE-MINIMUS DISCHARGES

A. The Permittees are authorized to discharge de-minimus types of discharges listed under the latest adopted version of the Regional Board's General De Minimus Discharge Permit, currently Order No. R8-2009-0003. The de-minimus discharges from Permittee owned and/or operated facilities and/or activities shall be in compliance with Order No. R8-2009-0003 except that the Permittees need not pay the filing fee.

B. The Permittees shall notify the Executive Officer of the proposed de-minimus types of discharges at least 15 days prior to start of the discharge, by submitting a NOI and supporting documents, as provided in Attachment 9.

C. For existing de-minimus dischargers (authorized to discharge under Order No. R8-2009-003 prior to the adoption date of this Order), discharges will continue to be regulated under the terms and conditions of Order No. R8-2003-003 until a new discharge authorization is issued, provided that the discharger submits, no later than June 10, 2010, an updated NOI, a copy of the current Monitoring & Reporting Program previously issued to the discharger, and proposed treatment modifications (if any). If no application for continued discharges are submitted by that date, the discharger shall do one of the following:

   i. Cease discharge and submit a letter informing the Regional Board that coverage under Order R8-2009-0003 is no longer needed; or

   ii. Apply for new discharge authorization as a new de-minimus discharger, under this Order.

XVI. TRAINING PROGRAM FOR STORM WATER MANAGERS, PLANNERS, INSPECTORS AND MUNICIPAL CONTRACTORS

A. Within 24 months from the date of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees, will update their existing training program to incorporate new or revised program elements related to the development of the LID program, revised WQMP, and establishment of LIPs for each Permittee. The updated training program includes a training schedule, curriculum content, and defined expertise and competencies for storm water managers, inspectors, maintenance staff, those involved in the review and approval of WQMPs, public works employees, community planners and for those preparing and/or reviewing CEQA documentation and for municipal contractors working on Permittee projects.

   1. Within 36 months, the Permittees will update training program elements to incorporate new or enhanced stormwater program elements due for completion within 36 months of permit adoption.

   2. By 48 months, the Permittees will have a completely revised training program that includes any enhanced or new program elements not previously addressed, including the WAP.

B. The curriculum content should include: federal, state and local water quality laws and regulations as they apply to construction and grading activities, industrial and commercial activities; the potential effects of construction, industrial and commercial activities and urbanization on water quality; implementation and maintenance of erosion and sediment control BMPs and pollution prevention measures; the proper use and maintenance of erosion and sediment controls; the enforcement protocols and methods established in the MSWMP, LIP, WQMP, including LID Principles and Hydrologic Conditions of Concern, the CASQA Construction Stormwater Guidance Manual, Enforcement Response Guide and Illicit Discharge/Illegal Connection Training Program. The training program should address vector control issues related to storm water pollution control BMPs

C. The training modules for each category of trainees (managers, inspectors, planners, engineers, contractors, public works crew, etc.) should define the required competencies,

outline the curriculum, and include a testing procedure at the end of the training program and proof of completion of training (Certificate of Completion).

D. At least on an annual basis, the Principal Permittee shall provide and document training to applicable public agency staff on the updated Municipal Activities and Pollution Prevention Strategy (MAPPS), and any other applicable guidance and procedures developed by the Permittees to address Permittee activities in fixed facilities as well as field operations, including conveyance system maintenance. Each Permittee shall document training for its staff related to jurisdiction-specific responsibility, procedures and implementation protocols established in its LIP. The field program training should include Model Integrated Pest Management, pesticide and fertilizer guidelines. Appropriate staff from each municipality shall attend at least three of these training sessions during the term of this Order. The training sessions may be conducted in classrooms or using videos, DVDs, or other multimedia with appropriate documentation and a final test to verify that the material has been properly reviewed and understood. In instances where applicable municipal operations are performed by contract staff, each Permittee shall require evidence that contract staff have received a level of training equivalent to that listed above.

E. The Principal Permittee shall provide and document training for public employees and interested consultants that incorporates at a minimum, the requirements in this Order related to new development and significant re-development and 401 certifications, and model environmental review (CEQA review) for preparation of environmental documents.

F. The Principal Permittee shall provide training information to municipal contractors to assist the contractors in training their staff. In instances where applicable municipal operations are performed by contract staff, the Permittees shall require evidence that contract staff have received a level of training equivalent to that listed above.

G. The Principal Permittee shall either notify designated Regional Board staff regarding training events via e-mail or submit course content in advance of training sessions.

H. Each Permittee shall adequately train any of its staff involved with storm water related projects and the implementation of this Order within six months from being assigned these duties and on an annual basis thereafter, prior to the rainy season.

I. The LIP shall specify the training requirements for Permittee staff and contractor involved in implementing the requirements of this Order. Each Permittee shall maintain a written record of all training provided to its storm water and related program staff.

XVII. NOTIFICATION REQUIREMENTS

A. Within 24 hours of discovery, the Permittees shall provide oral or email notification to the Executive Officer of noncompliant sites within its jurisdiction that are determined to pose a threat to human health or the environment (e.g., an oil spill that could impact wild life, a hazardous substance spill where residents are evacuated, reportable quantities of hazardous substance spills defined in 40 CFR 117 & 302, etc.). Following oral notification, a written report must be submitted to the Executive Officer within 10 days, detailing the nature of the non-compliance, any corrective action taken by the site/facility owner, other relevant information (e.g., past history of non-compliance, environmental damage resulting from the non-compliance, site/facility owner responsiveness) and the

type of enforcement action that will be carried out by the Permittee. Further, incidences of noncompliance shall be recorded along with the information noted in the written report and the final outcome/enforcement for the incident in the appropriate database.

B. Sewage spill notification shall be consistent with the timelines specified in the SSO Order.

C. All reports submitted by the Permittees as per the requirements in this Order for the approval of the Executive Officer shall be publicly noticed and made available on the Regional Board's website, or through other means, for public review and comments. The Executive Officer shall consider all comments received prior to approval of the reports. Any unresolved issues shall be scheduled for a public hearing at a Regional Board meeting after proper public notice.

D. As specified in Section X.A.7, the Permittees shall deem facilities operating without a proper permit to be in significant non-compliance. These facilities shall be reported within 14 calendar days to the Regional Board by electronic mail or other written means. Permittees' notifications of facilities' failure to obtain required permits under the Construction Activities Storm Water General Permit (Construction Permit), Industrial Activities Storm Water General Permit (Industrial Permit), including Requirements to file a Notice of Intent or No Exposure Certification, Notice of Non-applicability, and/or 401 Certification must include, at a minimum, the following documentation:

1. Name of the facility;
2. Operator of the facility;
3. Owner of the facility;
4. Construction/Commercial/industrial activity being conducted at the facility that is subject to the Construction//Industrial General Permit, or 401 Certification; and
5. Records of communication with the facility operator regarding the violation, including an inspection report.

XVIII. PROGRAM MANAGEMENT ASSESSMENT / MSWMP REVIEW

A. Upon the effective date of this Order, the Permittees shall start implementing the 2007 MSWMP and modify it to be consistent with the requirements of this Order and the schedules contained herein. If major modifications to the 2007 MSWMP not addressed in this Order are determined to be necessary, the Permittees shall prepare and submit MSWMP modifications to the Executive Officer for review and approval. Such modifications may include regional and watershed-specific requirements and/or waste load allocations developed and approved pursuant to the TMDL process.

B. By October 1 of each year, the Permittees shall evaluate the MSWMP to determine the need for any revisions in order to reduce pollutants in MS4 discharges to the maximum extent practicable. In addition, the first annual review after adoption of this Order shall include the following:

1. Review of the formal training needs of municipal employees;
2. Review of coordination meeting/training for the designated NPDES inspectors.; and

3. Propose any changes to assess program effectiveness on an area-wide and jurisdictional basis. Permittees may utilize the CASQA Guidance[89] for developing these assessment measures at the six outcome levels. The assessment measures must target both water quality outcomes and the results of municipal enforcement activities.

C. The annual report shall include the findings of this review and a schedule to address necessary revisions, or a copy of the amended MSWMP with the proposed changes. Replacement pages are acceptable if modifications are not extensive. Annual reports shall also be submitted in electronic format.

D. The Management Committee will continue to meet at least 8 times a year to discuss issues related to permit implementation and regional and statewide issues. Each Permittee's designated representative or a designated alternate should attend not less than 7 of 8 scheduled meetings.

XIX. FISCAL RESOURCES

A. Each Permittee shall exercise its full authority to secure the resources necessary to meet the requirements of this Order. This Order may be revised to adjust time schedules to accommodate prioritization of available resources.

B. The Permittees shall prepare and submit a financial summary to the Executive Officer. The financial summary shall be submitted with the annual report each year and shall, at a minimum, include the following:

1. Each Permittee's expenditures for the previous fiscal year,
2. Each Permittee's budget for the current fiscal year,
3. A description of the source of funds, and
4. Each Permittee's estimated budget for the next fiscal year.

XX. PROVISIONS

A. All reports submitted by the Permittees as per the requirements in this Order for the approval of the Executive Officer shall be publicly noticed and made available on the Regional Board's website, or through other means, for public review and comments. The Executive Officer shall consider all comments received prior to approval of the reports. Any unresolved significant issues shall be scheduled for a public hearing at a Regional Board meeting prior to approval by the Executive Officer.

B. Permittees shall demonstrate compliance with all the requirements in this Order and specifically with Section III. Discharge Limitations, and Section IV. Receiving Water Limitations, through timely implementation of their MSWMP and any modifications, revisions, or amendments developed pursuant to this Order approved by the Executive Officer or determined by the Permittees to be necessary to meet the requirements of this Order. The MSWMP, including any approved amendments thereto is hereby made an enforceable component of this Order.

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[89] CASQA, May 2007. Municipal Stormwater Program Effectiveness Assessment Guidance. January 29, 2010 (Final)

C. The Permittees shall, at a minimum, implement all elements of the MSWMP and its components. Where the dates are different from the corresponding dates in this Order, the dates in this Order shall prevail. Any proposed revisions to the MSWMP shall be submitted with the Annual Report to the Executive Officer of the Regional Board for review and approval. All approved revisions to the MSWMP shall be implemented as per the time schedules approved by the Executive Officer. In addition to those specific controls and actions required by: (1) the terms of this Order and (2) the MSWMP and its components, each Permittee shall implement additional controls, if any are necessary, to reduce the discharge of pollutants in storm water to the maximum extent practicable as required by this Order.

D. Certain BMPs implemented or required by the Permittees for urban runoff management may create habitat for vectors (e.g., mosquitoes and rodents) if not properly designed and maintained. Close collaboration and cooperative effort between the Permittees and local vector control districts and the State Department of Health Services during the development and implementation of urban runoff management programs are necessary to minimize potential vector habitat and public health impacts resulting from vector breeding. Nothing in this permit is intended to prohibit inspection or abatement of vectors by the State or local vector control agencies in accordance with the respective Health and Safety Code.

E. The Permittees shall comply with Monitoring and Reporting Program No. R8-2010-0036 and any revisions thereto, which are hereby made a part of this Order. The Executive Officer is authorized to revise the Monitoring and Reporting Program to allow the Permittees to participate in regional, statewide, national or other monitoring programs in lieu of or in addition to Monitoring and Reporting Program No. R8-2010-0036.

F. Upon approval by the Executive Officer or the Regional Board, all plans, reports and subsequent amendments required by this Order shall be implemented and shall become an enforceable part of this Order. Prior to approval by the Executive Officer, these plans, reports and amendments shall not be considered as an enforceable part of this Order.

G. The Permittees shall report to the Executive Officer of the Regional Board:

1. Any enforcement actions and discharges of storm or non-storm water, known to the Permittees, which may have an impact on human health or the environment, and

2. Any suspected or reported activities on federal, state, or other entity's land or facilities, where the Permittees do not have any jurisdiction, and where the suspected or reported activities may be contributing pollutants to Waters of the U.S.

H. The permit application and special NPDES program requirements are contained in 40 CFR 122.21 (a), (b), (d)(2), (f), (p); 122.41 (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l); and 122.42 (c), and are incorporated into this Order by reference.

XXI. PERMIT MODIFICATION

A. Following appropriate public notice, and in accordance with 40 CFR 122.41(f), this Order may be modified, revoked or reissued prior to its expiration date for the following reasons:

1. To address significant changes in conditions identified in the technical reports required by the Regional Board which were unknown at the time of the issuance of this Order;
2. To incorporate applicable requirements of statewide water quality control plans adopted by the State Water Resources Control Board or any amendments to the Basin Plan approved by the Regional Board, the State Board and, if necessary, by the Office of Administrative Law and the USEPA;
3. To comply with any applicable requirements, guidelines, or regulations issued or approved under the Clean Water Act, if the requirements, guidelines, or regulations contain different conditions or additional requirements than those included in this Order; or,
4. To incorporate any requirements imposed upon the Permittees through the TMDL process.

B. The filing of a request by the Permittees for modification, revocation and re-issuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any conditions of this Order.

XXII. PERMIT EXPIRATION AND RENEWAL

A. This Order expires on January 29, 2015 and the Permittees must file a Report of Waste Discharge (permit renewal application) no later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements. The Report of Waste Discharge shall, at a minimum, include the following:

1. A program effectiveness analysis, including the effectiveness of the overall urban and storm water runoff management program in achieving water quality standards in receiving waters.
2. Any proposed revisions to the urban and storm water runoff management program based on the findings of the program effectiveness analysis (this could be included in a revised MSWMP). Revisions to the program elements should be consistent with the risk-based approach proposed in the 2006 Report of Waste Discharge.
3. Changes in land use and/or population including map updates.
4. Any significant changes to the storm drain systems, outfalls, detention or retention basins or dams, and other controls including map updates of the storm drain systems.
5. Any new or revised program elements and compliance schedule(s) necessary to comply with Section VI of this Order.

B. All permit applications (Report of Waste Discharge), annual reports and other information submitted under this Order shall be signed by either a principal executive officer or a ranking elected official (40 CFR 122.22(a)(3)) or a duly authorized representative as per 40 CFR 122.22(b).

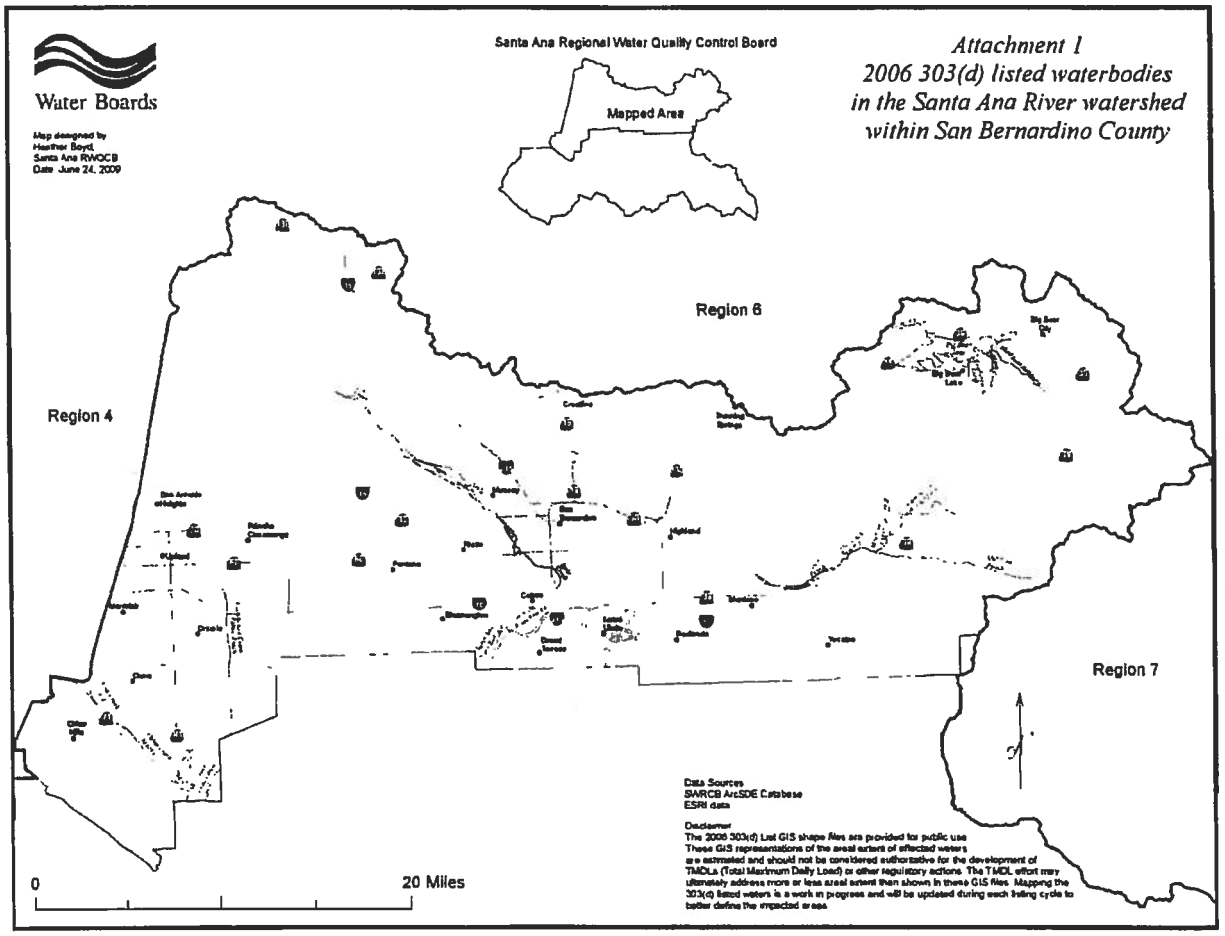
C. This Order shall serve as an NPDES Permit pursuant to Section 402 (p) of the Clean Water Act, or amendments thereto, and shall become effective ten days after the date of its adoption provided the Regional Administrator of the USEPA has no objections. If the

Regional Administrator objects to its issuance, the Permit shall not become effective until such objection is withdrawn.

I, Gerard Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 29, 2010.

Gerard J. Thibeault
Executive Officer

Attachment 1: San Bernardino County Project Area



Attachment 2: Inland Surface Streams

A. Santa Ana River

Santa Ana River, Reaches 4, 5, and 6

B. San Bernardino Mountain Streams

Mill Creek Drainage

- Mill Creek, Reaches 1 and 2
- Mountain Home Creek
- Mountain Home Creek, East Fork
- Monkey Face Creek
- Alger Creek
- Falls Creek
- Vivian Creek
- High Creek
- Other Tributaries: Lost, Oak Cove, Green, Skinner, Momyer and Glen Martin Creeks, and other Tributaries to these Creeks

Bear Creek Drainage

- Bear Creek
- Siberia Creek
- Slide Creek
- All Other Tributaries to these Creeks

Big Bear Lake Tributaries

- North Creek
- Metcalf Creek
- Grout Creek
- Rathbone (Rathbun) Creek
- Summit Creek
- Other Tributaries to Big Bear Lake: Johnson, Minnelusa, Polique, and Red Ant Creeks, and other Tributaries to these Creeks

Baldwin Lake Drainage

- Shay Creek
- Other Tributaries to Baldwin Lake: Sawmill, Green, and Caribou Canyons and other Tributaries to these Creeks.

C. Other Streams Draining to Santa Ana River (Mountain Reaches)

- Cajon Creek
- City Creek
- Devil Canyon Creek
- East Twin and Strawberry Creeks
- Waterman Canyon Creek
- Fish Creek
- Forsee Creek
- Plunge Creek
- Barton Creek

Bailey Canyon Creek
Kimbark Canyon, East Fork Kimbark Canyon, Ames Canyon and West Fork Cable Canyon Creeks
Valley Reaches of Above Streams
Other Tributaries (Mountain Reach): Alder, Badger Canyon, Bledsoe Gulch, Borea Canyon, Breakneck, Cable Canyon, Cienega Seca, Cold, Converse, Coon, Crystal, Deer, Elder, Fredalba, Frog, Government, Hamilton, Heart Bar, Hemlock, Keller, Kilpecker, Little Mill, Little Sand Canyon, Lost, Meyer Canyon, Mile, Monroe Canyon, Oak, Rattlesnake, Round Cienega, Sand, Schneider, Staircase, Warm Springs Canyon and Wild Horse Creeks, and other tributary to these Creeks

D. San Gabriel Mountain Streams (Mountain Reaches)

San Antonio Creek
Lytle Creek (South, Middle, and North Forks) and Coldwater Canyon Creek
Day and East Etiwanda Creeks
Valley Reaches of Above Streams
Cucamonga Creek (Mountain Reach)
Cucamonga Creek (Valley Reach)
Other Tributaries (Mountain Reaches): San Sevaine, Deer, Duncan Canyon, Henderson Canyon, Stoddard Canyon, Icehouse Canyon, Cascade Canyon, Cedar, Falling Rock, Kerkhoff and Cherry Creeks, and other tributaries to these Creeks.

E. San Timoteo Area Streams

San Timoteo Creek, Reaches 1 and 2
Oak Glen, Potato Canyon and Birch Creeks
Yucaipa Creek

F. Prado Area Streams

Chino Creek

G. Lakes and Reservoirs

Baldwin Lake
Big Bear Lake
Jenks Lake
Prado Park Lakes

Attachment 3: List of Other Entities with the Potential to Discharge Pollutants to the San Bernardino County Storm Water Conveyance System

A. Government Agencies

U.S. Army Corps of Engineers
U.S. Department of Agriculture - Forest Services, San Bernardino County National Forest
California Department of Transportation (Cal Trans)
California Department of Parks and Recreation - Chino Hills State Park
Inland Valley Development Agency, San Bernardino International Trade Center and Airport

B. Hospitals

Bear Valley Community Hospital
Chino Community Hospital
Doctors Hospital
Kaiser Foundation Hospital
Loma Linda Community Hospital
Loma Linda University Medical Center
Mountains Community Hospital
Ontario Community Hospital
Patton State Hospital
U.S. Department of Veterans Affair - Jerry L. Pettis Memorial Veterans Medical Center
Redlands Community Hospital
St. Bernardino Medical Center
San Antonio Community Hospital
San Bernardino Community Hospital
San Bernardino County Hospital

C. Railroads

AT&SF Railway Company
Union Pacific Railroad Company
BNSF Railway Company

D. School Districts

Alta Loma Elementary School District
Bear Valley Unified School District
Central Elementary School District
Chaffey Joint Union High School District
Chino Valley Unified School District
Colton Joint Unified School District
Cucamonga Elementary School District
Etiwanda Elementary School District
Fontana Unified School District
Mountain View Elementary School District

Mt. Baldy joint Elementary School District
Ontario-Montclair Elementary School District
Rialto Unified School District
Rim of the World Unified School District
Redlands Unified School District
San Bernardino City Unified School District
Upland Unified School District
Yucaipa Joint Unified School District

E. **Universities and Colleges**

California State University - California State University San Bernardino
San Bernardino Community College District - Chaffey College Campus
San Bernardino Community College District - Crafton Hills College Campus
San Bernardino Community College District - San Bernardino Valley College Campus
University of Redlands
Loma Linda University

F. **Water Districts**

Big Bear Municipal Water District
Bear Valley Water District
Inland Empire Utilities Agency
Cucamonga Valley Water District
East Valley Water District
Monte Vista Water District
San Bernardino Valley Municipal Water District
San Bernardino Valley Water Conservation District
West San Bernardino County Water District
Yucaipa Valley Water District

G. **Transportation**

Omnitrans
Metrolink (Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto, San Bernardino)
Ontario International Airport (LA/ONT)
Redlands Municipal Airport
Rialto Municipal Airport
Chino Airport
Cable Airport

H. **Other Potential Dischargers**

United States Postal Service
California National Guard
Southern California Edison

Attachment 4: Glossary

Basin Plan – Water Quality Control Plan developed by the Regional Board for the Santa Ana River Watershed.

Beneficial Uses – The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals. "Beneficial Uses" that may be protected against include, but are not limited to: domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)]. Beneficial Uses for the Receiving Waters are identified in the Basin Plan.

Best Available Technology (BAT) – BAT is the acronym for best available technology economically achievable. BAT is the technology-based standard established by congress in CWA section 402(p)(3)(A) for industrial dischargers of storm water. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of treatment and best management practices, or BMPs. For example, secondary treatment (or the removal of 85% suspended solids and BOD) is the BAT for suspended solid and BOD removal from a sewage treatment plant. BAT generally emphasizes treatment methods first and pollution prevention and source control BMPs secondarily.

The best economically achievable technology that will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants is determined in accordance with regulations issued by the Environmental Protection Agency Administrator. Factors relating to the assessment of best available technology shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the permitting authority deems appropriate.

Best Conventional Technology (BCT) – BCT is an acronym for Best Conventional Technology. BCT is the treatment techniques, processes and procedure innovations, and operating methods that eliminate or reduce chemical, physical, and biological pollutant constituents.

Best Management Practices – Best Management Practices (BMPs) are defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.

Bioaccumulate – The progressive accumulation of contaminants in the tissues of organisms through any route including respiration, ingestion, or direct contact with contaminated water, sediment, pore water, or dredged material to a higher concentration than in the surrounding environment. Bioaccumulation occurs with exposure and is independent of the tropic level.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biological Integrity – Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

CalTrans - California Department of Transportation

CEQA – California Environmental Quality Act (Section 21000 et seq. of the California Public Resources Code).

Clean Water Act Section 402(p) – [33 USC 1342(p)] is the federal statute requiring municipal and industrial dischargers to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d) Listed Water Body – is an impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology-based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Co-permittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation

Contamination – As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease." 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not Waters of the U.S. are affected.

Criteria - The numeric values and the narrative standards that represent contaminant concentrations that are not to be exceeded in the receiving environmental media (surface water, ground water, sediment) to protect beneficial uses.

CWA – Federal Clean Water Act

CWC – California Water Code

Debris – Debris is defined as the remains of anything destroyed or broken, or accumulated loose fragments of rock.

Development Projects - New development or redevelopment with land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces, public agency projects, and land subdivision.

Dry Season – June 1 through September 30 of each year, unless specified otherwise in an approved TMDL Implementation Plan.

Effluent Limitations – Means any restriction on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into Waters of the United States, waters of the "contiguous zone," or the ocean. (40 CFR §122.2)

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the Santa Ana River Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the Santa Ana River Basin (1994) and amendments); areas designated as preserves or their equivalent under the Natural Communities Conservation Program (Multiple Species Habitat Conservation Plan, MSHCP) within the Cities and County of San Bernardino; and any other equivalent environmentally sensitive areas which have been identified by the Co-Permittees.

Erosion – The process whereby material (such as sediment) is detached and entrained in water or air and can be transported to a different location. Chemical erosion involves materials that are dissolved and removed and transported.

GIS - Geographical Information Systems

Grading – The cutting and/or filling of the land surface to a desired slope or elevation.

Green Infrastructure - Generally refers to technologically feasible and cost-effective systems and practices that use or mimic natural processes to infiltrate, evapotranspirate, or use stormwater or runoff on the site where it is generated. Green infrastructure is used interchangeably with low impact development (LID). See LID.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the U.S. EPA to be reported if a designated quantity of the material is spilled into the waters of the United States or emitted into the environment.

HCOC – Hydrologic Condition of Concern – Condition when a proposed hydrologic change is deemed to have the potential to cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.

Hydromodification – the "alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources"[90](USEPA, 2007).

[90] United States Environmental Protection Agency. 2007. National Management Measures to Control Nonpoint Source Pollution from Hydromodification. EPA-841-B-07-002.

The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that may result in increased stream flows and sediment transport.

IC/ID – Illicit Connection/Illegal Discharge

Illicit Connection – Illicit Connection means any connection to the MS4 that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations.

Illicit Discharge – Any discharge to a municipal separate storm sewer that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illicit discharge includes all non-storm water discharges except discharges pursuant to an NPDES permit, discharges that are identified in Section V, Effluent Limitations and Discharge Specifications, of this Order, and discharges authorized by the Regional Board.

Impaired Waterbody – Section 303(b) of the CWA requires each of California's Regional Water Quality Control Boards to routinely monitor and assess the quality of waters of their respective regions. If this assessment indicates that Beneficial Uses are not met, then that waterbody must be listed under Section 303(d) of the CWA as an Impaired Waterbody.

Isopluvial - A line on a map drawn through geographical points having the same pluvial (rain, precipitation) index.

Land Disturbance – The clearing, grading, excavation, stockpiling, or other construction activity that results in the possible mobilization of soils or other Pollutants into the MS4. This specifically does not include routine maintenance activity to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. This also does not include emergency construction activities required to protect public health and safety. The Permittees should first confirm with Regional Board staff if they believe that a particular routine maintenance activity is exempt under this definition from the General Construction Activity Storm Water Permit or other Orders issued by the Regional Board.

Load Allocations (LA) – Distribution or assignment of TMDL Pollutant loads to entities or sources for existing and future nonpoint sources, including background loads.

Local Implementation Plan - Document describing an individual Permittee's implementation procedures for compliance with the MS4 Permit, including ordinances, databases, plans, and reporting materials.

Low Impact Development (LID) – A storm water management and land development strategy that combines a hydrologically functional site design with pollution prevention measures to compensate for land development impacts on hydrology and water quality. LID techniques mimic the site predevelopment site hydrology by using site design techniques that store, infiltrate, evapotranspire, bio-filter or detain runoff close to its source

MEP (Maximum Extent Practicable) - Is not defined in the CWA; it refers to management practices, control techniques, and system design and engineering methods for the control of pollutants taking into account considerations of synergistic, additive, and competing factors, including, but not limited to pollutant removal effectiveness, regulatory compliance, gravity of the problem, public acceptance, social benefits, cost and technological feasibility.

MEP is the technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead, the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

Municipal Storm Water Conveyance System – (See Municipal Separate Storm Sewer System or MS4).

Municipal Separate Storm Sewer System (MS4) – MS4 is an acronym for Municipal Separate Storm Sewer System. A Municipal Separate Storm Sewer System is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, natural drainage features or channels, modified natural channels, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes; (ii) Designated or used for collecting of conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollution Discharge Elimination System (NPDES) – A national program under Section 402 of the Clean Water Act for regulation of discharges of pollutants from point sources to waters of the United States. Discharges are illegal unless authorized by an NPDES permit.

NOI [Notice of Intent] – A NOI is an application for coverage under the General Stormwater Permits.

Non-Point Source Pollution (NPS) – Non point source refers to diffuse, widespread sources of pollution. These sources may be large or small, but are generally numerous throughout a watershed. Non Point Sources include but are not limited to urban, agricultural, or industrial areas, roads, highways, construction sites, communities served by septic systems, recreational boating activities, timber harvesting, mining, livestock grazing, as well as physical changes to stream channels, and habitat degradation. NPS pollution can occur year round any time rainfall, snowmelt, irrigation, or any other source of water runs over land or through the ground, picks up pollutants from these numerous, diffuse sources and deposits them into rivers, lakes, and coastal waters or introduces them into ground water.

Non-Storm Water – Non-storm water consists of all discharges to and from a storm water conveyance system that do not originate from precipitation events (i.e., all discharges from a

conveyance system other than storm water). Non-storm water includes illicit discharges, non-prohibited discharges, and NPDES permitted discharges.

NOT - Notice of Termination – Formal notice to the Regional Board of intent to terminate water discharge for projects covered under a General Stormwater Permit.

Nuisance – As defined in the Porter-Cologne Water Quality Control Act a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Numeric Effluent Limitations – A quantitative limitation on pollutant concentrations or levels to protect beneficial uses and water quality objectives of a water body.

Nurdles – A plastic pellet (typically less than 5 mm diameter) also known as pre-production plastic pellet or plastic resin pellet.

Open Space - Any parcel or area of land or water that is essentially unimproved or devoted to an open-space use for the purposes of (1) the preservation of natural resources, (2) the managed production of resources, (3) outdoor recreation, or (4) public health and safety. [Riverside County General Plan, adopted October 7, 2003. Technical Appendix A , Glossary]

Order – Order No. R8-2010-0036 (NPDES No. CAS618036)

Outfall - Means a Point Source as defined by 40 CFR 122.2 a, the point where a municipal separate storm sewer discharges to Waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other Waters of the United States and are used to convey Waters of the United States. [40 CFR 122.26 (b)(9)]

PAH (Polycyclic aromatic hydrocarbon) – are hydrocarbons that consist of fused aromatic rings. PAHs occur in oil, coal, and tar deposits, and are produced as byproducts of fuel burning (whether fossil fuel or biomass). PAHs are persistent, bioaccumulative, and toxic (PBT) pollutants. Though exposure usually occurs by breathing contaminated air, other sources include industrial processes, transportation, energy production and use, and disposal activities.

PCBs - Polychlorinated biphenyls. Due to PCB's toxicity and classification as persistent organic pollutants, PCB production was banned by the United States Congress in 1976 and by the Stockholm Convention on Persistent Organic Pollutants in 2001.

Party – Defined as an individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof. [40 CFR 122.2]

Permittees – Co-permittees and the Principal Permittee

Person – A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. [40 CFR122.2].

Point Source – Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other

floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant – Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated. It includes any type of industrial, municipal, and agricultural waste discharged into water. The term "pollutant" is defined in section 502(6) of the Clean Water Act as follows: "The term 'pollutant' means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." It has also been interpreted to include water characteristics such as toxicity or acidity.

Pollutants of Concern – A list of potential pollutants to be analyzed for in the Monitoring and Reporting Program. This list shall include: TSS, total inorganic nitrogen, total phosphorus, soluble reactive phosphorus, acute toxicity, fecal coliform, total coliform, pH, and chemicals/potential Pollutants expected to be present on the project site. In developing this list, consideration should be given to the chemicals and potential Pollutants available for storm water to pick-up or transport to Receiving Waters, all Pollutants for which a waterbody within the Permit Area that has been listed as impaired under CWA Section 303(d)), the category of development and the type of Pollutants associated with that development category. It also refers to pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with urban runoff. Pollutants commonly associated with urban runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).

Pollution – As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the Waters of the U.S. by waste, to a degree that unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention – Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

Post-Construction BMPs – A subset of BMPs including structural and non-structural controls which detain, retain, filter, or educate to prevent the release of pollutants to surface waters during the final functional life of development.

POTW [Publicly Owned Treatment Works] – Wastewater treatment facilities owned by a public agency.

Principal Permittee – San Bernardino County Flood Control District

Priority Development Projects - New development and redevelopment project categories listed in Section XI.D.4 of Order No. R8-2010-0036.

Rainy Season – October 1 through May 31st of each year.

Receiving Waters – Waters of the United States within the Permit area.

Receiving Water Limitations – Waste discharge requirements issued by the SARWQCB typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Sediment – Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

SIC [Standard Industrial Classification] – Four digit industry code, as defined by the US Department of Labor, Occupational Safety and Health Administration. The SIC Code is used to identify if a facility requires coverage under the General Industrial Activities Storm Water Permit.

Significant Redevelopment –The addition or creation of 5,000, or more, square feet of impervious surface on an existing developed site. This includes, but is not limited to, construction of additional buildings and/or structures, extension of the existing footprint of a building, construction of impervious or compacted soil parking lots. Significant Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, the original purpose of the constructed facility or emergency actions required to protect public health and safety.

Site Design BMPs – Any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's hydrology. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs.

Small Municipal Separate Storm Sewer System (Small MS4)[91] – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that are:

(i) Owned or operated by the United States, a State, city, town, boroughs, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.

(ii) Not defined as "large" or "medium" municipal separate storm sewer systems

(iii) This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings. (40 CFR §122.26(b)(16))

Source Control BMPs – In general, activities or programs to educate the public or provide low cost non-physical solutions, as well as facility design or practices aimed to limit the contact between Pollutant sources and storm water or authorized Non-Storm Water. Examples include: activity schedules, prohibitions of practices, street sweeping, facility maintenance, detection and elimination of IC/IDs, and other non-structural measures. Facility design (structural) examples include providing attached lids to trash containers, canopies for fueling islands, secondary containment, or roof or awning over material and trash storage areas to prevent direct contact between water and Pollutants.

Southern California Stormwater Monitoring Coalition (SMC)

State Board – California State Water Resources Control Board

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Storm Water General Permits – General Permit-Industrial (State Board Order No. 97-03 DWQ, NPDES No. CAS000001), General Permit-Construction (State Board Order No. 99-08 DWQ, NPDES No. CAS000002), and General Permit-Small Linear Underground Projects (State Board Order No. 2003-0007-DWQ, NPDES No. CAS000005).

Structural BMPs – Physical facilities or controls that may include secondary containment, treatment measures, (e.g. first flush diversion, detention/retention basins, and oil/grease separators), run-off controls (e.g., grass swales, infiltration trenches/basins, etc.), and engineering and design modification of existing structures.

SWAMP (Surface Water Ambient Monitoring Program)

SWPPP [Storm Water Pollution Prevention Plan] – Plan to minimize and manage Pollutants to minimize Pollution from entering the MS4, identifying all potential sources of Pollution and describing planned practices to reduce Pollutants from discharging off the site.

[91] State Water Resources Control Board (SWRCB) Water Quality Order No. 2003-005-DWQ, Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (General Permit)

TDS – Total dissolved solids.

Time of concentration - the time that it takes for storm runoff to travel from the most hydraulically remote point of the watershed to the outlet.

Total Maximum Daily Load (TMDL) – The TMDL is the maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under Clean Water Act Section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

TMDL Implementation Plan -- Component of a TMDL that describes actions, including monitoring, needed to reduce Pollutant loadings and a timeline for implementation. TMDL Implementation Plans can include a monitoring or modeling plan and milestones for measuring progress, plans for revising the TMDL if progress toward cleaning up the waters is not made, and the date by which Water Quality Standards will be met (USEPA Final TMDL Rule: Fulfilling the Goals of the CWA, EPA 841-F-00-008, July 2000).

Toxicity – Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Treatment Control BMPs – Any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

TSS – Total suspended solids.

Urban Runoff – Urban runoff is defined as all flows in a storm water conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) authorized non-storm water discharges (See Section V of the Order) (dry weather flows).

USEPA – United States Environmental Protection Agency

Waste – As defined in California Water Code Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system which applies to solid and semi-solid waste which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, nonhazardous solid waste, and inert waste.

Waste Discharge Requirements – As defined in Section 13374 of the California Water Code, the term "Waste Discharge Requirements" is the equivalent of the term "permits" as used in the Federal Water Pollution Control Act, as amended. The Regional Board usually reserves reference to the term "permit" to Waste Discharge Requirements for discharges to surface Waters of the U.S.

Waste Load Allocations (WLA) – Maximum quantity pollutants a discharger of waste is allowed to release into a particular waterway, as set by a regulatory authority. Discharge limits usually are required for each specific water quality criterion being, or expected to be, violated. Distribution or assignment of TMDL Pollutant loads to entities or sources for existing and future point sources.

Water Quality Assessment – Assessment conducted to evaluate the condition of non-storm water and storm water discharges, and the water bodies which receive these discharges.

Water Quality-Based Effluent Limits (WQBEL) - A value determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, and wildlife) for a specific point source to a specific receiving water for a given pollutant.

Water Quality Criteria - comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or states for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.

Water Quality Objective – The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. [California Water Code Section 13050(h)]

Water Quality Standards – are defined as the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of water and the water quality objectives necessary to protect those uses.

Waters of the United States – Waters of the United States can be broadly defined as navigable surface waters and all tributary surface waters to navigable surface waters. Groundwater is not considered to be a Waters of the United States.

As defined in 40 CFR 122.2, the Waters of the U.S. are defined as: (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

Watershed – That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

WDID [Waste Discharge Identification] – Identification number provided by the State when a Notice of Intent is filed.

WQMP – Water Quality Management Plan. A plan developed to mitigate the impacts of urban runoff from Priority Development Projects.

Wet Season – October 1 through May 31st of each year, except where specifically defined otherwise in an approved TMDL Implementation Plan.

Attachment 5: MONITORING AND REPORTING PROGRAM NO. R8-2010-0036 NPDES NO. CAS618036 FOR THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, THE COUNTY OF SAN BERNARDINO, AND THE INCORPORATED CITIES OF SAN BERNARDINO COUNTY WITHIN THE SANTA ANA REGION

AREA-WIDE URBAN AND STORM WATER RUNOFF

Attachment 6: Fact Sheet

Attachment 7: Notice of Intent Municipal Construction Activity

Attachment 8: Notice of Termination Municipal Construction Activity

Attachment 9: Notice of Intent for Municipal De-Minimus Discharges

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

RECEIVING WATERS AND URBAN RUNOFF MONITORING AND REPORTING PROGRAM NO. R8-2010-0036

NPDES NO. CAS618036
FOR
THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, THE COUNTY OF SAN BERNARDINO, AND THE INCORPORATED CITIES OF SAN BERNARDINO COUNTY WITHIN THE SANTA ANA REGION
AREA-WIDE URBAN STORM WATER RUNOFF MANAGEMENT PROGRAM

I. GENERAL

A. Revisions of the monitoring and reporting program are appropriate to ensure that the Permittees are in compliance with requirements and provisions contained in this Order. Revisions may be made under the direction of the Executive Officer at any time during the term of this Order, and may include redistribution of monitoring resources to address TMDL needs, a reduction or increase in the number of parameters to be monitored, the frequency of monitoring, or the number and size of samples collected.

B. The Permittees identified a priority list of pollutants of concern in the watershed based on the findings of water quality monitoring efforts conducted during previous permit terms. These pollutants and their order of priority from high to low were: (1) high priority – bacteria; (2) medium priority - metals (zinc, copper, lead); and (3) low priority - nutrients, TSS and COD. This priority ranking provides the basis for a risk-based approach to stormwater management to direct resources to the most important water quality monitoring activities.

C. All sample collection, handling, storage, and analysis shall be in accordance with 40 CFR Part 136 (latest edition) "*Guidelines Establishing Test Procedures for the Analysis of Pollutants*," promulgated by the USEPA, the guidance being developed by the State Board pursuant to Water Code Section 133383.5, or other methods which are more sensitive than those specified in 40 CFR 136 and approved by the Executive Officer, or methods documented in the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

D. The Executive Officer is authorized to allow the Permittees to participate in statewide, national, or other monitoring programs in lieu of or in addition to this monitoring program. In addition, the Permittees are authorized to complement their urban runoff monitoring data with data from other monitoring sources, provided the monitoring conditions and sources are similar to those in the permitted area.

E. There are two types of monitoring programs that will be referenced and described in this Monitoring and Reporting Program (MRP):

1. An Integrated Watershed Monitoring Program (IWMP) that is to be developed under this MRP. The existing core storm water monitoring program (Core Monitoring) is an integral part of the IWMP. The Core Monitoring program shall be implemented until the new IWMP developed under this order is approved by the Executive Officer; and
2. Regional monitoring efforts where the Permittees participate or make monetary contributions, including TMDL-related monitoring.

F. The Permittees must coordinate monitoring efforts with other entities discharging into the Middle Santa Ana River Watershed and the Big Bear Lake Watershed. Ideally, all monitoring efforts should conform to the same quality assurance, data management, validation, and verification standards, therefore a single coordinated watershed Quality Assurance Program Plan (QAPP) should be used for all monitoring efforts. A previously developed QAPP may be used if an appropriate document exists, such as the Middle Santa Ana River Pathogen TMDL – BMP Implementation QAPP, otherwise a QAPP must be developed for this purpose. The Permittees should cooperate, as appropriate, with other MS4 Permittees (including those in Orange County and Riverside County) in the development of the QAPP, regional monitoring efforts, creation and maintenance of databases, and special studies.

G. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both [40 CFR 122.41(j)(5)]

H. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by an appropriate governmental regulatory agency.

I. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) shall be used for all analyses, unless otherwise specified.

J. The selected water quality monitoring parameters should have a direct relationship to the designated beneficial uses in the receiving waters being monitored.

K. Metals analyses shall be performed on filtered samples in order to obtain concentration of the metals in the dissolved fraction. The detection limits for the metals analyses shall be low enough to allow for a direct comparison to the metal's criteria in the California Toxics Rule.

L. To the extent practicable, all monitoring data and monitoring locations should be integrated into the San Bernardino County GIS database system.

II. OBJECTIVES

A. Objectives: The overall goal of these monitoring programs is to provide data to support the development of an effective watershed and key environmental resources management program that focuses resources on the priority list of pollutants of concern, as defined by the risk-based analysis described in Section I, above, and Finding II.E.22 of Order No. R8-2010-0036. The following are the major objectives:

1. To provide data to support the development of an effective municipal urban runoff pollutant source control program.
2. To determine water quality status, trends, and pollutants of concern associated with urban runoff and their impact on the beneficial uses of the receiving waters. This includes determining current conditions in the receiving waters including the extent and magnitude of any impairments, and relative urban runoff contribution to the impairment.
3. To assist in identifying the sources of the priority list of pollutants of concern_in urban runoff to the maximum extent practicable (e.g., including, but not limited to atmospheric deposition, contaminated sediments, other non-point sources, etc.)
4. To characterize pollutants associated with urban runoff and to assess the influence of urban land uses on receiving water quality
5. To evaluate the effectiveness of existing urban runoff water quality management programs, including an estimate of pollutant reductions achieved by the treatment and source control BMPs implemented by the Permittees.
6. To detect illegal discharges and illicit connections to the MS4s so they can be responded to or eliminated.
7. To identify those waters, which without additional action to control pollution from urban storm water discharges, cannot reasonably be expected to attain or maintain applicable water quality objectives in the Basin Plan.
8. To identify and prioritize the most significant water quality problems resulting from urban runoff. Order No. R8-2010-0036 establishes new program monitoring priorities through the development and implementation of a risk-based, outcome-oriented, compliance-focused program. Monitoring and sampling data shall be used to identify and prioritize the most significant water quality problems in receiving waters.
9. To evaluate costs and benefits of proposed municipal storm water quality control programs to the stakeholders, including the public.

B. The Regional Board recognizes that program modifications may be necessary to attain these objectives. The Executive Officer is hereby authorized to evaluate and to determine adequate progress toward meeting each objective and to make any modifications to the monitoring and reporting program.

III. QUALITY ASSURANCE PROGRAM PLAN (QAPP)

A. Except for TMDL monitoring where TMDL specific quality assurance plans[1,2] have been developed or will be developed, the Permittees shall submit to the Executive Officer of the Regional Board for review and approval a quality assurance/quality control plan that has been developed by qualified professionals with experience in US EPA's and California's SWAMP QAPP guidelines.

B. The QAPP shall and address all elements for the SWAMP QAPP guidelines. Data collection, field and laboratory protocol, measurements, and analysis shall be compatible with SWAMP Quality Assurance Management Plan (QAMP[3]) and with Procedures for Conducting Routine Field Measurement.

C. Where procedures are not otherwise specified in this MRP, sampling, analysis and quality assurance/quality control must be conducted in accordance with the QAMP for SWAMP.

D. For priority toxic pollutants, if the Permittees can demonstrate that a particular ML (Minimum Level) is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Principal Permittee must submit documentation from the laboratory to the Regional Water Board Executive Officer for approval prior to utilizing a ML that is not consistent with the MLs in the SIP.

E. The indicators of water quality selected for monitoring shall be representative of the beneficial uses in the receiving water bodies in the permittees jurisdiction.

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[1] SAWPA, Quality Assurance Project Plan for the Middle Santa Ana River Pathogen TMDL-BMP Implementation Project, April 3, 2008

[2] Big Bear Municipal Water District, Integrated Total Maximum Daily Load Implementation Program for Big Bear Lake, Quality Assurance Project Plan, April 24, 2006

[3] See State Board's SWAMP at http://www.swrcb.ca.gov/water_issues/programs/swamp/qamp.shtml

IV. INTEGRATED WATERSHED MONITORING PROGRAM (IWMP)

A. GENERAL

1. Within 12 months of adoption of this Order, the Principal Permittee, in coordination with the Co-Permittees shall review, revise as needed, and submit an Integrated Watershed Monitoring Plan (IWMP) for review and approval by the Executive Officer. At a minimum, the IWMP shall include the essential elements specified below. The IWMP shall identify all the monitoring programs, along with implementation and reporting schedules that are conducted or participated in to fulfill the monitoring objectives of this Order. The approved IWMP shall be implemented within six months of approval by the Executive Officer. In the interim, the Permittees shall continue to implement the Core Monitoring program approved under the third-term permit and any additional monitoring required under this Order.

B. COMPONENTS OF AN INTEGRATED WATERSHED MONITORING PROGRAM:

The IWMP shall, at a minimum, include the following components:

1. **EXISTING CORE MONITORING** - The current municipal stormwater monitoring for San Bernardino County until it is modified by the IWMP. This consists of receiving water monitoring and monitoring within the MS4s (See Figure 1).

   a. Receiving Water Monitoring:

      Permittees shall select a number of representative receiving water locations within their jurisdiction. These locations should be close to MS4 discharge points and should include locations where chronic and/or persistent water quality problems have been identified. The objective of receiving water monitoring is to determine if urban runoff is causing or contributing to violations of water quality standards in the receiving waters.

   b. Monitoring within MS4s:

      Permittees shall select a number of representative locations (representative of flow, duration, pollutant loads, etc.) within storm water conveyance systems within their jurisdiction. The objective of this monitoring element is to determine the pollutant loads from the MS4s and to determine their trend. This monitoring requirement maybe combined with the mass emissions monitoring described in 2, below.

2. **URBAN DISCHARGE MASS EMISSIONS MONITORING:**

   a. Representative outfall locations shall be identified and monitored to achieve the following objectives:

i. To estimate the total mass emissions of pollutants of concern from the MS4 to receiving waters.

ii. To assess trends in mass emissions associated with urban storm water runoff from the MS4s over time and evaluate potential correlations between any trends in mass emission and land use and population changes.

iii. To determine if the MS4 is contributing to exceedances of water quality standards, by comparing outfall and receiving water results to: (1) Basin Plan Water quality Objectives (WQOs); (2) EPA storm water benchmarks contained in the EPA Multi-Sector Industrial Storm Water Permit; (3) California Toxic Rule (CTR); and (4) other MS4 discharge monitoring data.

b. At least two samples shall be collected from the monitoring locations identified in a, above, during dry weather conditions and one sample from the first storm event of the rainy season (October 1 to May 31) and two more samples during subsequent storm events. The mass emissions monitoring locations shall be monitored for:

i. The flow in cubic feet per second (cfs) (the flow may be estimated);

ii. The samples from the first storm event and one of the dry weather samples shall be analyzed for the entire suite of priority pollutants. All samples must be analyzed for E. coli, nutrients (nitrates and nitrites, potassium, and phosphorous), metals, pH, TSS, TOC, organophosphorus pesticides/herbicides, and any other constituents that are known to have contributed to impairment of local receiving waters by inclusion on the 303(d) list. Dry weather samples shall be also analyzed for total petroleum hydrocarbons (EPA Method 8015M - direct injection) and oil and grease.

iii. A mass loading model shall be used to calculate the mass loadings and to the extent practicable the data shall be integrated into the San Bernardino County GIS database system.

3. ILLEGAL DISCHARGE/ILLICIT CONNECTION MONITORING

a. The Permittees shall review and update their dry and wet weather reconnaissance strategies to identify and eliminate illegal discharges and illicit connections using the Guidance Manual for Illicit Discharge, Detection, and Elimination developed by the Center for Watershed Protection[4] or any other equivalent program. The Permittees should identify appropriate monitoring locations, such as geographic areas with a high density of industries associated with gross pollution (e.g. electroplating industries, auto dismantlers) and/or locations subject to maximum sediment loss (e.g. hillside new developments).

[4] USEPA (Illicit Discharge Detection and Elimination - A Guidance Manual for Program Development and Technical Assessments) by the Center for Watershed Protection and Robert Pitt, University of Alabama, October 2004, updated 2005).

b. The dry weather monitoring for nitrogen and total dissolved solids shall be included as part of the illegal discharge/illicit connection monitoring program. In light of the recently adopted Nitrogen-TDS objectives for certain management zones, the Permittees shall, within 18 months of Permit adoption, submit a plan to determine baseline concentration of these constituents in dry weather runoff, if any, from significant outfall locations (36 inches or larger in diameter).

4. HYDROMODIFICATION MONITORING PLAN (HMP)

This Order requires development and implementation of a Hydromodification Monitoring Plan as part of the Watershed Action Plan (WAP) to evaluate hydromodification impacts for the drainage channels deemed most susceptible to degradation, and, where applicable the effectiveness of BMPs in preventing or reducing impacts from hydromodification within the permitted area. (Some or all of the following requirements may be satisfied by the Permittees participation in the "Development of Tools for Hydromodification Assessment and Management' Project" undertaken by the SMC and coordinated by SCCWRP).

a. The Order requires the Permittees to develop a WAP within 12 months of Permit adoption (phase 1) and 12 months following approval of phase 1 (phase 2). The WAP should identify vulnerable streams and possible control measures to minimize hydrologic changes and tools to measure any impacts on geomorphology and aquatic resources.

b. The HMP shall include:

   i. Protocols for ongoing monitoring to assess drainage channels deemed most susceptible to degradation, and to assess the effectiveness in preventing or reducing impacts from hydromodification within the permitted area.

   ii. Models to predict the effects of urbanization on stream stability within the permitted area.

5. SOURCE IDENTIFICATION AND SPECIAL STUDIES

a. The ROWD identified a priority list of pollutants of concern in the watershed based on the findings of water quality monitoring efforts. These pollutants and their order of priority from high to low were: (1) high - bacteria, (2) medium - metals (zinc, copper, lead), (3) low - nutrients (nitrate as nitrogen, total phosphorus), TSS and COD. During the Permit term, the Permittees shall assess each of the pollutants considered a concern (except bacteria, which is already being addressed by a TMDL) and prepare a strategic plan for addressing each pollutant. For some pollutants such as the metals, special studies for the development of site-specific objectives or total recoverable/ dissolved translators may be necessary.

b. During the third-term permit, a Pollutant Source Investigation and Control Plan[5] was developed and implemented to investigate elevated pollutant concentrations of coliform bacteria, zinc, copper and lead at Site 5. This Order requires continued implementation of the plan, including annual reporting and BMP effectiveness evaluation for the Site 5 drainage area.

V. REGIONAL WATERSHED MONITORING

A. Regional watershed monitoring refers to the collaboration among many agencies in and around southern California in addition to municipal stormwater agencies that are interested in watershed to regional scale monitoring. Regional monitoring can be used to assess the cumulative results of anthropogenic and natural effects on the environment and provides opportunities for comparison of the different stormwater agencies' monitoring to determine the breadth and depth of human impacts and natural variability found throughout southern California's watersheds. See Section V.B.3 below for Regional Bioassessment monitoring,

1. Some of these regional monitoring programs include the Statewide Ambient Monitoring Program (SWAMP), State Wetland's Recovery Project, USEPA Environmental Monitoring and Assessment Program (EMAP), and US Geological Survey's National Water Quality Assessment Program (NAWQA).
2. A number of regional organizations continue work in the Santa Ana River Watershed area, including the SWQSTF, SMC, SCCWRP, and universities. Participation in water-related studies or planning efforts, which may include monitoring, provides valuable information for the area-wide monitoring program. The Permittees shall participate in these regional efforts including the following:
   a. TMDL Monitoring
   b. Low Impact Development BMP Monitoring
   c. Regional Bioassessment Monitoring (SCCWRP Technical Report 539)

B. Regional Monitoring Plans

1. TMDL/WLA MONITORING

The Permittees shall continue to participate in TMDL monitoring programs to determine compliance with the waste load allocations (WLAs). The compliance schedules for the approved TMDLs within the permitted area are beyond the five-year permit term. This Order requires Permittees to conduct monitoring to determine the effectiveness of the BMPs implemented in reducing pollutant loads and eventually to attain WLAs by the deadlines specified in the TMDL implementation plans.

[5] 2005-2006, 2006-2007, 2007-2008 Annual Reports

Since the compliance dates for the TMDLs in this Order are outside the five-year term of this Order, the Permittees are required to monitor and report effectiveness of the BMPs specified in the TMDL Implementation Plans and this Order with respect to pollutant reduction goal(s) as one measure of progress towards attainment of WLAs in accordance with the compliance schedules specified in the TMDL Implementation Plans. If water quality standards in the impaired receiving waters are met through implementation of appropriate control measures, this would constitute compliance with the WLAs.

a. MSAR Bacteria TMDL/WLA Monitoring Plan (Figures 2 & 3)

i. On June 14, 2007, the TMDL task force members submitted a source evaluation plan and a monitoring plan. The Regional Board approved these plans on June 29, 2007, Resolution No. R8-2007-0046. A revised monitoring plan and an urban bacterial indicator source evaluation plan were approved by the Regional Board on April 18, 2008, Resolution No. R8-2008-0044 (See Figures 2 and 3). The MSAR Permittees within the MSAR watershed shall continue to conduct monitoring and source evaluations in accordance with the approved plans and report the findings in accordance with the schedules specified in the approved plans or as updated by subsequent Regional Board approved revisions.

ii. In conformance with Task 3 of the TMDL Implementation Plan contained in Resolution R8-2005-0001, the Permittees shall individually, or in conjunction with the MSAR TMDL Task Force, prepare a triennial report summarizing the data collected for the preceding 3 year period and evaluating compliance with the WLAs. The first report shall be due February 15, 2010.

iii. The Pemittees shall conduct monitoring and reporting consistent with Section V.D. of this Order to evaluate the effectiveness of the BMPs implemented in the watershed and determine their progress towards attaining compliance with the interim WQBELs, and final BMP-based WQBELS, if approved, or the final numeric WQBELS/WLAs.

b. Big Bear Lake Watershed Wide Nutrient Monitoring Plan (Figure 4)

i. For each year of in-lake nutrient and water quality monitoring under the approved plans[6], the results shall be summarized in an annual report and submitted to the Executive Officer. The Big Bear Lake Nutrient TMDL annual report is due to the Executive Officer by February 15th of each year.

ii. Currently, the Big Bear Lake MS4 Permittees are meeting the WLAs. In the future, continued compliance with the phosphorus WLA will be determined by watershed modeling. By March 31, 2010, the Big Bear Lake MS4 Permittees shall submit a final watershed modeling plan that is ready to be

[6] The 2006 Integrated TMDL Implementation Program for Big Bear Lake QAPP applies to the existing monitoring plans: Big Bear Lake Monitoring Plan, Tributary Monitoring Plan, East End Nutrient/Sediment Removal Monitoring Plan, and Bacteria Monitoring Plan

implemented and that details how the WLA will be determined and evaluated in future years. Upon approval by the Executive Officer, this watershed modeling plan shall be used to determine compliance with the WLA. The Big Bear Lake MS4 Permittees shall select a watershed model that best fits the conditions they are modeling and document the basis for that selection. Data collected under the approved watershed monitoring program shall be evaluated by the Big Bear Lake MS4 Permittees to determine if it falls within the range of dry hydrological conditions as specified in the Nutrient TMDL. The Big Bear Lake MS4 Permittees shall utilize data collected from the monitoring locations specified in the watershed monitoring program approved on May 22, 2009, as well as any other data that are deemed necessary to calibrate and validate the watershed model. The Big Bear Lake MS4 Permittees will document the basis for the selection of the model, the data evaluation and selection process, and the model calibration/validation process. The Big Bear Lake MS4 Permittees or the Big Bear TMDL Task Force, shall provide the results of the first model update by February 15, 2011, and every three years thereafter.

iii. An iterative approach is appropriate to demonstrate compliance with the phosphorus WLA in drainage areas tributary to Big Bear Lake.

iv. If watershed modeling determines exceedances of the phosphorus WLA, despite implementation of the lake management plan and the MSWMP and other requirements of this Order, the Big Bear Lake MS4 Permittees shall comply with the following procedure:

1. Each Big Bear Lake MS4 Permittee[7] upstream of the monitoring locations shall evaluate and characterize discharges from its significant outfall locations.
2. The Big Bear Lake MS4 Permittees[8] shall submit a report with proposed actions to the Executive Officer that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce pollutants that are causing or contributing to the exceedances of the WLA.
3. The report may be incorporated into the storm water annual report.

2. LOW IMPACT DEVELOPMENT (LID) BMP MONITORING

The Principal Permittee shall continue to participate in data collection and monitoring to assess the effectiveness of LID techniques in semi-arid climate as part of the SMC project titled, "Quantifying the Effectiveness of Site Design/ Low Impact Development Best Management Practices in Southern California".

[7] This task may be completed by the Big Bear TMDL Task Force.
[8] This task may be completed by the Big Bear TMDL Task Force.

3. REGIONAL BIOASSESSMENT MONITORING (SCCWRP TECHNICAL REPORT 539[9])

The Principal Permittee, on behalf of the co-Permittees, participates (through a memorandum of understanding and cooperative agreements) with the 16 member agencies of the Storm Water Monitoring Coalition (SMC) Bioassessment Working Group to conduct bioassessments on a regional basis. The Principal Permittee in coordination with SCCWRP shall ensure that a sufficient number of monitoring stations are selected for this program from locations within the permitted area.

a. The objectives of the Regional Watershed Monitoring Program overseen by the State Board's Storm Water Ambient Monitoring Program (SWAMP) and the Storm Water Monitoring Coalition (SMC) and coordinated by the Southern California Coastal Water Research Project (SCCWRP) are:
   i. To assess the current status of streams in Southern California.
   ii. To identify major stressors to aquatic life.
   iii. To monitor the trend in water quality in Southern California streams.

b. The Principal Permittee, in collaboration with the SMC, shall conduct sampling, analysis, and reporting of specified instream biological and habitat data within the 5-year permit cycle according to the protocols specified in the SCCWRP Tech Report No. 539.

c. The bioassessment shall provide information about the biological integrity of receiving waters. Baseline and trend monitoring information on the biotic and geomorphological condition of the receiving waters shall be used to evaluate the effectiveness of the storm water pollution control measures.

d. The sampling sites in each watershed unit were determined according to distribution or abundance of the three land uses: urban, agriculture, or open. Within the San Bernardino County permitted area (considered as 1.5 watershed unit), the Principal Permittee, shall ensure the collection of at least 9 samples/year.

e. Sampling events shall be conducted between 4 to 12 weeks following the last significant rainfall. No sampling shall occur within 72 hours of any measurable rainfall. The default index period will be from May 15 to July 15.

f. For long-term trend monitoring, the Principal Permittee shall ensure the collection of a minimum of one sample per year during the dry weather index period from Station ID WW-S1, Santa Ana River Reach 3 at the MWD crossing. Additional samples may be collected to improve data quality for trend analysis.

[9] "The Regional Monitoring of Southern California's Watershed SMC Bioassessment Working Group", SCCWRP, Technical Report No. 539, December 2007

At a minimum, water chemistry and aquatic toxicity should be used as indicators for trend analysis.

g. The SCCWRP Technical Report No. 539 specifies six indicators as assessment tools, including aquatic toxicity using *Ceriodaphnia dubia*, water flea. The aquatic toxicity studies shall be conducted using USEPA approved methods. If conductivity is too high for survival of control organisms, then *Hyalella spp*, freshwater amphipod, may be used as a test species.

VI. RECORD KEEPING REQUIREMENTS

A. All monitoring activities shall meet the following requirements :

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR 122.41(j)(1)]. Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored discharge, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality in the case of storm channels and flow quality in the case of streams and lakes. Representative sampling also includes development of a testable hypothesis, appropriate site selection, applicable and accepted sampling methodologies, laboratory methods, and frequency of sampling.

2. The Permittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports prepared as per this MRP and records of all data used to complete the Report of Waste Discharge and annual reports for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge [40 CFR 122.41(j)(2), CWC section 13383(a)].

3. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:
   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

4. Calculations for all effluent limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this MRP [40 CFR 122.41(l)(4)(iii)].

5. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both [40 CFR 122.41(k)(2)].

VII. PROGRAM EFFECTIVENESS ASSESSMENT AND REPORTING

A. All progress reports and proposed strategies and plans required by this order shall be signed by the Principal Permittee, and copies shall be submitted to the Executive Officer under penalty of perjury.

B. The Principal Permittee has been monitoring urban runoff and receiving waters since the first MS4 permit term. It is recognized that some of the objectives noted in Section II may not have been fully attained during the previous MS4 permit terms. With the first annual report due after adoption of this Order, the Principal Permittee must submit an evaluation of the progress achieved to date and propose modifications to the monitoring program to achieve full compliance with the objectives of this monitoring program, discussed in Section II.

C. The Permittees shall be responsible for the timely submittal to the Principal Permittee of all required information/materials needed to comply with this Order. All such submittals shall be signed by a duly authorized representative of the Permittee under penalty of perjury.

D. The data transmittals to the Regional Board shall be in the form developed by the Storm Water Monitoring Coalition (SMC) and approved by the State Water Resources Control Board in the document entitled "Standardized Data Exchange Formats". This document was developed in order to provide a standard format for all data transfer so that data can be universally shared and evaluated from various programs.

E. The Permittees shall submit an annual progress report to the Executive Officer and to the Regional Administrator of the USEPA, Region 9, no later than November 15th, of each year. This progress report may be submitted in a mutually agreeable electronic format. At a minimum, annual progress report shall include the following:

1. A review of the status of program implementation and compliance (or non-compliance) with the schedules contained in this Order;

2. An assessment of the effectiveness of control measures established under the illicit discharge elimination program and the Municipal Storm Water Management Plan (MSWMP). The effectiveness may be measured in terms of how successful the program has been in eliminating illicit/illegal discharges and reducing pollutant loads in storm water discharges;

3. As assessment of control measures and their effectiveness in addressing pollutants causing or contributing to an exceedance of water quality objectives in receiving waters that are on the 303(d) list of impaired waters. The effectiveness evaluation shall consider changes in land use and population on the quality of receiving waters and the impact of development on sediment loading within receiving waters and recommend necessary changes to program implementation and monitoring needs.

4. The annual report shall include an overall program assessment. The Permittees are encouraged to use the program assessment methodology described in the 2006 ROWD. The Permittees should determine, to the extent practicable, water quality improvements and pollutant load reductions resulting from implementation of various program elements. The Permittees may also use the "Municipal Storm Water Program Effectiveness Assessment Guidance" developed by the California Storm Water Quality Association in May 2007 as guidance for assessing program effectiveness at various outcome levels. The assessment should include each program element required under this Order, the expected outcome, and the measures used to assess the outcome. The Permittees may propose any other methodology for program assessment using measurable targeted outcomes.

5. The annual report shall include a status report on the development and implementation of the Hydromodification Monitoring Program developed as part of the WAP.

6. Each Permittee shall develop, update, implement, and review its local implementation plan (LIP) to address program modifications and improvements identified during the program assessment.

7. A summary and analysis of monitoring results from the previous year and any changes to the monitoring program for the following year;

8. A financial summary report as described in Section XIX.B of this order; including:
   a. Each Permittee's expenditures for the previous fiscal year;
   b. Each Permittee's budget for the current fiscal year;
   c. A description of the source of funds.

9. A draft workplan which describes the proposed implementation of the LIPs, and MSWMPs for next fiscal year. The workplan shall include clearly defined tasks, responsibilities, and schedules for implementation of the storm water program and each Permittee's action plans for the next fiscal year;

10. Major changes to any of the previously submitted plans/policies; and

11. An assessment of the Permittees compliance status with the Receiving Water Limitations, Section VI of the Order, including any proposed modifications to the MSWMP and WQMP if the Receiving Water Limitations are not fully achieved.

VIII. REPORTING SCHEDULE

All reports required by this Order shall be submitted to the Executive Officer in accordance with the following schedule:

Reporting Schedule (Order R8-2010-0036)			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
III.A.1.n	Principal Permittee shall coordinate a review of areawide documents to determine the need for update or revisions	within 18 months of adoption of this Order	
III.A.1.0	Principal Permittee shall develop and implement a model Local Implementation Plan (LIP) each program element as described per the MSWMP	within 6 months of adoption of this Order	
III.A.2.a	Principal Permittee shall develop and implement a Principal Permittee-specific LIP, based on the areawide model LIP	within 18 months of adoption of this Order	
III.B.1	Permittees to develop and implement a Permittee-specific LIP for its jurisdiction. The LIP shall describe the Permittee's legal authority, its ordinances, policies and standard operating procedures; identify departments and personnel for each task and needed tools and resources.	within 18 months of adoption of this Order	
III.B.2.e	Each Permittee shall review and revise its MS4 facility maps	As needed	Annually
III.C	Permittees shall evaluate the storm water management structure and the Implementation Agreement and determine the need for any revision	As needed	Annually
V.D.1.a.ii	MSAR Permittees shall submit MSAR reports of watershed-wide monitoring program for wet and dry season respectively	May 31 and Dec 31	Starting in 2010, annually thereafter
V.D.1.a.iii	MSAR Permittees shall submit MSAR comprehensive reports	Feb 15	Starting in 2010 and every three years thereafter
V.D.1.a.iv	MSAR Permittees shall submit MSAR semi-annual reports	January 31 & July 31	Annually
V.D.1.a.v	MSAR Permittees shall revise MSWMP in accordance with MSAR-TMDL Implementation program	Nov 15, 2010	Annual report

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
V.D.1.a.vi	MSAR Permittees shall revise the WQMP in accordance with MSAR-TMDL implementation program	Nov 15 of every year	Annual report
V.D.1.a.vii	MSAR Permittees shall amend the LID in accordance with the revised MSWMP/WQMP	Within 90 days after RB approves revisions	Nov 15 of each year
V.D.2.b.ii	MSAR Permittees shall prepare for approval the draft CBRP to achieve compliance for Dry Weather Conditions	December 31, 2010	
V.D.2.b.ii	MSAR Permittees shall submit Final version of CBRP	90 days after receiving comments from the Regional Board	
V.D.4.e	Big Bear Lake MS4 Permittees shall submit a plan of various in-lake treatment technologies	No later than February 26, 2010	
V.D.4.f	Big Bear Lake MS4 Permittees shall submit for approval a plan and schedule for updating the existing Big Bear Lake watershed nutrient model and the Big Bear Lake in-lake nutrient model	No later than March 31, 2010	
V.D.4.g	Big Bear Lake MS4 Permittees shall submit for approval a proposed plan and schedule for in-lake sediment nutrient reduction for Big Bear Lake	No later than April 15, 2010	
V.D.4.i	The Big Bear Lake-Lake Management Plan shall be reviewed and revised as necessary at least once every three years	As necessary, at least once every 3 years	
V.D.4.j	Big Bear Lake MS4 Permittees shall submit annual report summarizing data from water quality monitoring programs and evaluating compliance (Big Bear Lake TMDL)	February 15, 2010	Annually
V.D.2.b.ii	MSAR Permittees shall prepare for approval the draft CBRP to achieve compliance for Dry Weather Conditions	December 31, 2010	
V.D.4.k	Big Bear Lake MS4 Permittees shall submit final watershed modeling plan to be implemented (Big Bear Lake TMDL)	March 31, 2010	
V.D.4.k	Big Bear Lake MS4 Permittees shall provide results of the first model update	February 15, 2011	
V.D.4.l	Big Bear Lake MS4 Permittees shall revise MSWMP, WQMP, LIP as necessary	November 15	Annual report
V.D.4.m.2	Big Bear Lake MS4 Permittees shall submit report to EO describing BMPs to reduce sources of phosphorous	November 15	Annual report

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
V.D.4.n	Revise LIP to incorporate requirements from TMDL implementation	As needed	As necessary
V.D.5.a	City of Big Bear Lake shall continues to implement Phase 2 monitoring program	on-going	on-going
VI.D	If there is discharge causing or contributing to exceedance, Permittees shall notify either by phone or by e-mail and, thereafter submit a report satisfying D.a to D.e	Within 30 calendar days	
VI.E	Permittees shall submit any modifications, if required by the Executive Officer	Within 30 calendar days of notification	
VI.F	Permittees shall revise the storm water management programs (MSWMP and LIP) and monitoring program to incorporate the additional BMPs that will be implemented	Within 60 calendar days following EO approval	
VII.D	Permittees shall promulgate ordinances that would specify control measures for known pathogen or bacterial sources such as animal wastes if those types of sources are present within their jurisdiction.	Within 3 years of Order adoption	
VII.F	The Permittees shall notify owners of other MS4 systems outside the Permittees' jurisdiction, regarding the regulatory requirements for control of pollutants in MS4 discharges and provide copy to the Regional Board.	Annually	
VII.G	The Permittees shall review water quality ordinances and evaluate effectiveness	Annually	Annual Report
VII.J	The Permittees shall submit a certification statement signed by legal counsel, that the Permittee has obtained all necessary legal authority	Within one (1) year of Order adoption	
VII.K	The Permittees shall review adequacy of ordinances, implementation and enforcement response procedures with respect to the above items.	Annually	Annual Report
VIII.A	The Permittees shall develop pro-active IC/ID Program		Annual Report
IX.F	Permittees with septic systems in their jurisdiction shall develop an inventory of septic systems within its jurisdiction and establish a program to ensure that failure rates are minimized	Within two years of Order adoption	
X.A.3	The Permittees shall update database and inventory system containing inspections, facilities	at least once/year	Annually

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
X.A.4	The Permittees shall Develop risk-based, compliance focused strategy for inspection of construction, industrial, and municipal facilities	within 18 months of Order adoption	
X.A.12	The Permittees shall Document, evaluate and report the effectiveness of enforcement procedures in achieving prompt and timely compliance.	annually	Annual Report
X.D.6	The Permittees shall Principal Permittee shall notify all mobile businesses operating within the County concerning the minimum source control and pollution prevention measures	Within 36 months of adoption of this Order	
X.D.7	The Principal Permittee, in coordination with the Permittees shall develop an enforcement strategy to address mobile businesses	Within 36 months of adoption of this Order	
X.E.1	Each Permittee shall develop and implement a residential program to reduce the discharge of pollutants from residential facilities to the MS4s to the maximum extent practicable	Within 36 months of adoption of this Order	
X.E.7	The Permittees shall evaluate residential program effectiveness	First annual report after adoption of Order	Annual report
XI.B.3.a	The Principal Permittee shall develop a Watershed Action Plan, Phase 1	Within 12 months of adoption of this Order	
XI.B.3.b	The Principal Permittee shall develop a Watershed Action Plan, Phase 2	Within 12 months of approval of Exec, Officer of Phase 1 report.	

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
XI.B.4	The Permittees shall review the watershed protection principles and policies in the General Plan or related documents (such as Development Standards & Project Guidance, Zoning Codes, Conditions of Approval,) to determine consistency with the Watershed Action Plan.	Within three years of Order adoption	Annual Report
XI.B.4	The Permittees shall report the above findings and schedule of revisions	Annually	Annual Report
XI.C.4	Each Permittee shall incorporate the results of the above information into its LIP and its project approval process.	Within 24 months of adoption of this Order	
XI.D.2	The Principal Permittee shall coordinate the revision of the WQMP Guidance and Template to include new elements required under this Order.	Within 18 months of adoption of this Order	
XI.E.1	Each Permittee shall identify barriers to implementing LID	Within 18 months of adoption of this Order	
XI.E.2	Each Permittee shall provide Regional Board a copy of its report to DWR on its updated landscaped ordinance.	Simultaneous with notification to DWR	
XI.E.5	The Permittees shall review and update the Water Quality Management Plan Guidance and Template to incorporate LID principles	Within 18 months of adoption of this Order	
XI.E.9	The Permittees shall submit a copy of the updated Water Quality Management Plan Guidance and Template for review and approval by the Executive Officer.	Within 18 months of adoption of this Order	
XI.F.1	The Permittees shall develop standard design and PCBMP guidance for municipal road projects	Within 24 months of adoption of this Order	
XI.G.1	Permittees may grant waiver of BMPs with justification documents to the EO	Within 30 days prior to Permittee approval	

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
XI.H.1 & H.4	The Permittees shall develop and implement standard procedures and tools, such as WQMP checklist, project close-put procedures, and include in the LIP.	Within 18 months of adoption of this Order	
XI.I.2	The Permittees shall conduct follow-up inspection of the post-construction BMPs	Prior to the rainy season within 3 years	Every 3 years thereafter.
XI.J	The Permittees shall establish mechanism to track project ownership		Annual Report
XI.K.2	The Permittees shall develop a database to track operation and maintenance of post-construction BMPs.	Within 12 months of adoption of this Order	
XII.E	The Permittees shall develop and maintain BMP guidance for the control of those potentially polluting activities including guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, and guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting.	Within 12 months of adoption of this Order	
XIII.E	The Permittees shall evaluate,the inspection and cleanout frequency of drainage facilities,	Annually	Annual report
XV.B	The Permittees shall notify the EO of proposed de-minimus type of discharges by submitting a NOI	At least 15 days before de-minimus discharge	
XVI.A.1 & A,2	The Principal Permittee shall update, revise and develop a training program including a training schedule, curriculum content, and defined expertise and competencies for storm water managers, inspectors, maintenance crew, municipal contractors, those involved in the review and approval of WQMPs, and those preparing and/or reviewing CEQA documentation	Within 24-48 months of adoption of this Order	

Reporting Schedule (Order R8-2010-0036) Continued			
Permit No.	**ITEM**	**COMPLETION TIME AFTER PERMIT ADOPTION OR FREQ.**	**REPORT DUE DATE**
XVI.D	The Principal Permittee shall provide and document training to applicable public agency staff on the updated Municipal Activities and Pollution Prevention Strategy (MAPPPS). and any other applicable guidance and procedures	Annually	Annual Report
XVI.H	Each Permittee shall adequately train any of its staff involved with storm water related projects and the implementation of this Order	Within 6 months after assignment then annually prior to rainy season	Annual report
XVIII.B	Permittees shall evaluate the MSWMP to determine the need for any revisions in Order to reduce pollutants in MS4 discharges to the maximum extent practicable.	Annual Report	October 1
XIX.B	Permittees shall prepare and submit a financial summary to the Executive Officer of the Regional Board	Annually	
XXII.A	Permittees shall prepare and submit ROWD permit renewal application		No later than 180 days of Permit expiration
MRP IV. A	Permittees shall review, revise as needed, and submit the Integrated Watershed Monitoring Plan (IWMP) for review and approval by the Executive Officer.	Within 12 months of adoption of this Order	
MRP IV.B.3.b	Permittees shall submit a plan to determine baseline concentrations of N/TDS	Within 18 months of Order adoption	
MRP V. B.1.a.ii	Permittees shall revise the MSWMP to incorporate a plan and a schedule to achieve necessary triennial bacterial source reduction for meeting the phosphorus indicator WLAs	February 15, 2010	Annual Report

Date: 1-29-10

Ordered by G J Thibeault
Gerard J. Thibeault
Executive Officer

Figure 1: Current Stormwater Core Monitoring Stations (Sites 2, 3, 5, 8, and 10)

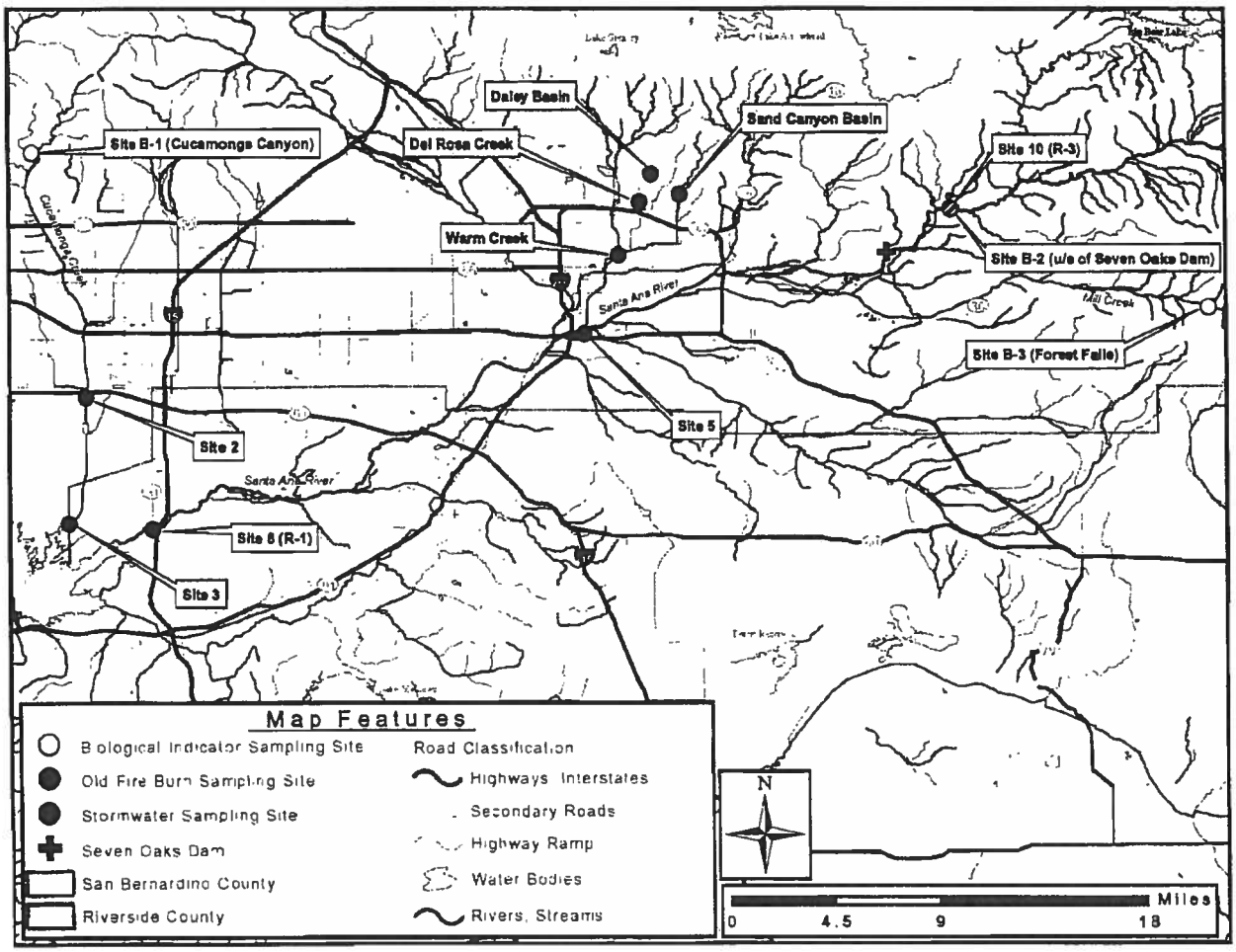


Figure 2: MSAR TMDL Watershed-wide Monitoring Locations

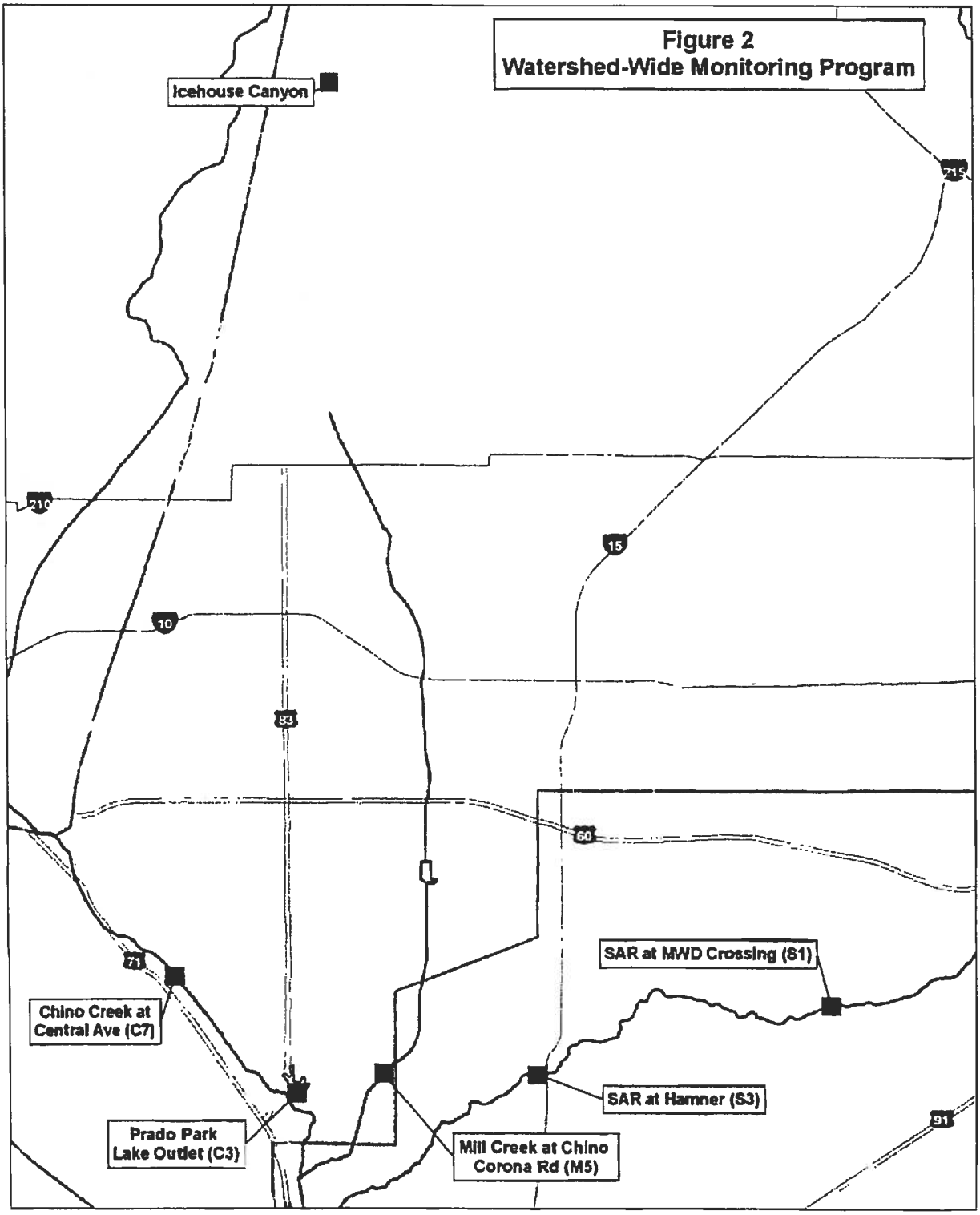


Figure 3: MSAR TMDL USEP Monitoring Locations

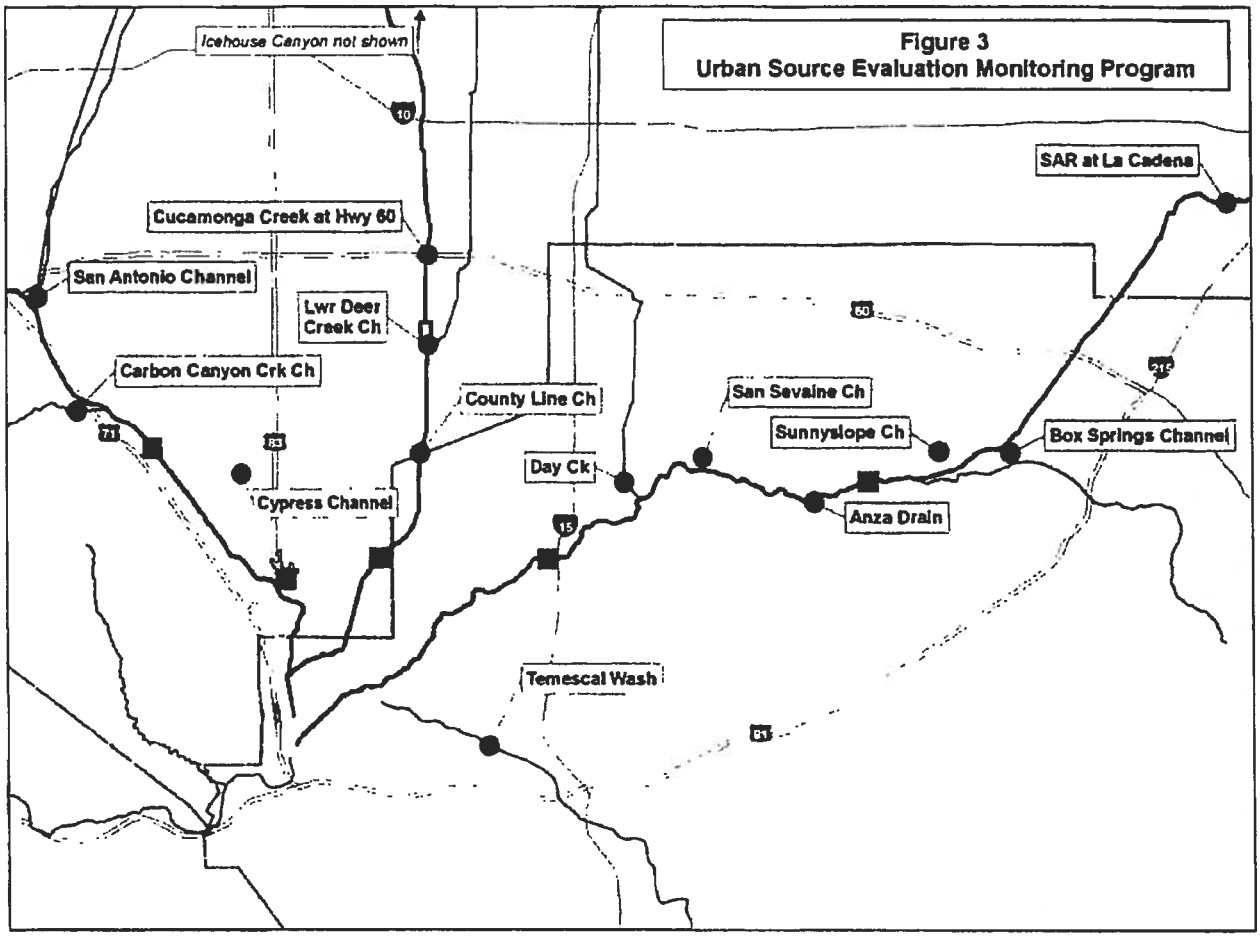
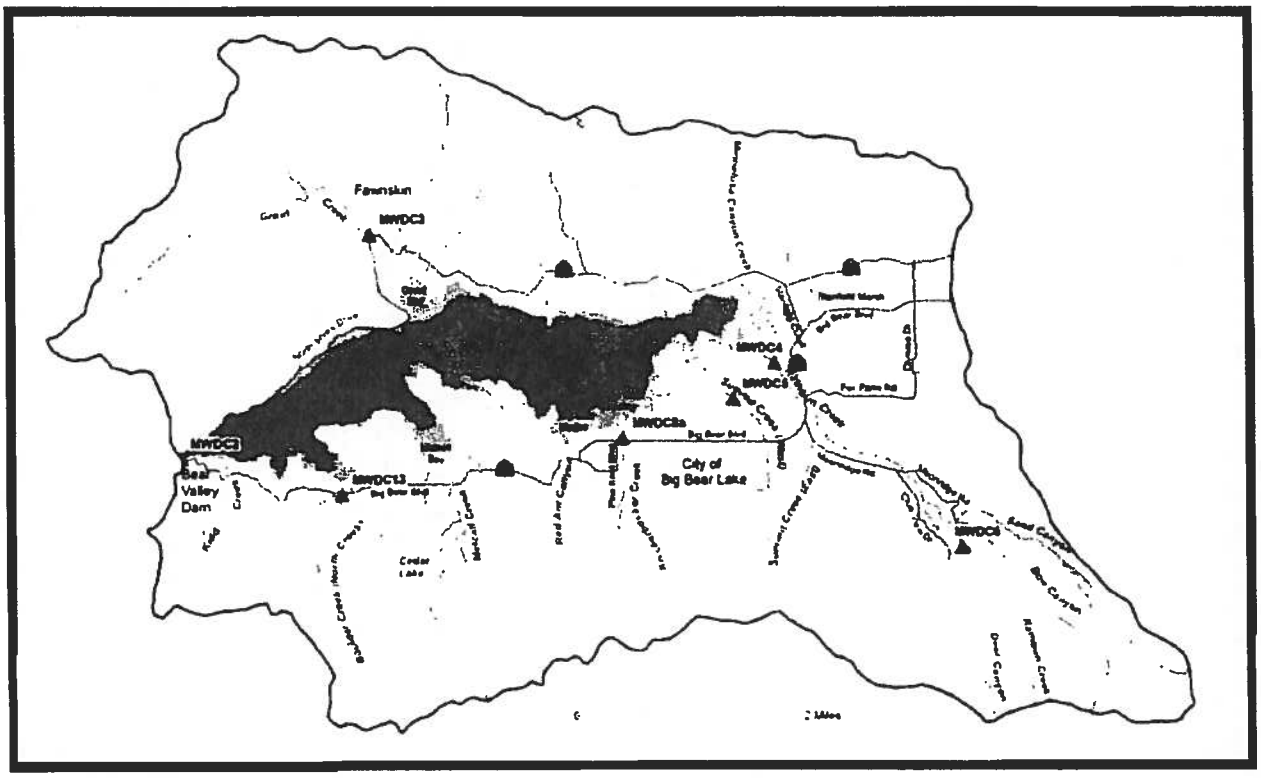


Figure 4: Big Bear Lake Nutrient TMDL Watershed-Wide Monitoring Locations



State of California

California Regional Water Quality Control Board

Santa Ana Region

3737 Main Street, Suite 500

Riverside, CA 92501- 3348

FACT SHEET

January 29, 2010

ITEM: **10**

SUBJECT: **Waste Discharge Requirements for the San Bernardino County Flood Control District (SBCFCD), the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Area-wide Urban Storm Water Runoff Management Program, San Bernardino County, Order No. R8-2010-0036 (NPDES No. CAS618036)**

I. INTRODUCTION

The 1972 Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) permit program to regulate the discharge of pollutants from point sources to waters of the United States (U.S.). Since then, considerable strides have been made in reducing conventional forms of pollution, such as from sewage treatment plants and industrial facilities, through the implementation of the NPDES program and other federal, state and local programs. The adverse effects from some of the persistent toxic pollutants (DDT[1], PCB[2], TBT[3]) were addressed through manufacturing and use restrictions and through cleanup of contaminated sites. On the other hand, pollution from land runoff (including pollutants from atmospheric deposition, urban, suburban and agricultural sources) was largely unregulated until the 1987 CWA amendments. As a result, diffuse sources, including urban storm water runoff, now contribute a larger portion of many kinds of pollutants than the more thoroughly regulated sewage treatment plants and industrial facilities. The 1987 CWA amendments established a framework for regulating urban storm water runoff. Pursuant to these amendments, the Santa Ana Regional Water Quality Control Board (Regional Board) started regulating municipal storm water runoff in 1990.

It is also critical to manage non-point sources, such as runoff from agricultural sources, in order to effectively prevent or remedy water quality impairment. In 2000, the State Water Resources Control Board and the California Coastal Commission developed a

[1] DDT: Dichlorodiphenyltrichloroethane
[2] PCB: Polychlorinated biphenyl
[3] TBT: Tributyltin

Non-Point Source Pollution Control Program. This program was approved by the USEPA and NOAA[4] and is being implemented by a number of agencies.

The attached pages contain information concerning an application for renewal of waste discharge requirements and an NPDES permit. Order No. R8-2010-0036, NPDES No. CAS618036, prescribes waste discharge requirements for urban storm water runoff[5] from the cities and the unincorporated areas in San Bernardino County within the jurisdiction of the Regional Board. As defined by 40 CFR 122.26(b)(13), storm water includes storm water runoff, snowmelt runoff, surface runoff and drainage. "Storm water" is defined as urban runoff and snowmelt runoff consisting only of those discharges which originate from precipitation events. Storm water is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.

Urban runoff is defined as all flows in a storm water conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water (authorized under Section V of the Order, dry weather flows).

On October 26, 2006, the San Bernardino County Flood Control District (SBCFCD, the Principal Permittee) and the County of San Bernardino, in cooperation with the cities of Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa (Co-Permittees, hereinafter collectively referred to as Permittees or Dischargers), submitted a Report of Waste Discharge (ROWD)) for renewal of their area-wide NPDES storm water permit. The permit renewal application was submitted in accordance with the requirements specified in the previous NPDES storm water permit (Order No. R8-2002-0012). The permit application also follows guidance provided by Regional Board and State Water Resources Control Board (State Board) staff, and the United States Environmental Protection Agency (USEPA). Order No. R8-2002-0012 expired on April 27, 2007 and was administratively extended in accordance with 40 CFR Part 122.6 and Title 23, Division 3, Chapter 9, §2235.4 of the California Code of Regulations.

Order No. R8-2010-0036 regulates discharges of stormwater and urban runoff[6] from the upper Santa Ana watershed to waters of the U.S.

II. REGULATORY BACKGROUND/CLEAN WATER ACT REQUIREMENTS

As storm water flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas, it can mobilize pollutants from these areas and transport them to waters of the U.S. If appropriate pollution control measures are not implemented, urban runoff may contain elevated levels of pathogens (bacteria, viruses, protozoa), sediment, trash, fertilizers (nutrients, mostly nitrogen and phosphorus compounds), oxygen-demanding substances (decaying and/or decomposable matter), pesticides (e.g., DDT, chlordane, diazinon, chlorpyrifos, etc.)

[4] NOAA:National Oceanic and Atmospheric Administration

[5] Urban Storm Water Runoff includes authorized non-storm water as per Section V of the Order and storm water runoff, collectively referred to as urban runoff (also see glossary).

[6] For purposes of this Order, urban runoff includes storm water and authorized non-storm water discharges as per Section V of the Order.

heavy metals (cadmium, copper, chromium, lead, zinc, etc.), and petroleum products (oil & grease, PAHs[7], petroleum hydrocarbons, etc.). If not properly managed and controlled, urbanization can change the stream hydrology and increase pollutant loading to receiving waters. In general, as a watershed undergoes urbanization, pervious surface area decreases, runoff volume and velocities increase, riparian habitats and wetland habitats decrease, the frequency and severity of flooding may increase, and pollutant loading increases. Most of these impacts are due to human activities that occur during and/or after urbanization. The pollutants and hydrologic changes can cause declines in aquatic resources, cause toxicity to marine organisms, and impact human health and the environment.

If not properly controlled, urban runoff could be a significant source of pollutants in waters of the U.S. Table 1 includes a list of pollutants and their sources, and some of the adverse environmental consequences resulting from urbanization.

The Permittees in San Bernardino County conducted urban runoff monitoring and determined that for a number of constituents (e.g., bacteria, copper, lead, nutrients), urban runoff quality exceeded the Basin Plan objectives, CTR criteria, and/or USEPA's storm water benchmarks. The permit renewal application submitted by the Permittees (2006 ROWD) ranked bacterial contamination as the highest priority urban runoff problem[8] within the permitted area.

(Left intentionally blank)

[7] PAHs (Polycyclic aromatic hydrocarbons) – a hydrocarbon containing two or more aromatic rings. PAHs are persistent, bioaccumulative, and toxic pollutant. PAHs occur in oil, coal, and tar deposits, and are produced as byproducts of fuel burning. Sources include industrial processes, transportation, energy production and disposal activities.

[8] 2006 Report of Waste Discharge (ROWD)

Table 1[9]. Pollutants/Impacts of Urbanization on Waters of the U.S.

Pollutants	Sources	Effects and Trends
Toxins (e.g., biocides, PCBs, trace metals, heavy metals)	Industrial and municipal wastewaters; runoff from farms, forests, urban areas, and landfills; erosion of contaminated soils and sediments; vessels; atmospheric deposition	Poison and cause disease and reproductive failure; fat-soluble toxins may bioconcentrate, particularly in birds and mammals, and pose human health risks. Inputs into U.S. waters have declined, but remaining inputs and contaminated sediments in urban and industrial areas pose threats to living resources.
Pesticides (DDT, diazinon, chlorpyrifos)	Urban runoff; residential, commercial, industrial, and farm use; agricultural runoff	Legacy pesticides (DDT, chlordane, dieldrin) have been banned; still persists in the environment; some of the other pesticide uses have been curtailed or restricted.
Biostimulants (organic wastes, plant nutrients)	Sewage and industrial wastes; runoff from farms and urban areas; nitrogen from combustion of fossil fuels	Organic wastes overload bottom habitats and deplete oxygen; nutrient inputs stimulate algal blooms (some harmful), which reduce water clarity, cause loss of seagrass and coral reef, and alter food chains supporting fisheries. While organic waste loadings have decreased, nutrient loadings have increased (NRC, 1993a, 2000a).
Petroleum products (oil, grease, petroleum hydrocarbons, PAHs)	Runoff and atmospheric deposition from land activities; shipping and tanker operations; accidental spills; oil gas production activities; natural seepage; PAHs from internal combustion engines	Petroleum hydrocarbons can affect bottom organisms and larvae; spills affect birds, mammals and aquatic life.
Radioactive isotopes	Atmospheric fallout, industrial and military activities	Bioaccumulation may pose human health risks where contamination is heavy.
Sediments	Erosion from farming, construction activities, forestry, mining, development; river diversions; dredging and mining	Reduce water clarity and change bottom habitats; carry toxins and nutrients; clog fish gills and interfere with respiration in aquatic fauna. Sediment delivery by many rivers has decreased, but sedimentation poses problems in some areas.

[9] Adapted from Boesch, D.F., R.H. Burroughs, J.E. Baker, R.P. Mason, C.L. Rowe, and R.L. Siefert. 2001. Marine Pollution in the United States: Significant Accomplishments, Future Challenges. Pew Oceans Commission, Arlington, Virginia.

Pollutants	Sources	Effects and Trends
Plastics and other debris	Boats, ships, fishing nets, containers, trash, urban runoff	Entangles aquatic life or is ingested; degrades beaches, wetlands and nearshore habitats. Floatables (from trash) are an aesthetic nuisance and can be a substrate for algae and insect vectors.
Pathogens (bacteria, protozoa, viruses)	Sewage, urban runoff, livestock, wildlife, and discharges from boats and cruise ships.	Pose health risks to swimmers and consumers of seafood.
Alien species	Ships and ballast water, fishery stocking, aquarists	Displace native species, introduce new diseases; growing worldwide problem (NRC 1996).

The (CWA) prohibits the discharge of any pollutant to navigable waters from a point source unless an NPDES permit authorizes the discharge. The 1987 amendments to the CWA required municipal separate storm sewer systems (MS4s) and industrial facilities, including construction sites, to obtain NPDES permits for storm water runoff from their facilities. On November 16, 1990, the USEPA promulgated the final Phase I storm water regulations. The storm water regulations are contained in 40 CFR Parts 122, 123 and 124.

This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal Clean Water Act section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc. v. U.S. E.P.A.* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (*cf. Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

Likewise, the provisions of this Order to implement total maximum daily loads (TMDLs) are federal mandates. The federal Clean Water Act requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. § 1313(d).) Once the U.S. Environmental Protection Agency or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. § 122.44(d)(1)(vii)(B).)Second, the local agency permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Except for municipal separate storm sewer systems, the Clean Water Act requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Resources Control Board decisions, this Order does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Order, therefore, regulates the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.
Third, the local agency permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles* (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their discharges. To the extent, the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord *County*

of San Diego v. State of California (1997) 15 Cal.4th 68, 107-108.) Likewise, the Permittees have voluntarily sought a program-based municipal storm water permit in lieu of a numeric limits approach. (See *City of Abilene v. U.S. E.P.A.* (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limits].) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See *Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

The areawide NPDES permit for San Bernardino County areas within the Santa Ana Regional Board's jurisdiction is being considered for renewal in accordance with Section 402(p) of the CWA and all requirements applicable to an NPDES permit issued under the issuing authority's discretionary authority. The requirements included in this Order are consistent with the CWA, the federal regulations governing urban storm water discharges, the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), the CWC, and the State Board's Plans and Policies.

The Basin Plan is the basis for the Regional Board's regulatory programs. The Basin Plan incorporates plans and policies adopted by the State Board by reference. The Basin Plan was developed and is periodically reviewed and updated in accordance with relevant federal and state laws and regulations, including the CWA and the CWC. As required, the Basin Plan designates the beneficial uses of the waters of the Region and specifies water quality objectives intended to protect those uses. (Beneficial uses and water quality objectives, together with an antidegradation policy, comprise federal "water quality standards"). The Basin Plan also specifies an implementation plan, which includes certain discharge prohibitions. In general, the Basin Plan makes no distinctions between wet and dry weather conditions in designating beneficial uses and setting water quality objectives, i.e., the beneficial uses, and correspondingly, the water quality objectives are assumed to apply year-round. (Note: In some cases, beneficial uses for certain surface waters are designated as "I", or intermittent, in recognition of the fact that surface flows (and beneficial uses) may be present only during wet weather.) Most beneficial uses and water quality objectives were established in the 1971, 1975, 1983, and 1995 Basin Plans. The 1995 Basin Plan was updated in February 2008[10]. Amendments to the Basin Plan included new nitrate-nitrogen and total dissolved solids (TDS) objectives for specified management zones and new nitrogen and TDS management strategies applicable to both surface and ground waters and various Total Maximum Daily Loads (TMDLs) and Implementation Plans that had been adopted for several impaired water bodies within the region.

Water Code Section 13241 requires that certain factors must be considered-when water quality objectives are established. These factors include economics and the

[10] http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml

need for developing housing in the Region. (The latter factor was added to the CWC in 1987).

During the third-term permit (R8-2002-0012) development process, the Permittees raised an issue regarding compliance with Section 13241 of the California Water Code with respect to water quality objectives for wet weather conditions, specifically the cost of achieving compliance during wet weather conditions and the need for developing housing within the Region and its impact on urban storm water runoff. In response to this request, Regional Board staff in collaboration with the permittees in the region has organized a Storm Water Quality Standards Task Force (SWQSTF). The SWQSTF is closely monitoring actual and potential beneficial uses of surface waters within the region. Based on the findings, it is likely that the SWQSTF will recommend changes to the current beneficial use designations and water quality objectives specified in the Basin Plan. This Order may be reopened to incorporate any changes to the water quality standards. In the meantime, the provisions of this Order will result in reasonable further progress towards the attainment of the existing water quality objectives, in accordance with the discretion in the permitting authority recognized by the United States Court of Appeals for the Ninth Circuit in Defenders of Wildlife v Browner, 191 F.3d 1159, 1164 (9th Cir. 1999).

III. BENEFICIAL USES

Storm water flows that are discharged to MS4s within the Santa Ana River Watershed in San Bernardino County are tributary to various water bodies (inland surface streams, lakes and reservoirs) of the state (see Attachment 2 for a list of surface waterbodies within the Permitted area). The beneficial uses of these water bodies include municipal and domestic supply, agricultural supply, industrial service and process supply, groundwater recharge, hydropower generation, water contact recreation, non-contact water recreation, commercial and sportfishing, warm freshwater habitat, cold freshwater habitat, preservation of biological habitats of special significance, wildlife habitat and preservation of rare, threatened or endangered species, spawning, reproduction and development of aquatic habitats and estuarine habitat. The ultimate goal of this Permit and the related urban storm water management program is to protect the beneficial uses of the receiving waters.

IV. PERMITTED AREA

The permitted area is delineated by the Santa Ana-Lahontan Regional Board boundary line on the north and northeast, the Santa Ana-Colorado River Basin Regional Board boundary on the east, the San Bernardino-Riverside County boundary on the south and southeast, the San Bernardino-Orange County boundary on the southwest, and the San Bernardino-Los Angeles County boundary on the west (see Attachment 1). The permittees serve a population of approximately 1.5 million, occupying an area of approximately 620 square miles[11]. For the entire county, the population estimated as of July 1, 2008 is 2.06 million[12]. The latest figures from the San Bernardino County Storm

[11] 2006 Report of waste Discharge.

[12] State of California, Department of Finance, Population Estimates and Components of Change by County, July 1, 2000-2008. Sacramento, California, December 2008

Water Program 2007-2008 Annual Report estimated 378 miles of aboveground channels and 485 miles of underground storm drain channels, for a total of 863 miles in the project area. Approximately seven percent (7%) of the San Bernardino County surface area drains into water bodies within this Regional Board's jurisdiction. Storm water discharges from urbanized areas consist mainly of surface runoff from residential, commercial and industrial developments. In addition, there are storm water discharges from agricultural land uses, including farming and animal feeding operations. However, the CWA specifically excludes discharges composed entirely of return flows from irrigated agriculture and nonpoint source agricultural activities. The concentrated animal feeding operations within the Region are regulated under the Regional Board's General Permit for Dairies, Order No. R8-2007-0001, NPDES No. CAG018001. Areas of the County not addressed or which are excluded under the storm water regulations and areas not under the jurisdiction of the Permittees are excluded from coverage under this permit. These excluded areas and activities include the following:

- Federal lands and state properties, including, but not limited to, military bases, national forests, hospitals, schools, colleges and universities, and highways;
- Native American tribal lands;
- Agricultural lands; and
- Utilities and special districts.

The Regional Board will coordinate with these entities to implement programs that are consistent with the requirements of this Order. The Regional Board, pursuant to 40 CFR 122.26(a), has the discretion and authority to require non-cooperating entities to participate in this Order. The Regional Board may also consider such facilities for coverage under its NPDES permitting scheme pursuant to USEPA Phase II storm water regulations.

To the extent that the Permittees authorize the connection of these discharges into their MS4s, this Order requires the Permittees to provide written notification of WQMP requirements for post-construction BMPs and/or other applicable requirements of this Order. A WQMP approved by the Permittee who owns the MS4 may constitute compliance with the General Construction Permit post-construction requirements[13] for the Permit Area.

V. WATERSHED MANAGEMENT/UPPER SANTA ANA RIVER BASIN

To regulate and control storm water discharges from the San Bernardino County area to the San Bernardino County MS4s, an area-wide approach is expected to be the most effective. The entire storm drain system in San Bernardino County is not controlled by a single entity; San Bernardino County, the SBCFCD, several cities, State Department of Transportation (Caltrans), US Army Corps of Engineers and a number of other entities own, operate, and/or manage the storm drain systems. In addition to the Cities, the

[13]The State General Construction Permit Order No. 2009-009-DWQ Section XIII.

County and the SBCFCD, there are a number of significant contributors of urban storm water runoff to these storm drain systems. These include: large institutions, such as State University facilities, schools, hospitals, etc.; federal facilities, such as Department of Defense facilities; State agencies, such as Caltrans; water and wastewater management agencies, such as San Bernardino Valley Municipal Water District and Inland Empire Utilities Agency; the National Forest Service; state parks, and entertainment centers such as Pharaoh's Lost Kingdom Park in Redlands, Fiesta Village Family Fun Park in Colton, and other motorsports facilities scattered throughout the County. The management and control of the entire flood control system cannot be effectively carried out without the cooperation and efforts of all these entities. Also, it would not be effective to issue a separate storm water permit to each of the entities within the permitted area whose land/facilities drain into the county storm drain systems and ultimately to waters of the U. S. The Regional Board has concluded that the best management option for the San Bernardino County area is to issue an area-wide storm water permit. Some of the MS4s in the project area discharge into MS4s controlled by other entities, such as the County of Riverside, the County of Orange, and the County of Los Angeles.

Cooperation and coordination among all the stakeholders are essential for efficient and economical management of the watershed. Regional Board staff will facilitate coordination of monitoring and management programs among the various stakeholders, where necessary.

An integrated watershed management approach for urban runoff is consistent with the Strategic Plan (2008-2012[14]) for the State and Regional Boards and the draft California Water Plan Update[15]. A watershed wide approach is also necessary for implementation of the load and waste load allocations to be developed under the TMDL process. The MS4 permittees and all the affected entities are required to participate in regional or watershed solutions, where appropriate, instead of project-specific and fragmented solutions.

The pollutants in urban runoff originate from multiple sources, and effective control of these pollutants requires a cooperative effort of all the stakeholders and many regulatory agencies. Every stage of urbanization should be considered in developing appropriate urban runoff pollution control methodologies. The program's success depends upon consideration of pollution control techniques during planning, construction and post-construction operations. At each stage, appropriate pollution prevention measures, proper site design considerations, source control measures, and, if necessary, treatment techniques should be considered. In the 2006 ROWD, the Permittees proposed a watershed approach based on a prioritized risk to beneficial uses.

1. SUB-WATERSHEDS AND MAJOR CHALLENGES

The Santa Ana River Watershed in San Bernardino County can be subdivided into the following sub-watersheds:

[14] State Water Resources Control Board, Strategic Plan Update, 2008-2012, September 2, 2008
[15] http://www.waterplan.water.ca.gov/docs/cwpu2009/1208prd/vol2/UrbanRunoff_PRD_09.pdf

A. *UPPER SANTA ANA RIVER WATERSHED*

The Upper Santa Ana River Watershed includes the upper reaches of the Santa Ana River (Reaches 4, 5 and 6) and its tributaries.

1. Reach 4 of the Santa Ana River: Reach 4 of the Santa Ana River is the portion of the River from Mission Boulevard bridge in Riverside to the San Jacinto fault (Bunker Hill Dike) in San Bernardino. There is perennial flow in this reach of the River, mostly from the upstream discharges of treated municipal wastewater. Much of this reach is also maintained as a flood control facility. This reach of the River is posted to warn against water contact recreation, due to microbial problems. The wastewater discharges from the sewage treatment plants to this reach of the River are tertiary treated and are not expected to be sources of microbial contamination. This reach is identified as an impaired waterbody for pathogens in the 303(d) list, scheduled for TMDL completion in 2019. Lytle Creek and Cajon Creek are tributaries to this reach of the River.

   Other water quality problems along this reach of the River include the buildup of total dissolved solids (TDS, dissolved salts or minerals) and nitrogen, largely in nitrate form. The buildup of TDS and nitrates can impact downstream beneficial uses, including groundwater recharge. The buildup of TDS and nitrate is mostly due to agricultural uses, including dairies and the application of fertilizers, municipal and industrial wastewater discharges, and reuse and recycling operations. A complex set of programs and policies are included in the Basin Plan to address this problem, including a water supply plan, a wastewater management plan, and a groundwater management plan. Other elements of the Basin Plan include the non-point source program and the storm water program. The Basin Plan identifies the Statewide General Permits and the MS4 permits as the regulatory tools for storm water management in the Basin. In light of the recently adopted Nitrogen-TDS objectives for certain management zones, this Order requires the Permittees to determine baseline concentration of these constituents in dry weather runoff, if any, from significant outfall locations. The Order also includes effluent limitations for TDS and nitrates under dry weather conditions.

2. Reach 5 of the Santa Ana River: This reach of the River extends from the San Jacinto Fault in San Bernardino to the Seven Oaks Dam. Most of this reach of the River is maintained as a flood control facility and is dry, except during storm flows and operational releases from the dam. Major tributaries to this reach include San Timoteo Creek, City Creek, Plunge Creek, and Warm Creek. These tributaries are also usually dry, except for the discharge of treated wastewater from Yucaipa Valley Water District to San Timoteo Creek and from the City of Beaumont to Coopers Creek (a tributary to San Timoteo Creek). These wastewater discharges flow for a short distance and percolate into the ground. No major water quality problems have been identified in this stretch of the River or its tributaries.

3. Reach 6 of the Santa Ana River: This reach includes the River upstream of Seven Oaks Dam. Major tributaries include Bear Creek, Forsee Creek, and Rattlesnake Creek. Flows consist mostly of snowmelt and storm water runoff. There are no documented water quality problems in this reach of the river and no listed impairments.

B. *CHINO BASIN WATERSHED*

The Chino Basin Watershed covers about 405 square miles and lies largely in the southwestern corner of San Bernardino County, and part of western Riverside County. This permit only covers those portions of the watershed that are within San Bernardino County and under the jurisdiction of this Board. Surface drainage is generally southward, from the San Gabriel Mountains toward the Santa Ana River and Prado Flood Control Basin. Major surface waterbodies in the Chino Basin Watershed include:

- San Antonio Creek
- Chino Creek
- Cucamonga Creek
- Day Creek, and
- Deer Creek

Although it was originally developed as an irrigated agricultural area, and then as dairies, the watershed is more recently being steadily urbanized. The municipalities under this permit in the Chino Basin Watershed include Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto, and Upland. The Chino-Corona Agricultural Preserve had the highest concentration of dairy animals in the nation until very recently manure and wastewater from dairy operations contain elevated levels of nutrients, salts, and bacteria. The ground and surface water quality in the area have been adversely impacted by bacteria (surface water), nutrients and salts.

The dairies within the Region are regulated under the General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) within the Santa Ana Region (Board's General Dairy Permit), Order No. R8-2007-001, NPDES No. CAG018001. The General Dairy Permit allows discharge of storm water from dairies only for storms exceeding a 24-hour 25-year frequency. Portions of the area lack flood control facilities, and storm runoff from these areas is predominantly carried by flows on and parallel to roadways The San Bernardino and Riverside County Flood Control Districts, in cooperation with local municipalities, have coordinated to construct flood control facilities in the area.

On April 19, 2004, construction began on the project known as County Line Channel (also known as Eastvale San Bernardino Line 2-13) sponsored by San Bernardino County Flood Control District, Riverside County Flood Control

and Water Conservation District, and the City of Ontario. The three-mile-long concrete-lined drainage channel along the Riverside/San Bernardino county line will intercept runoff. Overland surface storm flows from the City of Ontario and County of San Bernardino portions of the watershed is typically collected by roadways and the flows are discharged into the Cucamonga Creek Channel. The project design enables storm water to be captured and channeled into an existing facility with the capacity to contain the 100-year flow and will accommodate major storm drain laterals in the future to prevent commingling of urban runoff with agricultural drainage. In addition to these benefits, the project prevents the degradation of recharged groundwater upstream of the Chino-Corona Preserve. This project has been completed.

To comply with the recently established nitrogen/TDS objectives, groundwater problems (mostly TDS and nitrate) in the Chino Basin Watershed are being addressed through a comprehensive watershed management plan. As part of this plan, desalters are being built to increase the salt removal from the groundwater through a pump and treat system for contaminated groundwater in the southern part of Chino Basin. One desalter (Chino I Desalter) has been operational since August 2000, and a second one, known as the Chino I Expansion/Chino II Desalter Project, was completed in the spring of 2006.

(Also see discussions below regarding TMDLs for the Middle Santa Ana River watershed.)

C. *BIG BEAR LAKE WATERSHED*

The Big Bear Lake watershed is located in the San Bernardino Mountains. Major waterbodies in this watershed include:

- Big Bear Lake
- Baldwin Lake (currently a dry lakebed)
- Stanfield Marsh
- Shay Meadows
- Rathbone (Rathbun) Creek
- Summit Creek
- Grout Creek
- Knickerbocker Creek

Big Bear Lake is a high mountain reservoir occupying a relatively small, east-to-west oriented basin. The basin supports a large number of recreational activities. Lake recreational activities include fishing, swimming, boating and water skiing. Areas adjacent to the lake are used for camping, skiing, hiking, equestrian trails and other outdoor activities. Water in the lake is also used for municipal supplies. A number of water quality problems have been identified for the lake.

The 2006 303(d) list of impaired water bodies (see below) designated the following waterbodies in this sub-watershed as impaired: Big Bear Lake (nutrients, copper and mercury); Grout Creek (metals and nutrients); Knickerbocker Creek (metals and pathogens); Summit Creek (nutrients); and Rathbone Creek (nutrients and siltation). The problem pollutants have been identified by the Regional Board as coming from resource extraction activities, urban runoff, snow skiing facilities, construction and land developments, and non-point sources. In conjunction with local stakeholders, the Big Bear Lake Nutrient TMDL for Dry Hydrologic Conditions has been developed and is being implemented. For other pollutants, work is underway to develop TMDLs.

2. CWA SECTION 303(d) LIST AND TMDLS:

The 2006 water quality assessment conducted by the Regional Board[16] identified a number of waterbodies within the Region as impaired waterbodies, under Section 303(d) of the CWA[17]. These are waterbodies where the designated beneficial uses are not met and the water quality objectives are being exceeded. These waterbodies were placed on the CWA Section 303(d) list of impaired waters. The impaired waterbodies in San Bernardino County within the Santa Ana Regional Board's jurisdiction are listed in Table 2.

Federal regulations require that a total maximum daily load (TMDL) be established for each 303(d) listed waterbody for each of the pollutants causing impairment. The TMDL is the total amount of the problem pollutant that can be discharged while water quality standards in the receiving water are attained, i.e., water quality objectives are met and the beneficial uses are protected. It is the sum of the individual wasteload allocations (WLA) for point sources, load allocations (LA) for non-point sources and natural background sources, with a margin of safety. The TMDLs are the basis for limitations established in waste discharge requirements.

This Order incorporates TMDLs that have been adopted for bacterial indicators in the Middle Santa Ana River Watershed and nutrients (phosphorus) for dry hydrological conditions in Big Bear Lake. On August 26, 2005, the Regional Board adopted Resolution No. R8-2005-001 amending the Basin Plan to incorporate Bacterial Indicator TMDLs for Middle Santa Ana River Watershed Waterbodies. On April 21, 2006, the Regional Board adopted Resolution No. R8-2006-0023 amending the Basin Plan to incorporate a Nutrient TMDL for Dry Hydrological Conditions for Big Bear Lake. A Mercury TMDL for Big Bear Lake is currently under development, and TMDLs are scheduled for development for all pollutants identified in Table 2. The stakeholders in this watershed are collaborating in the development and implementation of the TMDLs.

[16] On April 24, 2009, the Regional Board adopted an Integrated List of Impaired Waters Under Clean Water Act Sections 305(b) and 303(d), Resolution No. R8-2009-0032.

[17] 2006 CWA Section 303(d) list of water quality limited segments (http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r8_06_303d_reqtmdls.pdf)

Federal regulations (40 CFR 122.44(d)(vii)(B)) require that the NPDES permits be consistent with the applicable wasteload allocations in the TMDLs. This Order requires the Permittees to implement BMPs designed to reduce pollutants to achieve applicable wasteload allocations by the compliance dates in the approved TMDLs.

For 303(d) listed waterbodies without a TMDL, the Permittees currently require certain categories of new and significant re-development projects that drain into these impaired waterbodies to treat post-construction runoff with BMPs of medium to high treatment effectiveness. This Order further requires the Permittees to develop BMPs and/or strategies as part of a Watershed Action Plan and continue their participation in the TMDL development.

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Table 2

CLEAN WATER ACT SECTION 303(D) LISTED WATERBODIES & TMDL SCHEDULE[18]

Waterbody	Hydro Unit	Size Affected	Pollutant Stressor	Source	Priority	TMDL Schedule	Permittees
Big Bear Lake	801.710	2970 acres 2970 acres 2970 acres 2970 acres 2970 acres 2970 acres 2970 acres 2970 acres	Copper Mercury[19] Metals Noxious aquatic plants Nutrients Sedimentation/Siltation[20] PCBs (Polychlorinated biphenyls)	Resource Extraction Resource Extraction[21] Resource Extraction Construction/Land development Construction/Land development Snow Skiing Activities Construction/Land development Snow Skiing Activities Unknown	Medium Medium Medium Medium Medium Medium Medium Medium	2007 2007 2007 2006 2006 2006 2019	City of Big Bear Lake County of San Bernardino
Summit Creek	801.710	1 mile	Nutrients	Construction/Land Development	Medium	2008	City of Big Bear Lake, County of San Bernardino
Knickerbocker Creek	801.710	2 miles 2 miles	Metal Pathogens	Unknown Non-point Source Unknown Non-point Source	Medium	01/03 – 01/05 Sole Source	City of Big Bear Lake, County of San Bernardino
Grout Creek	801.720	2 miles 2 miles	Metal Nutrients	Unknown Non-point Source Unknown Non-point Source	Medium	01/02 – 0105 2008	City of Big Bear Lake, County of San Bernardino
Rathbone Creek	801.720	2 miles 2 miles	Nutrients Sedimentation/Siltation	Unknown Non-point Source Snow Skiing Activities	Medium	2008 2006	City of Big Bear Lake, County of San Bernardino
Mountain Home Creek, East Fork	801.700	1 mile	Pathogens	Unknown Non-point Source	Low	2019	County of San Bernardino
Mountain Home Creek	801.580	4 miles	Pathogens	Unknown Non-point Source	Low	2019	County of San Bernardino
Mill Creek (Prado Area)	801.250	4 miles	Nutrients Suspended Solids	Agriculture, Dairies Dairies	Medium Medium	2019 01/00 – 01/05	Ontario, Rancho Cucamonga, Upland, SBCFCD, County of San Bernardino
Mill Creek, Reach 1	801.580	5 miles	Pathogens	Unknown Non-point Source	Low	2019	Redlands, SBCFCD, County of San Bernardino
Mill Creek, Reach 2	801.580.	8 miles	Pathogens	Unknown Non-point Source	Low	2019	SBCFCD, County of San Bernardino
Santa Ana River, Reach 4	801.270	12 miles	Pathogens	Non-point Source	Low	2019	Colton, Rialto, Highland, Grand Terrace, Redlands, City of San Bernardino, SBCFCD, County of San Bernardino
Lytle Creek	801.400	18 miles	Pathogens	Unknown Non-point Source	Low	01/08 – 01/11	City of San Bernardino, SBCFCD, County of San Bernardino
Chino Creek, Reach 1	801.210	2 miles	Nutrients	Agriculture Dairies	Medium	2019	Chino, Chino Hills, SBCFCD, County of San Bernardino
Prado Park Lake	801.210	60 acres	Nutrients	Non-point Source	Low	01/08 – 01/11	Chino, Chino Hills, County of San Bernardino

[18] Based on STATE BOARD 2006 CWA Section 303(d) List of Water Quality Limited Segments, Santa Ana Regional Water Quality Control Board, USEPA Approved June 28, 2007 (http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r8_06_303d_reqtmdls.pdf)

[19] Big Bear Lake is recommended for delisting for copper in the Proposed 2008 303(d)-305(b) Integrated Report

[20] Big Bear Lake is recommended for delisting for sedimentation/siltation in the Proposed 2008 303(d)-305(b) Integrated Report

[21] Resource extraction was removed as a potential source for Mercury in Big Bear Lake and replaced with atmospheric deposition in the Proposed 2008 303(d)-305(b) Integrated Report

VI. FIRST, SECOND AND THIRD-TERM PERMITS; URBAN STORM WATER RUNOFF POLLUTION CONTROL PROGRAMS/POLICIES

Prior to EPA's promulgation of the final storm water regulations, the counties of Orange, Riverside and San Bernardino requested areawide NPDES permits for storm water runoff. On August 29, 1990, the Regional Board issued Order No. 90-136 to the San Bernardino County permittees (first-term permit). In 1996, the Board adopted Order No. 96-32 (second-term permit). On October 25, 2002, the Board adopted Order No. R8-2002-0012 (third-term permit). These permits included the following requirements as outlined in the storm water regulations:

1. Prohibited non-storm water discharges to the MS4s, with certain exceptions.
2. Required the municipalities to develop and implement a Municipal Storm Water Management Plan (MSWMP) to reduce pollutants in urban storm water runoff to the maximum extent practicable (MEP).
3. Required the discharges from the MS4s to implement Best Management Practices (BMPs) to the MEP to meet water quality standards in receiving waters.
4. Required the municipalities to identify and eliminate illicit connections and illegal discharges to the MS4s.
5. Required the municipalities to establish and maintain legal authority to enforce storm water regulations.
6. Required monitoring of dry weather flows, storm flows, and receiving waters and conduct program assessments.
7. Required the permittees to inventory, prioritize and inspect construction sites and industrial and commercial facilities based on threat to water quality.
8. Required the permittees to develop a restaurant inspection program to address practices that may have an impact urban runoff quality such as: oil and grease disposal; trash bin area management; parking lot cleaning; spill clean-up; and maintenance of grease traps and interceptors.
9. Required the permittees to review and approve Water Quality Management Plans for categories of new development and significant redevelopment projects to address the impact of post-development runoff on water quality and hydromodification.
10. Required the permittees to develop a unified response plan to respond to any sewage spills that may have an impact on receiving water quality (Sanitary Sewer Overflow Unified Sewage Response Plan, July 1, 2003).

The following programs and policies have been implemented or are being implemented by the permittees. During the first-term permit, the permittees developed a Drainage Area Management Plan (1993 DAMP). The 1993 DAMP included a number of BMPs

and a very extensive public education program. The monitoring programs for the first and second-term permits included 10 monitoring stations within streams and flood control channels. The number of monitoring stations was later reduced to 5 stations to allow the Permittees to apply resources to a bacterial source monitoring program. The Executive Officer approved a delay in implementing the bioassessment requirement of the third-term permit to allow the development of indices of biological integrity that could be applied to inland waters. Subsequently, a regional bioassessment monitoring program was initiated by the Surface Water Ambient Monitoring Program (SWAMP) to determine the conditions of the receiving water in a more holistic manner. This Order requires the Permittees to participate in the regional bioassessment monitoring program. The findings and conclusions from these monitoring stations and monitoring programs (Riverside County, Orange County and others are participating in this regional effort) have been used to identify problem areas and to re-evaluate the monitoring program and the effectiveness of the BMPs. The future direction of some of these program elements will depend upon the results of the ongoing studies and a holistic approach to watershed management.

Other elements of the MSWMP included identification and elimination of illicit connections and illegal discharges and establishment of adequate legal authority to control pollutants in storm water discharges. The permittees have completed a survey of their storm drain systems to identify illegal/illicit connections and have adopted appropriate ordinances to establish legal authority. Some of the more specific achievements during the previous term permits are as follows:

1. Interagency Agreements and Coordination: The Permittees established a program management structure through an interagency Implementation Agreement and established a Management Committee with designated representatives from each of the Permittees to guide the program. The Permittees reviewed and revised the Implementation Agreement as part of the ROWD.

2. Ordinances, Plans and Policies: The Permittees completed a review of their storm drain ordinances and enforcement procedures for prohibiting discharges to the MS4s and for taking appropriate enforcement actions. The Area-Wide Enforcement Guidelines were subsequently prepared to support enforcement actions and to introduce consistency among the Co-Permittees' enforcement actions. In 2004, the Permittees replaced their Model Guidelines for New Development and Redevelopment with the Water Quality Management Plan Guidance and Template (WQMP), which was approved in 2004 and updated in 2005. The Permittees continue to provide training for appropriate public agency personnel on the Municipal Activities Pollution Prevention Strategy (MAPPS). The goal of this program is to ensure that public agency facilities and associated activities do not become a source of pollutants in storm water runoff. These "facilities" include the Permittees' vehicle and equipment fueling and fleet maintenance yards, corporate yards, hazardous materials storage facilities, material transfer and storage facilities, waste management and storage, fire stations, animal shelters, and municipal swimming pools. The MAPPS lists the

potential pollutants for these facilities and provides a list of BMPs for controlling these pollutants.

3. Municipal Inspections: The Permittees completed the development of the MS4 Solution Database. This database houses the inventory of construction, industrial, and commercial sites/facilities within each Permittee's jurisdiction. The inventory is regularly updated with new information.

   The Permittees developed and distributed BMP guidelines for the control of pollutants from mobile vehicle maintenance, carpet cleaning, commercial landscape maintenance, and pavement cutting activities.

4. HCOC Mapping: In early 2005, the Permittees initiated a a GIS-based mapping program to identify stream channels in the area that could be susceptible to excessive erosion and should be considered in assessing hydrologic conditions of concern (HCOC). Upon completion of this project, it will be integrated into the Watershed Action Plan.

5. Illegal Discharge/Illicit Connections: Litter, Debris and Trash Control: The Permittees completed a general characterization of the trash collected from the permitted area and are using this information to develop BMPs specifically targeting the major sources of trash in urban runoff.

6. Municipal Facilities/Activities: The San Bernardino County Flood Control District completed an assessment of their flood control facilities to evaluate opportunities to configure and/or to reconfigure channel segments to function as pollution control devices and to optimize beneficial uses.

   The Permittees developed and distributed BMP guidelines for the control of household use of fertilizers, pesticides, herbicides, and other chemicals, and pavement cutting activities.

   The Permittees worked with the County Fire Chiefs Association to develop a list of appropriate BMPs to be implemented to reduce pollutants from training activities, fire hydrant/sprinkler testing or flushing, non-emergency fire fighting, and any BMPs that could feasibly be implemented to address flows that occur during emergency firefighting activities.

7. Program Review: The annual reports and the Report of Waste Discharge included an effectiveness assessment of various program elements. Based on the monitoring results and the program effectiveness assessments, the 2006 ROWD recommended a shift to compliance-based outcomes measured primarily by compliance with water quality objectives and TMDL implementation. The ROWD also included an analysis of the impact of urban storm water runoff on the beneficial uses and recommended a risk-based approach to address problems associated with urban storm water runoff.

The requirements specified in this Order are consistent with the approach recommended in the ROWD including the TMDLs adopted by the Regional Board and approved by the State and the USEPA.

8. Public Education: In addition to developing and distributing fact sheets, brochures, and flyers with BMP information to control the discharge of pollutants in urban runoff, the Permittees have utilized a number of other avenues to convey this message to the public. These include: (1) public service announcements utilizing a multi-media approach, such as newspapers, radio, and television; (2) presentations at elementary schools and high school automotive classes; (3) educational displays at libraries and public buildings throughout the permitted area; (4) a point-of-purchase campaign with fact sheets containing information on integrated waste management, proper use of pesticides and fertilizers and integrated pest management programs; (5) a point-of-discharge campaign by warning the public about the dangers of waste disposals into the storm drains by stenciling all storm drain inlets; and (6) a web-site with links to other programs and services offered by the Permittees to combat storm water pollution including a 24-hour hotline to report spills, leaks and any illegal discharges to the MS4s. The Permittees have already met or exceeded the goal of a minimum of 5 million impressions per year by targeting all residents, businesses, commercial and industrial establishments within the Permitted area.

   The Permittees also completed a public awareness survey to determine the effectiveness of their existing public and business education strategy. The permittees participated in joint outreach programs with other entities including, but not limited to,, SAWPA[22], Caltrans, and other municipal storm water programs.

   The most effective programs and public education efforts should be continued to reinforce the importance of public participation and awareness to control pollutants in urban storm water runoff.

   The proposed Order includes additional requirements for an effective residential program as irrigation and nuisance flows from residential areas continue to be significant sources of nutrients, pesticides and other pollutants (from over fertilization or improper use of fertilizers, pesticides and other household chemicals).

9. Public Agency Training: During the second-term permit, the Permittees developed and conducted an 8-hour training program on the Municipal Activities Pollution Prevention Strategy (MAPPS). The MAPPS training program provided a basic storm water training and task-specific education for all targeted Permittee staff. These included key staff involved in sewage system maintenance, storm drain system inspection and maintenance, landscape maintenance, road and street maintenance, and key staff at maintenance and storage facilities.

[22] SAWPA: Santa Ana Watershed Project Authority

The MAPPs training was expanded in the third-term permit to include illegal discharge identification, response, and reporting; industrial/commercial inspection program, new and redevelopment program and public agency activities program. During the third-term permit, the Permittees refined their training program and developed web-based training modules to provide better access to the training program. The online training program is enhanced by various other training efforts, including live presentations and on the job training.

However, Regional Board staff conducted audits of the urban runoff program for each of the Permittees and determined that many of the Permittees' storm water program staff and contract staff were not adequately trained. The fourth-term permit requires the Permittees to develop appropriate curriculum for staff at various levels to make the storm water program more effective.

10. Watershed Activities: The Principal Permittee represented the Permittees in various watershed efforts dedicated to improving water quality, gathering technical information to support the MS4 program, TMDL activities, and regional and sub-regional monitoring programs. (See Section VII, below for a list of these programs.)

    The Permittees worked with other local and State agencies to provide a consistent urban storm water pollution control message to the public. These programs included:

    a. Public Health (Safe Drinking Water Program, Vector Control Program, Housing/Property Improvement Program, and Food Protection Program),

    b. Fire Department - Hazardous Materials Division, (Household Hazardous Waste Program, Emergency Response and Enforcement, Field Services, and Local Oversight Program),

    c. Economic Development / Public Services Group (Flood Control Function, Transportation Function, Waste Management Function, Regional Parks Function, Land Use Services and Code Enforcement Function), and

    d. San Bernardino County Special Districts (Operations Divisions consisting of Street Lighting Districts, Recreation and Parks Districts, Road Districts; Water and Sanitation Division consisting of nine water districts and seven sanitation districts).

    The Regional Board and the Permittees recognize the importance of watershed-based plans to address such complex issues related to the control of pollutants from various sources in urban storm water runoff. The fourth-term Permit includes requirements for the development and implementation of a Watershed Action Plan (see Section VIII, below).

11. Related Activities: The Permittees stabilized a number of flood control channels, constructed a sediment basin, expanded an existing basin, and identified, eliminated or properly documented illicit connections to the MS4s.

12. Water Quality Monitoring: The Permittees continue to monitor water quality at five sites for a variety of constituents. Three of the five sites were outfall locations selected to represent the quality of storm water from the drainage area; two sites serve as receiving water monitoring sites. The Permittees also participate in a number of TMDL-related or other regional or sub-regional monitoring programs. A number of programs related to the monitoring programs were completed during the third-term permit (see Section VII, below). These monitoring programs continue to indicate that urban storm water runoff contains elevated levels of pollutants (see Section VII, below).

    The fourth-term Permit includes additional monitoring requirements consistent with the federal regulations (40 CFR 122.48) and California Water Code Sections 13267 and 13383.

VII. WATER QUALITY ASSESSMENTS

An accurate and quantifiable measurement of the impact of the various elements of the storm water management programs is difficult, due to the temporal and spatial variations in storm water runoff quality, incremental nature of BMP implementation, the lack of comprehensive baseline monitoring data, and the existence of some of the programs and policies prior to initiation of formal storm water management programs. There are generally two accepted methodologies for assessing water quality improvements: (1) conventional monitoring such as chemical-specific water quality monitoring; and (2) programmatic assessments such as monitoring of the amount of household hazardous waste collected and disposed off at appropriate disposal sites, the amount of used oil collected, the amount of debris removed, etc.

Water quality monitoring data submitted to date document a number of exceedances of water quality objectives specified in the Basin Plan, CTR criteria and/or USEPA's storm water benchmarks for fecal coliform bacteria, total suspended solids (TSS), nutrients, COD and metals. Toxicity has also been observed at some of the monitoring locations. The 303(d) list of impaired waterbodies within the Region (see Table 2, above) also indicates that urban runoff is a significant source for these impairments. These findings indicate that urban storm water runoff continues to cause or contribute to water quality impairments.

A comparison of wet weather water quality monitoring data for 2000-2006[23] with that from 1994-1999[24] shows that the median concentrations for most constituents have not changed significantly. Furthermore, monitoring data for the period 1994-2006 indicate that median concentrations of wet weather composite samples at monitoring stations[25]

[23] 2006 ROWD
[24] 2002 ROWD
[25] Drainage at Site 2 (Cucamonga Creek @ Hwy 60) is predominantly urban, influenced by commercial and industrial land uses with some contribution from open space/rural and residential land uses. The predominant land use at Site 3 (Cucamonga Creek @ Hellman) is agricultural, but there is contribution from open space/rural, and discharge from a municipal wastewater treatment plant between Sites 2 and

2, 3, and 5 exceeded the USEPA benchmarks for TSS, COD, NO_3-N, and several metals. With the exception of Site 10 (Santa Ana River upstream of Seven Oaks Dam, tributary to mostly undeveloped areas), coliform bacteria concentrations were far above the Basin Plan water quality objectives. These data support the need for continued monitoring and additional control measures to control the discharge of pollutants from the MS4s.

To understand background indicator bacteria levels in the watershed necessary for the implementation of the MSAR TMDL, the Permittees conducted background indicator bacteria studies. Samples were collected quarterly from August 2000 to June 2006 during dry weather (<0.1 inch precipitation) at three sites (Cucamonga Canyon Site, Seven Oaks Dam Site, and Forest Falls Site) with no direct impact from urban runoff, sanitary sewer systems, or POTW discharge. The Seven Oaks Dam Site is located upstream of the dam and corresponds to stormwater monitoring Site 10. The Forest Falls Site is downstream of forested areas with few permanent campsites. Statistics from samples collected from December 2003 to June 2006, suggested that the Seven Oaks Dam Site (Site 10) had the highest concentrations of enterococcus and fecal streptococcus present, and that Cucamonga Creek Site and the Forest Falls Site have lower concentrations. Due to the predominance of non-detect data, similar determinations cannot be made for total coliform, *E. coli*, or fecal coliform concentrations. However, overall, samples taken at the Forest Falls Site exhibited the lowest concentrations of these types of indicator bacteria[26].

The Principal Permittee conducted an analysis of the receiving water monitoring data collected during the last 15 years for a number of monitoring sites (Sites 2, 3, 8[27], and 10[28]). This analysis indicates that the most significant water quality problem associated with urban storm water runoff is bacterial contamination. The Permittees' monitoring data were then compared to monitoring data available from other sources (NAWQA, RWQCB 305(b) Assessment) to determine beneficial use impacts and pollutants causing the impacts. This analysis was then used to prioritize problem areas and to propose a risk-based approach to address these problems.

Based on the evaluation of monitoring data described above, the 2006 ROWD prioritized the pollutants of concern with regards to storm water management as follow:

a. High Priority: Coliform bacteria
b. Medium Priority: Zinc, copper, lead
c. Low Priority: Nutrients, COD, TSS

During the prior permit terms, there was an increased focus on watershed management initiatives and coordination among the municipal permittees in Orange, Riverside and San

3. Monitoring site 5 (Hunts Lane n/o Hospitality Lane) is within a constructed storm drain system and flow is mostly from commercial and light industrial land uses with some urban contribution.

[26] 2005-2006 Annual Report.

[27] Site 8 station is located in the Santa Ana River (SAR) at Hamner Avenue, runoff is mostly from urban land uses.

[28] Site 10 station is located at SAR, upstream of Seven Oaks Dam, runoff is mostly from open/rural areas.

Bernardino Counties. These efforts resulted in a number of regional monitoring programs and other coordinated program and policy developments. The Principal Permittee continues to be an active participant in the Storm water Quality Standards Task Force (SWQSTF), the Big Bear TMDL and Middle Santa Ana River (MSAR) Bacterial Indicator TMDL, and the Storm Water Monitoring Coalition Studies. In addition to the TMDL implementation and monitoring activities, the Permittees participate in the Regional Integrated Freshwater Bioassessment Monitoring Program and the BMP Effectiveness Project to assess the effectiveness of LID techniques.

The Permittees, as participants in the SMC, have completed several monitoring-related activities, including Comparative Evaluation of Microbial Source Tracking Techniques, Model Monitoring Program Guidance, Peak Flow Study, and Laboratory Inter-Calibration.

It is anticipated that with continued implementation of the MSWMP, the ROWD and the requirements specified in this Order, the goals and objectives of the storm water regulations will be met, including protection of the beneficial uses of all receiving waters.

VIII. FUTURE DIRECTION/2006 ROWD & MSWMP

The NPDES permit renewal application (2006 ROWD) and the areawide Municipal Storm Water Management Program (MSWMP) describe the programs and policies the Permittees are proposing to implement during the fourth-term permit. The 2006 ROWD and MSWMP are the principal guidance documents for urban storm water management programs within San Bernardino County.

During the first three permit cycles, the Permittees focused on characterizing storm water quality and establishing a fundamentally sound program in each of the key areas identified in EPA regulations [40 CFR §122.34(b)]: (1) public education and outreach; (2) public involvement/participation; (3) illicit discharge detection and elimination; (4) construction site storm water runoff control; (5) post-construction storm water management in new development and redevelopment; and (6) pollution prevention/good housekeeping for municipal operations.

The sampling data collected over the years have been used to prioritize the most significant water quality problems in the receiving waters. As indicated in Section VII, above, the highest priority for the storm water program is the reduction of bacterial contamination.

For the fourth-term Permit, the Permittees have proposed to develop and implement a risk-based, outcome-oriented, compliance-focused program and will shift storm water management program from process-based outcomes which were mostly measured through completion of programmatic or administrative tasks. Under the fourth-term Permit, compliance will be determined based on attaining water quality standards and compliance with the wasteload allocations specified in the Total Maximum Daily Loads (TMDLs). Risk-based assessment and management aim to reallocate and reapportion program resources to target pollutants-of-concern that pose the greatest threat to human health or the environment. An outcome-oriented program places much greater

emphasis on demonstrating the effectiveness of various implementation activities. Direct measures (such as changes in water quality, tons of hazardous waste collected, etc.) will be preferred over indirect measures (such as advertising impressions, events attended, etc.). In particular, where TMDLs have been adopted for specific pollutants, the Permittees will shift available resources to be compliance-focused, to achieve compliance with water quality objectives. Program elements will be targeted toward executing the requirements identified in the TMDL implementation plans and pollution reduction goals specified in this Order. The primary goal of a compliance-focused program is to ensure storm water discharges consistently meet the water quality objectives identified in the Basin Plan. A comprehensive water quality monitoring program that is proposed in the fourth-term Permit will be used to evaluate the success of this new initiative.

This Order requires the Permittees to develop and implement comprehensive plans designed to achieve compliance with the wasteload allocations by the dates specified in the approved TMDLS. This Order requires that the results of the water quality monitoring provide the feedback loop to evaluate the effectiveness of the BMPs and programs implemented in the watershed and demonstrate Permittees' progress towards compliance with the wasteload allocations. Other TMDLs planned during the next MS4 Permit term include Big Bear Lake Nutrient TMDL (for all weather conditions), Big Bear Lake Mercury TMDL, Big Bear Lake and Rathbone Creek Sediment TMDL, and Big Bear Lake Watershed Metals TMDLs. The Permittees, within the affected watersheds, are required to participate in the development and implementation of those TMDLS. This Order may be reopened to incorporate any TMDLs_that may_be adopted and approved during the permit term.

An audit of each of the Permittees' storm water management programs during the third-term permit indicated no clear nexus between the watershed protection principles specified in the MSWMP and the WQMP and the Permittees' General Plan or related documents such as Development Standards, Zoning Codes, Conditions of Approval, Project Development Guidance, etc. It appears that aspects of the existing procedures, Development Standards, Ordinances and Municipal Codes may be barriers to implementation of watershed protection principles, especially low impact development techniques. This Order requires the Permittees to review and revise the Permittees' General Plan, Comprehensive or Master Plan, Municipal Codes, Subdivision Ordinances, Project Development Standards, Conditions of Approval or related documents to facilitate implementation of low impact development and other watershed protection principles.

The USEPA has recommended a shift to watershed-based NPDES permitting[29] and a watershed approach[30] to CWA programs, including NPDES programs. The Permittees

[29] EPA: Watershed-based NPDES permitting is a process that emphasizes addressing all stressors within a hydrologically-defined drainage basin, rather than addressing individual pollutant sources on a discharge-by-discharge basis.

[30] EPA (1996a): "The watershed approach is a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority problems within hydrologically defined geographic areas, taking into consideration both ground and surface water flow."

and the Regional Board also recognize that a watershed-based approach is expected to be effective in controlling pollutants in urban storm water runoff. Consistent with this approach, this Order requires the Permittees to develop, implement and monitor the effectiveness of a Watershed Action Plan that integrates hydromodification and water quality management strategies with land use planning policies, ordinances, and plans within each jurisdiction. A watershed approach considers the diverse pollutant sources and stressors and watershed goals within a defined geographic area (i.e., watershed boundaries) and it has three basic components: (1) *Geographic Focus*: Watersheds are nature's boundaries. They are the land areas that drain to surface waterbodies, and they generally include lakes, rivers, estuaries, wetlands, streams, and the surrounding landscape. Ground water recharge areas are also considered. (2) *Sound Management Techniques Based on Strong Science and Data*: Sound scientific data, tools, and techniques are critical to inform the process. Actions taken include characterizing priority watershed problems and solutions, developing and implementing action plans, and evaluating their effectiveness within the watershed. (3) *Partnerships/Stakeholder Involvement*: Watersheds transcend political, social, and economic boundaries. Therefore, it is important to involve all the affected interests in designing and implementing goals for the watershed. Watershed teams may include representatives from all levels of government, public interest groups, industry, academic institutions, private landowners, concerned citizens, and others.

To promote transparency and consistency within the permitted area, this Order requires each Permittee to develop its own local implementation plan (LIP) that specifies how each program element of the MSWMP and this Order will be implemented within its jurisdiction. The LIP shall specify the Permittee's legal authority and standard operating procedures including but not limited to its ordinances, plans, policies, procedures, personnel, tasks, schedules, checklists, educational materials, forms, maps of drainage areas, maps of wetlands or other environmentally sensitive areas, tools and resources utilized to implement the MSWMP requirements and requirements specified in this Order within its jurisdiction. The LIP shall identify the organizational units and personnel responsible for implementation of each program element, establish internal reporting requirements to ensure and promote accountability, and shall describe an adaptive method of evaluation and assessment of program effectiveness for the purpose of identifying program improvements.

The audits conducted by the Regional Board have also shown a need to improve program effectiveness assessment. This Order specifies quantifiable measures for evaluating program effectiveness.

The above-mentioned strategies for the fourth-term permit build upon and continue the programs and policies developed by the Permittees during the prior term permits as described in Sections VI and VII, above. A combination of these programs and policies and the requirements specified in this Order should improve control of pollutants in storm water runoff from storm water conveyance facilities owned and/or controlled by the permittees.

IX. PERMIT REQUIREMENTS

The legislative history of storm water statutes (1987 CWA Amendments), US EPA regulations (40CFR Parts 122, 123, and 124), and clarifications issued by the State Water Resources Control Board (State Board, Orders No. WQ 91-03 and WQ 92-04) indicate that a non-traditional NPDES permitting strategy was anticipated for regulating urban storm water runoff. Due to economic and technical infeasibility of full-scale end-of-pipe treatments and the complexity of urban storm water runoff quality and quantity, MS4 permits generally include narrative requirements for the implementation of BMPs in place of numeric effluent limits.

The requirements included in this Order are meant to specify those management practices, control techniques and system design and engineering methods that will result in maximum extent practicable (MEP) protection of the beneficial uses of the receiving waters. The State Board (Orders No. WQ 98-01 and WQ 99-05) concluded that MS4s must meet the technology-based MEP standard and water quality standards (water quality objectives and beneficial uses). The U. S. Court of Appeals for the Ninth Circuit subsequently held that strict compliance with water quality standards in MS4 permits is at the discretion of the permitting authority. Any requirements included in the Order that are more stringent than the federal storm water regulations is in accordance with the CWA Section 402(p)(3)(iii), and the California Water Code Section 13377 and are consistent with the Regional Board's interpretation of the requisite MEP standard.

The 2006 Report of Waste Discharge (ROWD) included a discussion of the current status of San Bernardino County's urban storm water management program and the proposed programs and policies for the next five years (fourth-term permit). A separate Municipal Storm Water Management Plan (MSWMP), submitted with the ROWD, defines the storm water programs and activities to be implemented during the fourth permit term and includes by reference a number of related documents such as the Water Quality Management Plan (WQMP). This Order incorporates these documents (2006 ROWD and MSWMP and other related documents).

This Order recognizes the significant progress made by the Permittees during the prior term permits in implementing various elements of the storm water program. This Order also recognizes regional and innovative solutions to such a complex problem, addresses deficiencies of the Permittees' storm water programs observed during the audits conducted by Regional Board staff, considers comments by the USEPA on other draft MS4 Permits and recommendations in the recently published report on Urban Storm Water Management by the National Research Council[31] (NRC) study. This Order specifies quantifiable performance measures to determine compliance and assess the effectiveness of the storm water programs. This Order incorporates an integrated watershed approach in solving water quality and hydromodification impacts resulting from urbanization and aims to promote low impact development techniques as a key element to mitigate impacts from new and redevelopment projects. The proposed permit also includes water quality based effluent limits based on wasteload allocations

[31] National Research Council Report (2008), http://www.nap.edu/catalog.php?record_id=12465

in approved TMDLs. The goal of these programs and policies that are included in this Order is to achieve and maintain water quality standards in the receiving waters.

The major requirements include: 1) Discharge prohibitions; 2) Effluent limitations and discharge specifications, including wasteload allocations for discharges to 303(d) listed waterbodies with adopted TMDLs and Permittees' De Minimus Discharges; 3) Receiving water limitations; 4) Legal authority and enforcement; 5) Prohibition on illicit connections and illegal discharges; 6) Control of sewage spills, sanitary sewer line leaks, septic system failures and portable toilet discharges; 7) Municipal inspection programs; 8) New development, including significant re-development requirements, including quantifiable measures for low impact development implementation and management of hydrologic conditions of concern and a time schedule to develop a watershed approach to address water quality and hydromodification issues; 9) public education and outreach; 10) Municipal facilities/activities; 11) Municipal construction projects; 12) Training program for storm water managers, planners, inspectors, and municipal contractors; and 13) Monitoring and reporting requirements.

These programs and policies are intended to improve urban storm water quality and protect the beneficial uses of receiving waters of the region.

1. DISCHARGE PROHIBITIONS

In accordance with CWA Section 402(p)(3)(B)(ii), this Order prohibits the discharge of non-storm water to the MS4s, with a few exceptions. The specified exceptions are consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). If the permittees or the Executive Officer determines that any of the exempted non-storm water discharges contain pollutants, a separate NPDES permit, a separate Waste Discharge Requirement or coverage under the Regional Board's De Minimus permit will be required.

2. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS, INCLUDING WASTE LOAD ALLOCATIONS FOR DISCHARGES TO 303(D) LISTED WATERBODIES WITH ADOPTED TMDLS

This Order regulates the discharge of urban runoff as per 40 CFR122.26(d)(2)(iv)(B)(1). This Order also regulates de minimus types of discharges from Permittees' facilities and/or operations. The Regional Board regulates some of the "authorized discharges" under the de minimus permit. The Permittees' de minimus discharges are subject to maximum daily concentration limits consistent with the Regional Board's General De Minimus Permit for Discharges to Surface Waters, Order No. R8-2009-0003, NPDES No. CAG 998001. Permittees' de-minimus discharges covered under this Order include: 1) dewatering wastes from subterranean seepage, except for discharges from utility vaults; 2) discharges resulting from hydrostatic testing of vessels, pipelines, tanks, etc.; 3) discharges resulting from the maintenance of potable water supply pipelines, tanks, reservoirs, etc.; 4) discharges resulting from the disinfection of potable water supply pipelines, tanks, reservoirs, etc.; 5) discharges from potable water supply systems resulting from initial system startup, routine startup, sampling

of influent flow, system failures, pressure releases, etc.; 6) discharges from fire hydrant testing or flushing; 7) swimming pool discharges; 8) discharges resulting from diverted stream flows; and 9) Construction dewatering wastes. This Order specifies procedures for Regional Board notification of Permittees' de-minimus discharges.

NPDES regulations at 40 CFR 122.44(d)(vii)(B) require that NPDES permits be consistent with wasteload allocations approved by the USEPA. Wasteload allocations in adopted TMDLs for the Middle Santa River (MSAR) Watershed Bacterial Indicator, and the Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions are included in this Order as Water Quality-Based Effluent Limitations (WQBELS). However, since the compliance dates of the adopted TMDLs are beyond the expected 5-year duration of this NPDES Permit, the Permittees are required to monitor and report effectiveness of the BMPs specified in the TMDL Implementation Plans and this Order with respect to pollutant reduction goal(s) as one measure of progress towards attainment of WLAs in accordance with the compliance schedules specified in the TMDL Implementation Plans. If water quality standards in the impaired receiving waters are met through implementation of appropriate control measures, the Basin Plan will be amended to revise the TMDLs.

3. RECEIVING WATER LIMITATIONS

Receiving water limitations are included to ensure that discharges from the MS4 systems do not cause or contribute to violations of applicable water quality standards in receiving waters. The compliance strategy for receiving water limitations is consistent with the USEPA and State Board guidance and recognizes the complexity of storm water management.

This Order requires the permittees to meet water quality standards in receiving waters in accordance with USEPA requirements, as specified in State Board Order No. WQ 99-05. If water quality standards are not met through implementation of BMPs, the permittees are required to re-evaluate the programs and policies and propose more effective BMPs. Compliance determination will be based on this iterative BMP implementation/compliance evaluation process.

4. LEGAL AUTHORITY/ENFORCEMENT

The Permittees have adopted a number of ordinances, municipal codes, and other regulations to establish legal authority, control discharges to the MS4s and enforce these regulations as specified in 40 CFR 122.26(d)(2)(i)(A, B, C, E, and F). The Permittees are required to enforce these ordinances and to take enforcement actions against violators (40 CFR 122.26(d)(2)(iv)(B-D)).

The third-term permit required the Permittees to establish the authority and resources to administer either civil or criminal penalties and/or penalties for violations of their local water quality ordinances. Although a few Permittees have imposed monetary penalties for repeated violations of its ordinances, program evaluations conducted during the third-term permit showed that enforcement

activities undertaken by a majority of the Permittees have consisted primarily of Notices of Violation (NOVs) that are mostly to educate the public on the environmental consequences of illegal discharges. In some cases, multiple NOVs and stop work orders were issued to the same facilities for recurring violations without progressive enforcement. In the case of San Bernardino County, additional action has sometimes included recovery of investigative and cleanup costs from the responsible party. In case of egregious or criminal violations, the option exists for referral to the County District Attorney for possible prosecution. The fourth-term permit requires the Permittees to document and implement progressive and decisive enforcement actions, evaluate the effectiveness of their enforcement program and sanctions by tracking compliance and evaluating the amount of time to return to compliance. This Order also requires the Permittees to establish the authority to immediately abate discharges to its MS4s caused by unresponsive dischargers and recover its costs.

Since the 2006 ROWD identified bacteria as the highest priority pollutant for the permitted area, this Order requires the Permittees to promulgate ordinances that would specify control measures for known pathogen or bacterial sources, such as animal wastes, if those types of sources are present within their jurisdiction.

This Order requires the Permittees to include in the Local Implementation Plan (LIP) their legal authority and mechanisms to implement the various program elements required by this Order to properly manage, reduce and mitigate potential pollutant sources within each Permittee's jurisdiction. The LIP shall include citations of appropriate local ordinances, identification of departmental jurisdictions and key personnel in the implementation and enforcement of these ordinances. The LIP shall include procedures, tools and timeframes for progressive enforcement actions and procedures for tracking compliance.

5. ILLEGAL DISCHARGES / ILLICIT CONNECTIONS TO MS4s, LITTER DEBRIS AND TRASH CONTROL

Federal regulation, 40 CFR 122.26(d)(2(iv)(B), requires the Permittees to eliminate illicit discharges to the MS4s. During the second-term permit, the Permittees completed a survey of the MS4 systems and eliminated or permitted all identified illicit connections. The Permittees have also established a program to address illegal discharges and a mechanism to respond to spills and leaks and other incidents of discharges to the MS4s. Program evaluations conducted during the third-term permit showed that this program element is primarily complaint driven or an incidental component of municipal inspections or conveyance system inspections.

This Order requires the Permittees to develop a plan for each jurisdiction to conduct focused, systematic field investigations, outfall reconnaissance survey, indicator monitoring, and track their sources[32]. A proactive illicit discharge

[32] Table 2: Land uses, Generating Sites and Activities that Produce Indirect Discharges from IDDE, A Guidance Manual for Program Development and Technical Assessments, October 2004 CWP.

detection and elimination (IDDE) program shall be integrated with other program elements including: GIS mapping of the Permittees' conveyance systems to track sources, aerial photography, municipal inspection programs for construction, industrial, commercial, storm drain systems, municipal facilities, etc., watershed monitoring, public education and outreach, pollution prevention, stream restoration efforts, and rapid assessment of stream corridors to identify dry weather flows and illegal dumping.

6. SEWAGE SPILLS, INFILTRATION INTO MS4 SYSTEMS, SANITARY SEWER LINE LEAKS, SEPTIC SYSTEM FAILURES AND PORTABLE TOILET DISCHARGES

Federal regulation, 40 CFR 122.26(d)(2)(iv)(B)(4), requires the Permittees to develop procedures to prevent, contain, and respond to spills that may discharge into the MS4s. The Permittees have already developed a program to address various types of spills to the MS4s. This Order requires the Permittees to continue to implement the unified sewer response plans in collaboration with the local sanitation districts. To facilitate swift response actions, the Permittees are required to provide 24-hour access to MS4s to the sanitation districts. The Permittees should also work cooperatively with the local sanitation districts to determine if exfiltration from leaking sanitary sewer lines is causing or contributing to urban storm water pollution problems. In addition, the Permittees are required to control infiltration or seepage from sanitary sewers to the MS4s through routine preventive maintenance of the storm drain system (40 CFR 122.26(d)(2)(iv)(B)(7)). This Order also requires the Permittees to implement control measures and procedures to prevent, respond to, contain and clean up all sewage and other spills from sources such as portable toilets and septic systems.

On May 2, 2006, the State Board issued the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ (SSO Order) to address proper management and operation of sewer collection systems and to control sanitary sewer overflows. It requires dischargers/enrollees to develop and implement a written Sewer System Management Plan (SSMP) approved by the discharger's governing board and report sewer spills through an on-line reporting system. This Order requires the Permittees to coordinate the review of the unified sewage spill response plan developed during the third-term permit with the local sewering agencies to make it consistent with the requirements of the SSO Order. This Order also requires each Permittee to include in its LIP the interagency or interdepartmental sewer spill response coordination and responsibilities.

The MS4 program audits indicated that a majority of the Permittees with septic systems have inadequate information with regard to the number and location of systems within their jurisdiction. This Order requires the Permittees to develop an inventory of septic systems within its jurisdiction and establish a program to ensure that septic system failure rates are minimized.

7. MUNICIPAL INSPECTION PROGRAM

Federal regulations, 40 CFR 122.26(d)(2)(iv)(A-D), require the Permittees to inventory, prioritize and inspect industrial, construction and commercial facilities. The third-term permit required the Permittees to inventory construction, industrial and commercial facilities within their jurisdiction and to prioritize them for inspection based on threat to water quality. The permit specified the frequency at which high, medium, low priority sites are to be inspected. During the third-term permit, the Permittees proposed to develop a risk-based scoring system to prioritize facilities for inspections. Until approval of this risk-based prioritization system, the Permittees are required to continue the inspection program and prioritize facilities for inspection based on threat to water quality as specified in the third-term permit.

An evaluation of the municipal inspection programs during the third-term permit indicated certain deficiencies in the commercial, industrial and construction programs of some of the Permittees. In many instances, program documentation of progressive enforcement and facilities' return to compliance were not properly documented. This Order requires Permittees to document inspections and enforcement and evaluate the effectiveness of their inspection and enforcement program by tracking the time for facilities to return to compliance. During the third-term permit, most of the Permittees utilized the MS4 Solution Database to document their facility inventory, inspections and enforcement activities. This Order requires the Permittees to update the information in the MS4 Solution Database or use an equivalent web accessible database on a regular basis. The Permittees who do not have an internet accessible database shall initiate quarterly reporting and update of the inventory, inspection and enforcement database for facilities within their jurisdiction.

In order to address discharges to the MS4s from residential sources, the fourth-term permit requires the Permittees to develop and implement a residential program to prevent residential discharges from causing or contributing to a violation of water quality standards in the receiving waters (40 CFR 122.26(d)(2)(iv)(A)).

8. NEW DEVELOPMENT AND SIGNIFICANT REDEVELOPMENT

Federal regulation, 40 CFR 122.26(d)(2)(iv)(A)(2), requires the Permittees to develop a comprehensive master plan to address discharges from new and significant redevelopment projects. During the third-term permit, the Permittees revised their new development guidelines to address water quality and hydromodification impacts resulting from urbanization. A Water Quality Management Plan Guidance and Template was approved by the Regional Board in 2004 and amended in 2005. The Permittees were required to review and approve project-specific Water Quality Management Plans (WQMP) to address post-construction impacts. The WQMP should be designed to address water quality impacts, including hydrologic conditions of concern, from new and significant redevelopment projects through: (1) site design BMPs, including low impact development (LID) techniques; (2) source control BMPs; and (3) treatment control BMPs. This Order recognizes the importance of LID techniques to minimize the impact of urbanization on water quality. The fourth-term permit requires the project

proponents to infiltrate, harvest and reuse, evapotranspirate, or bio-treat the volume of runoff from a 24-hour, 85th percentile storm event where feasible. The Order also provides alternatives and in-lieu programs for project sites where infiltration, harvesting and re-use, evapotranspiration and bio-treatment are not feasible.

Program evaluations conducted during the third-term permit indicated a need for establishing a need for improved integration between the watershed protection principles, including LID techniques into the planning and approval processes of the Permittees. This Order requires the Permittees to review and revise their Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance, ordinances, and other related documents, where feasible, to identify and eliminate barriers to incorporate watershed protection principles.

The Southern California Monitoring Coalition (SMC), including project lead agency, the San Bernardino County Flood Control District, in collaboration with SMC members, Southern California Coastal Water Research Project (SCCWRP) and the California Storm Water Quality Association (CASQA), is developing a Low Impact Development Manual for Southern California with funding from the State Water Resources Control Board, CASQA and the SMC. This manual will be incorporated into the CASQA BMP Handbooks. The Permittees are encouraged to utilize the manual as a resource for proper LID design and implementation techniques.

Program evaluations have also shown deficiencies in the Permittees' inspection, and tracking of post-construction BMPs. This Order requires the Permittees to revise their close-out procedures to include field verification that site design, source control and treatment control BMPs are operational and consistent with the approved WQMP.

This Order incorporates new project categories and revised thresholds for several categories of new development and redevelopment projects that trigger the requirement for a WQMP. The 2008 National Research Council (NRC) report[33] indicates that roads and parking lots constitute as much as 70% of total impervious cover in ultra-urban landscape, and as much as 80% of the directly connected impervious cover. Roads tend to capture and export more storm water pollutants than other impervious covers. As such, the Permittees are required to develop a standard design and post-development BMP guidance for streets, roads, highways, and freeway improvements that meet the performance standards for site design/LID BMPs, source control, treatment control as well as hydromodification control. The NRC report also indicates that there is a direct relationship between impervious cover and the biological condition of downstream receiving waters. The Permittees are required to address hydrologic conditions of concern from new development and significant redevelopment projects to minimize downstream impacts.

Consistent with a long term holistic approach to address water quality and hydromodification impacts resulting from urbanization, this Order requires Permittees to develop a Watershed Action Plan that integrates, to the extent

[33] National Research Council Report (2008), http://www.nap.edu/catalog.php?record_id=12465

practicable, water quality, stream protection, storm water management and re-use strategies with land use planning policies, ordinances, and plans within each jurisdiction. These plans should address cumulative impacts of development on vulnerable streams, preserve or restore, consistent with the maximum extent practicable standard, the structure and function of streams, and protect surface and groundwater quality. The Order specifies that the Watershed Action Plan include strategies for addressing (303(d) listed waterbodies with adopted TMDLs with or without implementation plans as well as those impaired water bodies without a TMDL. The Permittees are also required to participate in TMDL development and implementation.

9. PUBLIC AND BUSINESS EDUCATION AND OUTREACH PROGRAMS

Federal regulation, 40 CFR 122.26(d)(iv), requires the Permittees to develop a comprehensive storm water management plan with public participation and 40 CFR 122.26(d)(iv)(B)(6) requires the Permittees to engage in outreach activities to facilitate the proper management of pollutants. Public outreach is an important element of the overall urban pollution prevention program. The Permittees have implemented a strategic and comprehensive public education program to preserve and enhance the quality of receiving waters. The Principal Permittee has taken the lead role in the outreach programs and has targeted various groups including businesses, industry, commercial enterprises, developers, utilities, environmental groups, institutions, homeowners, school children, and the general public. The Permittees have developed a number of educational materials, have established a storm water pollution prevention hotline and website, started an advertising and educational campaign, and distribute public education materials at a number of public events. The Permittees are required to continue these efforts and to expand their public participation and education programs by participating in joint outreach programs with other agencies including, but not limited to, the SWQSTF, Caltrans, and other municipal storm water programs.

This Order also requires the Permittees to develop and distribute fact sheets/BMPs to address sources from residential sources such as: (1) auto washing and maintenance activities; (2) use and disposal of pesticides, herbicides, fertilizers and household cleaners; and (3) collection and disposal of pet wastes.

The Permittees are required to review their public education and outreach efforts and revise these activities, if necessary, to address public outreach needs.

Federal regulation, 40 CFR 122.26(d)(v), requires the Permittees to conduct a program assessment to determine the reduction in pollutant loadings due to urban storm water runoff management programs. Each Permittee is required to implement an assessment program, guided by the CASQA Program Effectiveness Guidance manual or equivalent alternative.

10. MUNICIPAL FACILITIES AND ACTIVITIES

Federal regulation, 40 CFR 122.26(d)(iv)(A), requires the Permittees to ensure that public agency activities and facilities do not cause or contribute to violations

of water quality standards in receiving waters. The third-term permit incorporated performance commitments in the ROWD to prevent public agency facilities and activities from causing or contributing to a pollution or nuisance in receiving waters. The Permittees were also required to develop and distribute BMP fact sheets for various public agency activities. The third-term permit also specified minimum requirements for street sweeping and inspection and maintenance of drainage facilities. Permittee as well as contract staff that perform public agency activities were required to be properly trained.

Program evaluations conducted during the third-term permit indicated varying degrees of compliance at public agency facilities and activities. This Order requires each Permittee to inventory and inspect its fixed facilities, field operations and drainage facilities to ensure that public agency facilities do not cause or contribute to a pollution or nuisance in receiving waters.

Fixed public facilities and field operations include, but are not limited to, public streets and roads, parking facilities, fire training facilities, flood management and conveyance systems, POTWs, solid waste transfer facilities, land application sites, corporate yards, maintenance and storage yards, household hazardous waste collection facilities, municipal airfields, recreational facilities, and special event or festival venues. The Permittees are required to include in their local implementation plan procedures and schedules for inspections and maintenance of public agency facilities and activities.

11. MUNICIPAL CONSTRUCTION PROJECTS

The third-term permit authorized the discharge of storm water from construction activities on one acre or more that are under ownership or direct responsibility of the Permittees. The Permittees were required to notify the Executive Officer prior to commencement of construction activities, and to comply with the substantive requirements of the latest Statewide General Construction Activities Storm Water Permit.

Program evaluations conducted during the third-term permit indicated that some of the Permittees were not submitting or were not aware of the requirement to submit a Notice of Construction or Permit Registration Documents (PRDs) and a Notice of Completion for municipal construction projects.

This Order continues the requirement of the third-term permit and builds upon it by requiring Permittees to include post-construction BMP information for municipal projects along with the Notice of Termination submitted to the Executive Officer upon completion of the construction activity. The Notice of Termination must include photographs of the completed project, a location map, structural post-construction BMP location, field verification report and long term operation and maintenance responsibility. The Permittees are required to develop a database of post-construction BMPs for which the Permittees are responsible and shall reference this database in the local implementation plans.

Emergency public work projects required to protect public health and safety are exempted from these requirements, until the emergency ends, at which time they need to comply with the requirements.

12. TRAINING PROGRAM FOR STORM WATER MANAGERS, PLANNERS, INSPECTORS, AND MUNICIPAL CONTRACTORS

Education of municipal planning, inspection, and maintenance staff is critical to ensure that land use decisions, local permit approvals and municipal facilities and activities do not cause or contribute to an exceedance of receiving water quality standards. During the third-term permit, the Permittees developed a web-based training program to provide better access to specific training elements. The Municipal Activities Pollution Prevention Strategy (MAPPS) online-training program addressed BMPs for public agency facilities and activities.

This Order requires the Permittees to define the necessary expertise and competencies for various job functions involved in the implementation of the areawide and local storm water programs and to develop an appropriate curriculum. The Permittees are required to conduct the training program for field operations and municipal inspection staff, for storm water managers, and for those involved in the review and approval of WQMPs and CEQA documents. The training curriculum should address the need for interdepartmental collaboration and communication to address issues related to storm water pollution controls.

13. MONITORING AND REPORTING REQUIREMENTS

Prior monitoring programs conducted by the Permittees consisted of drainage area characterization, BMP evaluation, storm water, and receiving water monitoring. These early programs focused on identifying pollutants, estimating pollutant loads, tracking compliance with water quality objectives, and identifying sources of pollutants. The San Bernardino County monitoring program, as well as other monitoring programs nationwide, has shown that there is a high degree of uncertainty in the quality of storm water runoff and that there are significant variations in the quality of urban runoff spatially and temporally. However, most of the monitoring programs to date have indicated that there are a number of pollutants in urban storm water runoff. A definite link between pollutants in urban runoff and beneficial use impairments has been established at least in a few studies.

To date, wet weather monitoring has shown elevated pollutant concentrations at monitoring Sites 2, 3 and 5. Monitoring Site 2 is located 400 feet south of Freeway 60, west of Archibald Avenue, on the east side of Cucamonga Creek Channel, in the City of Ontario. Land use within this drainage area is primarily commercial and industrial. Site No. 3 is located at Hellman Avenue, between Pine Avenue/Schleisman Road and Chino-Corona Road/Chandler Street, 75 feet east of Hellman Avenue bridge on the south side of Cucamonga Creek Channel

near the City of Chino on the San Bernardino County/Riverside County line. This site is mainly agricultural. Site No. 5 is located in the Hunts Lane access road north of Hospitality Lane, within a manhole located in the asphalt parking lot behind a group of commercial facilities in the City of San Bernardino. This site receives flows from predominantly restaurants and other businesses in the area. Using wet weather monitoring data from 1994-99, the 2000 ROWD identified Site 5 to have the highest average concentration for BOD, copper, zinc, and TSS while Site 3 has the highest average concentrations for nitrate and phosphorus. First flush data from the 1999-2000 monitoring events showed elevated levels consistent with prior years' data for Sites 2, 3, and 5. During the third-term permit, a Pollutant Source Investigation and Control Plan[34] was developed and implemented to investigate elevated pollutant concentrations of coliform bacteria, zinc, copper and lead at Site 5. This Order requires continued implementation of the plan, including annual reporting and BMP effectiveness evaluation for the Site 5 drainage area. This Order also requires the Permittees to continue first flush monitoring at storm drain monitoring Sites 2, and 3 to refine source identification and control techniques. Some of these efforts may be blended into the Watershed Action Plan that is required under the proposed Order.

The Order also requires the Permittees to participate in monitoring programs to support TMDL development and implementation. The Permittees are also participating in several other monitoring-related activities, including Comparative Evaluation of Microbial Source Tracking Techniques, Model Monitoring Program Guidance, Peak Flow Study, and Laboratory Inter-Calibration. Under the auspices of the Storm Water Monitoring Coalition, Southern California Coastal Water Research Project prepared "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California", August 2004 Technical Report No. 419. This report noted, ".the lack of mass emissions stations in the inland counties hampers their ability to estimate the proportional contribution of these inland areas to cumulative loads downstream." The coalition consists of representatives from the Counties of Ventura, Los Angeles, Long Beach, Orange, San Bernardino, Riverside, and San Diego. An integrated Watershed Monitoring Plan should address any shortcomings in the overall monitoring programs and avoid duplicative efforts within the same watershed.

This Order requires the Permittees to continue their participation in these watershed coordination efforts. The third-term permit required the Permittees to initiate bioassessement monitoring. To allow for a holistic approach, this Order requires the Permittees to participate in the Regional Integrated Freshwater Bioassessment Monitoring Program in lieu of a separate bioassessment monitoring program for the permitted area.

This Order requires the Permittees to re-evaluate their Water Quality Monitoring Plan and submit a revised plan for approval. The revised integrated watershed monitoring program should integrate the goals and objectives of the Watershed Action Plan and rectify data gaps from previous monitoring efforts.

[34] 2005-2006, 2006-2007, 2007-2008 Annual Reports

X. WATER QUALITY BENEFITS/COST ANALYSIS/FISCAL ANALYSIS

There are direct and indirect benefits from clean beaches, clean water, and clean environment. It is difficult to assign a dollar value to the benefits the public derives from fishable and swimmable waters. In 1972, at the start of the NPDES program, only 1/3 of the U.S. waters were swimmable and fishable. In 2008, more than 2/3 of the U.S. waters meet these criteria. In the November 1999 "*Money*" magazine survey of the "Best Places to Live," clean water and air ranked as two of the most important factors in choosing a place to live. Thus, environmental quality has a definite link to property values. Clean lakes and beaches and other water recreational facilities also attract tourists.

The true magnitude of the urban runoff problem is still elusive and any cost estimate for cleaning-up urban runoff would be premature short of end-of-pipe treatments. For urban storm water runoff, end-of-pipe treatments are cost prohibitive and are not generally considered as a technologically feasible option. Over the last decade, the Permittees have attempted to define the problem and implemented best management practices to combat the problem. The costs incurred by the Permittees in implementing these programs and policies are included in the annual reports.

The area-wide program is funded by the Permittees. The Principal Permittee prepares an annual budget for the Management Committee. The Principal Permittee allocates 95 percent of the approved budget costs to the co-permittees based on percentage calculated using the cost allocation formula defined in the Implementation Agreement.

The costs incurred by the Permittees in implementing these programs and policies can be divided into two broad categories (the costs indicated below are for the entire San Bernardino County storm water program):

1. Shared costs: These are costs that fund activities performed mostly by the Principal Permittee under the Implementation Agreement. These activities include overall storm water program coordination; intergovernmental agreements; representation at the California Storm Water Quality Association, Regional Board/State Board meetings and other public forums; preparation and submittal of compliance reports and other reports required under the NPDES permits and Water Code Section 13267, budget and other program documentation; coordination of consultant studies, co-permittee meetings; training seminars, water quality monitoring, and Countywide pubic education and outreach. Actual area-wide storm water program expenditures have increased from $571,000 for FY 1995-96 (2nd term) to $1,593,000 in FY 2006-07 (3rd term). During the third-term permit there has been an increase of about 15%/year from 2002-2007 in these program expenses. The Storm Water Program had allocated a budget of $1,735,500 for FY 2007-08 and proposed a budget of $1,765,500 for FY 2008-2009[35]. Below is a breakdown of the expenditure items and the corresponding percentage weight in the total budget.

The permittees identified the following budget for Fiscal Year (2008-2009):

[35] San Bernardino County Storm water Program, Annual Report for Reporting Year (Fiscal Year) July 2007-June 2008, Nov 2008.

EXPENDITURE ITEMS	AMOUNT ($)	PERCENTAGE
Public Education Program	300,000	18.69
Big Bear Lake TMDL	250,000	15.58
Administration	170,000	10.59
Chino Basin TMDL Implementation (Middle Santa Ana River)	160,000	9.97
MS4 Database Development	150,000	9.35
Storm Water Quality Standards Study (SAWPA)-Phase 3	150,000	9.35
Monitoring Program	100,000	6.23
Training	100,000	6.23
Participation in Regional Monitoring Program (SCCWRP)	70,000	4.36
Annual Report Preparation	50,000	3.12
Consultant Costs	30,000	1.87
Participation in Statewide Storm Water Issues (CASQA)	30,000	1.87
HCOC Map and Documentation	25,000	1.56
Permit Renewal Tasks	20,000	1.25
Subtotal	**1,605,000**	
Approved Reserved Fund (2008-09)	160,500	
Total Budget	1,765,500	

2. Individual Costs for ROWD/MSWMP Implementation for the third-term permit: These are costs incurred by each Permittee for implementing programs that complement the NPDES program by reducing the potential for pollutants to enter the storm drain system. Most of these programs existed prior to the MS4 program and these include: (1) street sweeping; (2) hazardous waste collection and recycling; and (3) storm drain and other municipal facilities maintenance. The MSWMP required additional programs and policies to ensure that these activities were not a significant contributor of pollutants to the MS4s and the receiving waters. In 2006/07, the Permittees determined their total Individual Costs for these programs to be $60.138 million.

Funding sources for the Storm Water Program for individual permittees are General Funds, capital funds, storm drain fees, sewer funds, storm water management fees,

development fees, licensing fees, plan check fees, NPDES construction inspection fees, business license fees, gas tax, utility tax, solid waste funds, and others.

XI. ANTIDEGRADATION ANALYSIS

The Regional Board has considered whether a complete antidegradation analysis, pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16, is required for the storm water discharges. The Regional Board finds that the pollutant loading rates to the receiving waters will be reduced with the implementation of the requirements in this Order. As a result, the quality of storm water discharges and receiving waters will be improved, thereby improving protection for the beneficial uses of waters of the United States. Since this Order will not result in a lowering of water quality, a complete antidegradation analysis is not necessary, consistent with the federal and state antidegradation requirements.

XII. ANTI-BACKSLIDING

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations of 40 CFR 122.44(*l*) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order. Therefore this Order conforms with the anti-backsliding requirements of the CWA.

XIII. PUBLIC WORKSHOPS

The Regional Board conducted a public workshop on the first draft of the Order on August 3, 2009 at the Loma Linda City Council Chambers.

XIV. PUBLIC HEARING

The Regional Board will hold a public hearing (scheduled to start at 9:00 a,m,) regarding the proposed waste discharge requirements on January 29, 2010 at the City Council Chambers, City of Loma Linda, 25541 Barton Road, Loma Linda, CA. A Notice of Public Hearing was published in the Legal Notices section of The Sun, a local newspaper, on November 13, 2009. Further information regarding the conduct and nature of the public hearing concerning these waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, CA 92501-3348. This and other information are also available at the website at: www.waterboards.ca.gov/santaana. A Notice of Public Hearing and Hearing Procedure is also posted on the Regional Board's website at:

http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/san_bernardino_permit.shtml.

XV. INFORMATION AND COPYING

Persons wishing further information may write to the above address or call Maria Macario at (951) 321-4583 or email at mmacario@waterboards.ca.gov. Copies of the application, proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday (excluding holidays).

XVI. REGISTER OF INTERESTED PERSONS

Any person interested in a particular application or group of applications may leave his/her name, address, and phone number as part of the file for an application. Copies of the final waste discharge requirements will be emailed to all interested parties.

E-mail registration:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg8_subscribe.shtml

In addition to the permittees, comments were solicited from the following agencies and/or persons:

Government Agencies

U. S. Environmental Protection Agency – John Kemmerer/Eugene Bromley (W-5-1)
US Army District, Los Angeles, Corps of Engineers - Permits Section
NOAA, National Marine Fisheries Service
US Fish and Wildlife Service – Carlsbad
U.S. Department of Agriculture - Forest Services, San Bernardino County National Forest
California Department of Transportation (Cal Trans), District 8, Paul Lambert
California Department of Parks and Recreation - Chino Hills State Park
Inland Valley Development Agency, San Bernardino International Trade Center and Airport
State Water Resources Control Board – David Rice, Office of the Chief Counsel
State Water Resources Control Board – Bruce Fujimoto, Division of Water Quality
State Department of Water Resources - Glendale
California Regional Water Quality Control Board, North Coast Region (1) – Executive Officer
California Regional Water Quality Control Board, San Francisco Bay Region (2) - Executive Officer
California Regional Water Quality Control Board, Central Coast Region (3) - Executive Officer
California Regional Water Quality Control Board, Los Angeles Region (4) - Executive Officer
California Regional Water Quality Control Board, Central Valley Region (5S) - Executive Officer
California Regional Water Quality Control Board, Central Valley Region (5R) – Assistant Executive Officer

California Regional Water Quality Control Board, Central Valley Region (5F) – Assistant Executive Officer
California Regional Water Quality Control Board, Lahontan Region (6SLT) - Executive Officer
California Regional Water Quality Control Board, Lahontan Region (6V) – Assistant Executive Officer
California Regional Water Quality Control Board, Colorado River Basin Region (7) - Executive Officer
California Regional Water Quality Control Board, San Diego Region (9) - Executive Officer
California Department of Fish and Game - Ontario
California Department of Public Health – San Bernardino
California Department of Parks and Recreation - Perris
South Coast Air Quality Management District - Diamond Bar
Riverside County Flood Control District – Jason Uhley
Orange County Public Works Department - Chris Crompton/Richard Boone

Interested Parties

AEI/CASC – Jeff Endicott
URS/Greiner - Bob Collacott
Building Industry Association –Mark Grey
Latham & Watkins – Paul Singarella/Shirin Zandipour
Best, Best, and Krieger
Southern California Association of Governments (SCAG), Los Angeles
San Bernardino Associated Governments (SANBAG)
Santa Ana Watershed Project Authority - Celeste Cantu
Inland Empire West Resource Conservation District - General Manager

Universities and Colleges (Chancellor)

California State University - California State University San Bernardino
San Bernardino Community College District - Chaffey College Campus
San Bernardino Community College District - Crafton Hills College Campus
San Bernardino Community College District - San Bernardino Valley College Campus
University of Redlands
Loma Linda University

School Districts (Superintendent)

Alta Loma Elementary School District
Bear Valley Unified School District
Central Elementary School District
Chaffey Joint Union High School District
Chino Valley Unified School District
Colton Joint Unified School District
Cucamonga Elementary School District
Etiwanda Elementary School District

Fontana Unified School District
Mountain View Elementary School District
Mt. Baldy joint Elementary School District
Ontario-Montclair Elementary School District
Rialto Unified School District
Rim of the World Unified School District
Redlands Unified School District
San Bernardino City Unified School District
Upland Unified School District
Yucaipa Joint Unified School District

Hospitals (Administrator)

Bear Valley Community Hospital
Chino Community Hospital
Doctors Hospital
Kaiser Foundation Hospital
Loma Linda Community Hospital
Loma Linda University Medical Center
Mountains Community Hospital
Ontario Community Hospital
Patton State Hospital
Redlands Community Hospital
St. Bernardine Medical Center
San Antonio Community Hospital
San Bernardino Community Hospital
San Bernardino County Hospital

Environmental Organizations

Lawyers for Clean Water – Daniel Cooper
Orange County Coastkeeper – Garry Brown
Inland Empire Waterkeeper - Autumn DeWoody
Defend the Bay – Bob Caustin
Sierra Club, San Gorgonio Chapter
Natural Resources Defense Council (NRDC) – David Beckman/Bart Lounsbury
Cousteau Society
Audubon Sea & Sage Chapter

Newspapers

Press Enterprise
Inland Valley Daily Bulletin
Big Bear Grizzly
Chino-Chino Hills Champion Newspapers
Fontana Herald News
Highland Community News
Redlands Daily Facts
San Bernardino Sun
Los Angeles Times

Orange County Register

Railroads

AT&SF Railway Company
Union Pacific Railroad Company
BNSF Railway Company

Water Districts (General Manager)

Big Bear Municipal Water District
Inland Empire Utilities Agency
Cucamonga Valley Water District
East Valley Water District
Monte Vista Water District
San Bernardino Valley Municipal Water District
West San Bernardino County Water District
Yucaipa Valley Water District Orange County Water District
Metropolitan Water District
Western Municipal Water District
Orange County Water District

ATTACHMENT 7

CALIFORNIA REGIONAL WATER QUALITY CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – SANTA ANA REGION

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE SAN BERNARDINO COUNTY MUNICIPAL STORMWATER PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

ORDER No. R8-2010-0036 (NPDES No. CAS618036)

MARK ONLY ONE ITEM 1. ☐ New Construction / Reconstruction 2. ☐ Change of Information for WDID# _____

I. OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) – Fax ( ) – Email :

II. CONTRACTOR INFORMATION

Name	Contact Person		
Local Mailing Address	Title		
City	State	Zip	Phone ( ) – Fax ( ) – Email:

III. SITE INFORMATION

A. Project Title	Site Address		
City	State	Zip	Contact Person Phone ( ) –
B. Construction commencement date: (Month / Day / Year)	C. Projected construction completion date: (Month / Day / Year)		

D. Type of Work: ☐ Utility ☐ Flood Control ☐ Transportation ☐ Other (Specify)

Description of Work: _____

E. Total size of project/construction site: ____Acres

Total size of area to be disturbed: ____Acres.

IV. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☐ Indirectly to waters of the U.S.
2. ☐ Storm drain system - Enter owner's name:_____
3. ☐ Directly to waters of U.S. (e.g. , river, lake, creek, stream, or to a pipe/channel that flows without inflow from other sources between site and water body etc.)

V. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (mark one)

☐ A SWPPP has been prepared for this facility and is available for review

☐ A SWPPP will be prepared and ready for review by (date): ___/___/___

B. Date WQMP approved by local agency: ___/___/___ ☐ Not Applicable.

C. MONITORING PROGRAM (MP) (mark one)

☐ A MP has been prepared for this facility and is available for review

☐ A MP will be prepared and ready for review by (date): ___/___/___

VI. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that the Provisions of Section No. XIV of Order No. R8-2010-0036, including the development and implementation of a WQMP, a Storm Water Pollution Prevention Plan (SWPPP) and a Monitoring Program (MP), will be complied with."

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

ATTACHMENT 8

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – SANTA ANA REGION

NOTICE OF TERMINATION

OF COVERAGE UNDER THE SAN BERNARDINO COUNTY MUNICIPAL STORMWATER PERMIT
FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

ORDER No. R8-2010-0036 (NPDES No. CAS618036)

I. WDID No. _____

II. OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) – Fax ( ) – Email:

III. SITE INFORMATION

A. Original Project Title	Site Address		
City/Unincorporated Area	State CA	Zip	Site Contact Person
B. Contractor Name	Phone ( ) – Fax ( ) – Email:		Title
Local Mailing Address	City	State	Zip
Qualified SWPPP Practitioner	Phone ( ) – Fax ( ) – Email:		

IV. BASIS OF TERMINATION

__ 1. The construction project is completed and the following conditions have been met.

- ☐ All elements of the Storm Water Pollution Prevention Plan have been completed.
- ☐ Construction materials and waste have been disposed of properly.
- ☐ The site is in compliance with all local storm water management requirements.
- ☐ A post-construction storm water operation and management plan is in place (Attach a description of the post construction BMPs, the location (Latitude /Longitude), and a map of the locations of the PCBMPs).
- ☐ Field Verification Inspection (include a copy of the report) performed on ___/___/___ by Name_____

__ 2. Construction activities have been suspended; either temporarily ____ or indefinitely ___ and the following conditions have been met.

- ☐ All elements of the Storm Water Pollution Prevention Plan have been completed.
- ☐ Construction materials and waste have been disposed of properly.
- ☐ An effective combination of erosion and sediment control is in place for all denuded areas and other areas of potential erosion.
- ☐ The site is in compliance with all local storm water management requirements.

Date of suspension ____ / ____ / ____ Expected start up date ____ / ____ / ____

IV. CERTIFICATION

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by NPDES General Permit No. CAS000002 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the General Permit, and that discharging pollutants in storm water associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner of liability for any violation of the General Permit or the Clean Water Act.

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

ATTACHMENT 9

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION
NOTICE OF INTENT
TO COMPLY WITH THE TERMS AND CONDITIONS OF THE

☐ **Riverside County MS4 Permit**
ORDER NO. R8-2010-0033
NPDES NO. CAS 618033

☐ **San Bernardino County MS4 Permit**
ORDER NO.R8-2010-0036
NPDES NO. CAS618036

GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISCHARGE TO SURFACE WATERS THAT POSE INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY

I. PERMITTEE (*Person/Agency Responsible for the Discharge*)
Agency/Company
Name:_____
Address/*Street* _____
City _____State _____ZIP_____Contact Person:_____
Phone: (_____)_____; Email: _____

II. FACILITY
Name:_____
Address/Street _____
City _____State _____ZIP_____Contact Person:_____
Phone: (_____)_____; Email: _____

a. Projected Flow Rate (gpd):_____,
b. Receiving Water (identify):_____

III. INDICATE EXISTING PERMIT NUMBER: (*if applicable*)
a. Individual Permit Order No. _____ NPDES No. _____
b. General Permit Order No. R8-2010-003-_____
c. Others (specify) _____

IV. CERTIFICATION:

I certify under penalty of law that I am an authorized representative of the permittee and that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the permittee will comply with the terms and conditions stipulated in Orders No. R8-2009-0003 and (R8-2010-0033 or R8-2010-0036, as applicable) including the monitoring and reporting program issued by the Executive Officer of the Regional Board.

Name:_____Title:_____
(type or print)

Signature: _____ Date: _____

Email: _____

Remarks: If changes to facility ownership and/or treatment processes were made after the issuance of the existing permit, please provide a description of such changes on another sheet and submit it with this Notice of Intent.

V. OTHER REQUIRED INFORMATION - FOR NEW DISCHARGERS AND FOR NEW DISCHARGES AND LOCATIONS NOT PREVIOUSLY REPORTED BY EXISTING DISCHARGERS.

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to:

a. A list of constituents and the discharge concentration of each constituent;

b. The estimated average and maximum daily flow rates at unit of gallons per day(gpd); the frequency and duration of the discharge and the date(s) when discharge will start;

c. The proposed discharge location(s) as latitude and longitude for each discharge point;

d. A description of the proposed treatment system (if appropriate);

e. The affected receiving water; the receiving water(s) shall be
   1) receiving storm drain/creek, and/or
   2) the ultimate receiving water, such as Santa Ana River, San Jacinto River, Lake Elsinore, Prado Park Lake, etc.;

f. A map showing the path from the point of initial discharge to the ultimate receiving water. Please try to limit your maps to size of 8.5" X 11".

g. A list of known or suspected leaking underground tanks and other facilities or operations that have, or may have impacted the quality of the underlying groundwater within 200 feet of the site property lines for projects with expected discharge flow rates of less than 100,000 gallons per day and within 500 feet of the site property lines for projects with expected discharge flow rates of greater than 100,000 gallons per day.

h. Any other information deemed necessary by the Executive Officer.

VI. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your application, pursuant to Division 7, Section 13260 of the California Water Code.

15. **Risk Level 2 – NAL Exceedance Report**

a. In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 2 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

c. Risk Level 2 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 2 dischargers shall include in the NAL Exceedance Report:

   i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit").

   ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

   iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

Table 3 – Risk Level 2 Test Methods, Detection Limits, Reporting Units and Applicable NALs/NELs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2 Discharges other than ATS	1	NTU	250 NTU
		For ATS discharges	1	NTU	N/A

ATTACHMENT E
RISK LEVEL 3 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 3 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric –Risk Level 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 3 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 3 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 3 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

   a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

   b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

   c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

   d. Cover waste disposal containers at the end of every business day and during a rain event.

   e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

   f. Contain and securely protecting stockpiled waste material from wind and rain at all times unless actively being used.

   g. Implement procedures that effectively address hazardous and non-hazardous spills.

   h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

      i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 3 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 3 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 3 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 3 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 3 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 3 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 3 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 3 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 3 dischargers shall implement effective wind erosion control.

2. Risk Level 3 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 3 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 3 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

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[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.
[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage
[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

8. **Additional Risk Level 3 Requirement:** The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

F. Run-on and Run-off Controls

Risk Level 3 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 3 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 3 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 3 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 3 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 3 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

    a. Inspection date and date the inspection report was written.

    b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

    c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

    d. A description of any BMPs evaluated and any deficiencies noted.

    e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

    f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

    g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

    h. Photographs taken during the inspection, if any.

i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address.
   b. Calculated Risk Level (2 or 3).
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.

4. **Additional Risk Level 3 Requirement:** The QSP shall include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase.
   b. Trades active on the construction site during each construction phase.
   c. Trade contractor information.
   d. Suggested actions for each project phase.

5. **Additional Risk Level 3 Requirement:** The QSP shall develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

a. Site Address.
b. Calculated Risk Level (2 or 3).
c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
f. Trades active on site during Inactive Construction.
g. Trade contractor information.
h. Suggested actions for inactive construction sites.

6. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 3 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
3	X	X	X	X	X	X	X[4]

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Program in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

[4] When receiving water monitoring trigger is exceeded

a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of this General Permit.

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 3 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 3 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 3 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 3 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 3 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 3 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i. and c.iii above, Risk Level 3 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 3 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 3 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 3 – Water Quality Sampling and Analysis**

a. Risk Level 3 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 3 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 3 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 3 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

e. Risk 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event.

Receiving Water Monitoring Requirements

f. In the event that a Risk Level 3 discharger's effluent exceeds the daily average receiving water monitoring trigger of 500 NTU turbidity or the daily average pH range 6.0-9.0 contained in this General Permit and has a direct discharge into receiving waters, the Risk Level 3 discharger shall subsequently sample receiving waters (RWs) for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit. If a Risk Level 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

g. Risk Level 3 dischargers disturbing 30 acres or more of the landscape and with direct discharges into receiving waters shall conduct or participate in benthic macroinvertebrate bioassessment of RWs prior to commencement of construction activity (See Appendix 3).

h. Risk Level 3 dischargers shall obtain RW samples in accordance with the Receiving Water sampling location section (Section I.5), below.

5. **Risk Level 3 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

a. Risk Level 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 3 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 3 dischargers shall ensure that storm water discharge collected and observed represent[5] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 3 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 3 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 3 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 "Storm Water Sample Collection and Handling Instructions" below.

Receiving Water Sampling Locations

h. **Upstream/up-gradient RW samples**: Risk Level 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible and upstream from the effluent discharge point.

i. **Downstream/down-gradient RW samples**: Risk Level 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible and downstream from the effluent discharge point.

j. If two or more discharge locations discharge to the same receiving water, Risk Level 3 dischargers may sample the receiving water at a single upstream and downstream location.

[5] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment-laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment laden water even if most water flowing through the fence is clear.

6. **Risk Level 3 – Visual Observation and Sample Collection Exemptions**

   a. Risk Level 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 3 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

      i. During dangerous weather conditions such as flooding and electrical storms.

      ii. Outside of scheduled site business hours.

   b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 3 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 3 – Storm Water Sample Collection and Handling Instructions**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

   b. Risk Level 3 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

   c. Risk Level 3 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[6]

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[6] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/. QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf

8. **Risk Level 3 – Monitoring Methods**

   a. Risk Level 3 dischargers shall include a description of the following items in the CSMP:

      i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

      ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program an example Chain of Custody form used when handling and shipping samples.

      iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

   b. Risk Level 3 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 3 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). Risk Level 3 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 3 – Analytical Methods**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 3 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

d. **Suspended sediment concentration (SSC)**: Risk Level 3 dischargers that exceed the turbidity Receiving Water Monitoring Trigger shall perform SSC analysis using ASTM Method D3977-97.

e. **Bioassessment**: Risk Level 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

10. **Risk Level 3 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

i. Risk Level 3 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

ii. Risk Level 3 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

iii. Risk Level 3 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 3 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to

reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

i. Risk Level 3 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

ii. Risk Level 3 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

iii. Risk Level 3 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 3 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 3 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 3 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 3 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 3 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 3 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 3 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[7]

h. Risk Level 3 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 3 – Watershed Monitoring Option**

Risk Level 3 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

13. **Risk Level 3 – Particle Size Analysis for Project Risk Justification**

Risk Level 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 3 – Records**

Risk Level 3 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 3 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

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[7] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. **Risk Level 3 – NAL Exceedance Report**

a. Risk Level 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity In this General Permit.

c. Risk Level 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 3 dischargers shall include in the NAL Exceedance Report:

i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit").

ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

16. **Risk Level 3 – Bioassessment**

a. Risk Level 3 dischargers with a total project-related ground disturbance exceeding 30 acres shall:

i. Conduct bioassessment monitoring, as described in Appendix 3.

ii. Include the collection and reporting of specified in stream biological data and physical habitat.

iii. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).[8]

b. Risk Level 3 dischargers qualifying for bioassessment, where construction commences out of an index period for the site location shall:

i. Receive Regional Board approval for the sampling exception.

ii. Conduct bioassessment monitoring, as described in Appendix 3.

iii. Include the collection and reporting of specified instream biological data and physical habitat.

iv. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).

OR

v. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.

[8] http://www.waterboards.ca.gov/water_issues/programs/swamp/.

vi. Send a copy of the check to the Regional Water Board office for the site's region.

vii. Invest $**7,500.00 X The number of samples required** into the SWAMP program as compensation (upon regional board approval).

Table 3 – Risk Level 3 Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level	Numeric Effluent Limitation	Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Risk Level 3 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5	N/A	lower limit = 6.0 upper limit = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 3 Discharges other than ATS	1	NTU	250 NTU	N/A	500 NTU
		For ATS discharges	1	NTU	N/A	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample
SSC	ASTM Method D 3977-97[9]	Risk Level 3 (if Receiving Water Monitoring Trigger exceeded)	5	mg/L	N/A	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[10] fixed-count of 600 org/sample	Risk Level 3 projects> 30 acres	N/A	N/A	N/A	N/A	N/A

[9] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394.

[10] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

ATTACHMENT F:
Active Treatment System (ATS) Requirements

Table 1 – Numeric Effluent Limitations, Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level	Numeric Effluent Limitation
Turbidity	EPA 0180.1 and/or field test with a calibrated portable instrument	For ATS discharges	1	NTU	N/A	10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample

A. Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this Attachment.

B. The discharger shall maintain a paper copy of each ATS specification onsite in compliance with the record retention requirements in the Special Provisions of this General Permit.

C. ATS Design, Operation and Submittals

1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.

2. The discharger shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc[1] during floc pumping or related operations.

3. The discharger shall design outlets to dissipate energy from concentrated flows.

4. The discharger shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction storm

[1] Floc is defined as a clump of solids formed by the chemical action in ATS systems.

water experience or who is a licensed contractors specifically holding a California Class A Contractors license.[2]

5. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:

   a. ATS Operation and Maintenance Manual for All Equipment.

   b. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC).

   c. ATS Health and Safety Plan.

   d. ATS Spill Prevention Plan.

6. The ATS shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

D. Treatment – Chemical Coagulation/Flocculation

1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).

2. The discharger shall conduct, at minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for their ATS.

3. Single field jar tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.

E. Residual Chemical and Toxicity Requirements

1. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold

[2] Business and Professions Code Division 3, Chapter 9, Article 4, Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. [http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp].

concentration[3] (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.

2. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.

3. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.

4. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment[4] mode.

5. A discharger planning to operate in Batch Treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge[5]. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[6]

   b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.

   c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.

   d. The discharger shall electronically report all acute toxicity testing.

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[3] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:
The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.
[4] Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.
[5] This requirement only requires that the test be initiated prior to discharge.
[6] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.

F. Filtration

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.

2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

G. Residuals Management

1. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.

2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

H. ATS Instrumentation

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.

2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:

   a. Influent Turbidity

   b. Effluent Turbidity

   c. Influent pH

   d. Effluent pH

   e. Residual Chemical

   f. Effluent Flow rate

   g. Effluent Flow volume

3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.

4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.

5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.

6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.

7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC plan.

8. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.

9. The instrumentation system shall include a method for controlling coagulant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

I. ATS Effluent Discharge

1. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.

2. NELs for discharges from an ATS:

   a. Turbidity of all ATS discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.

   b. Residual Chemical shall be < 10% of MATC[7] for the most sensitive species of the chemical used.

[7] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

3. If an analytical effluent sampling result exceeds the turbidity NEL (as listed in Table 1), the discharger is in violation of this General Permit and shall electronically file the results in violation within 24-hours of obtaining the results.

4. If ATS effluent is authorized to discharge into a sanitary sewer system, the discharger shall comply with any pre-treatment requirements applicable for that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.

5. Compliance Storm Event:

   Discharges of storm water from ATS shall comply with applicable NELs (above) unless the storm event causing the discharges is determined after the fact to be equal to or larger than the Compliance Storm Event (expressed in inches of rainfall). The Compliance Storm Event for ATS discharges is the 10 year, 24 hour storm, as determined using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca10y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca10y24.gif

   This exemption is dependent on the submission of rain gauge data verifying the storm event is equal to or larger than the Compliance Storm.

J. Operation and Maintenance Plan

1. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.[8]

2. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.

3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems,and other equipment.

K. Sampling and Reporting Quality Assurance/ Quality Check (QA/QC) Plan

4. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:

   a. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.

[8] The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.

b. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.

c. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

L. Personnel Training

1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.

2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.

3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:

   a. Coagulation Basics –Chemistry and physical processes

   b. ATS System Design and Operating Principles

   c. ATS Control Systems

   d. Coagulant Selection – Jar testing, dose determination, etc.

   e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety

   f. Monitoring, Sampling, and Analysis

   g. Reporting and Recordkeeping

   h. Emergency Response

M. Active Treatment System (ATS) Monitoring Requirements

Any discharger who deploys an ATS on their site shall conduct the following:

1. Visual Monitoring

   a. A designated responsible person shall be on site daily at all times during treatment operations.

b. Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.

   i. The log shall include the name and phone number of the person responsible for system operation and monitoring.

   ii. The log shall include documentation of the responsible person's training.

2. Operational and Compliance Monitoring

   a. Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.

   b. Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.

   c. Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.

   d. The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.

   e. Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.

   f. Laboratory duplicates – monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained onsite.

   g. Effluent shall be monitored and recorded for residual chemical/additive levels.

   h. If a residual chemical/additive test does not exist and the ATS is operating in a batch treatment mode of operation refer to the toxicity monitoring requirements below.

3. Toxicity Monitoring

   A discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.[9] All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS)

[9] This requirement only requires that the test be initiated prior to discharge.

Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[10]

b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas or* Rainbow trout *Oncorhynchus mykiss* may be used as a substitute for fathead minnow.

c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.[11]

4. Reporting and Recordkeeping

At a minimum, every 30 days a LRP representing the discharger shall access the State Water Boards Storm Water Mulit-Application and Report Tracking system (SMARTS) and electronically upload field data from the ATS. Records must be kept for three years after the project is completed .

5. Non-compliance Reporting

a. Any indications of toxicity or other violations of water quality objectives shall be reported to the appropriate regulatory agency as required by this General Permit.

b. Upon any measurements that exceed water quality standards, the system operator shall immediately notify his supervisor or other responsible parties, who shall notify the Regional Water Board.

c. If any monitoring data exceeds any applicable NEL in this General Permit, the discharger shall electronically submit a NEL Violation Report to the State Water Board within 24 hours after the NEL exceedance has been identified.

i. ATS dischargers shall certify each NEL Violation Report in accordance with the Special Provisions for Construction Activity in this General Permit.

ii. ATS dischargers shall retain an electronic or paper copy of each NEL Violation Report for a minimum of three years after the date the annual report is filed.

iii. ATS dischargers shall include in the NEL Violation Report:

[10] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.
[11] http://www.epa.gov/waterscience/methods/wet/.

(1) The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

(2) The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and

(3) A description of the current onsite BMPs, and the proposed corrective actions taken to manage the NEL exceedance.

iv. Compliance Storm Exemption - In the event that an applicable NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event, ATS dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification.

Version 8/17/2011

Risk Determination Worksheet

Step 1 Determine Sediment Risk via one of the options listed:

1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map
2. Individual Method - EPA Rainfall Erosivity Calculator & Individual Data

Step 2 Determine Receiving Water Risk via one of the options listed:

1. GIS map of Sediment Sensitive Watersheds provided
2. Site Specific Analysis (support documentation required)

Step 3 Determine Combined Risk Level

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		0
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	0	
16	**Site Sediment Risk Factor**	**Low**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			
21			
22			
23	**GIS Map Method:**		
24	**1.** The R factor for the project is calculated using the online calculator at:		
25	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
26			
27	**2.** The K and LS factors may be obtained by accessing the GIS maps located on the State Water Board FTP website at:		
28	ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/		
29			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml	no	Low
Region 1 Basin Plan Region 2 Basin Plan Region 3 Basin Plan Region 4 Basin Plan Region 5 Basin Plan Region 6 Basin Plan Region 7 Basin Plan Region 8 Basin Plan Region 9 Basin Plan		

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

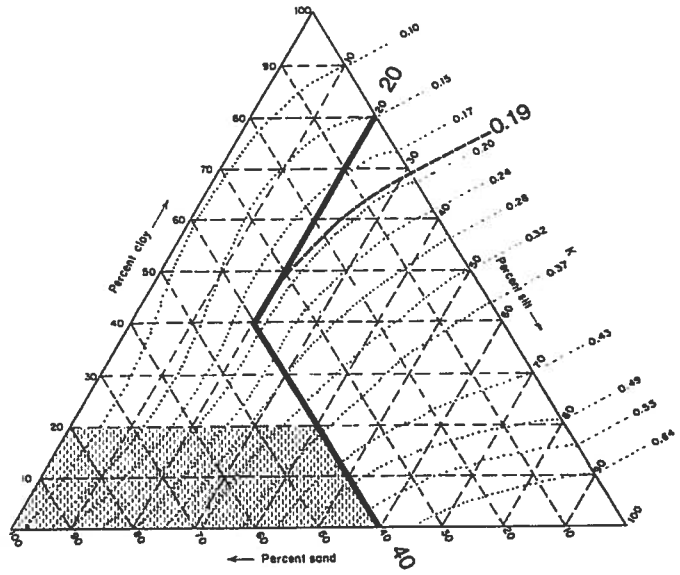
Project Sediment Risk: Low

Project RW Risk: Low

Project Combined Risk: Level 1

Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.



Erickson triangular nomograph used to estimate soil erodibility (K) factor.
The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

Sheet Flow Length (ft)	Average Watershed Slope (%)																		
	0.2	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	30.0	40.0	50.0	60.0
<3	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58	0.63
6	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97	1.07
9	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31	1.47
12	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62	1.84
15	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91	2.19
25	0.05	0.07	0.10	0.16	0.21	0.26	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91	3.36
50	0.05	0.08	0.13	0.21	0.30	0.38	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16	5.97
75	0.05	0.08	0.14	0.25	0.36	0.47	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20	8.37
100	0.05	0.09	0.15	0.28	0.41	0.55	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13	10.63
150	0.05	0.09	0.17	0.33	0.50	0.68	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75	14.89
200	0.06	0.10	0.18	0.37	0.57	0.79	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16	18.92
250	0.06	0.10	0.19	0.40	0.64	0.89	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42	22.78
300	0.06	0.10	0.20	0.43	0.69	0.98	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57	26.51
400	0.06	0.11	0.22	0.48	0.80	1.14	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60	33.67
600	0.06	0.12	0.24	0.56	0.96	1.42	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95	47.18
800	0.06	0.12	0.26	0.63	1.10	1.65	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63	59.93
1000	0.06	0.13	0.27	0.69	1.23	1.86	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84	72.15

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

APPENDIX 2:
Post-Construction Water Balance Performance Standard Spreadsheet

The discharger shall submit with their Notice of Intent (NOI) the following information to demonstrate compliance with the New and Re-Development Water Balance Performance Standard.

Map Instructions

The discharger must submit a small-scale topographic map of the site to show the existing contour elevations, pre- and post-construction drainage divides, and the total length of stream in each watershed area. Recommended scales include 1 in. = 20 ft., 1 in. = 30 ft., 1 in. = 40 ft., or 1 in = 50 ft. The suggested contour interval is usually 1 to 5 feet, depending upon the slope of the terrain. The contour interval may be increased on steep slopes. Other contour intervals and scales may be appropriate given the magnitude of land disturbance.

Spreadsheet Instructions

The intent of the spreadsheet is to help dischargers calculate the project-related increase in runoff volume and select impervious area and runoff reduction credits to reduce the project-related increase in runoff volume to pre-project levels.

The discharger has the option of using the spreadsheet (**Appendix 2.1)** or a more sophisticated, watershed process-based model (e.g. Storm Water Management Model, Hydrological Simulation Program Fortran) to determine the project-related increase in runoff volume.

In* Appendix 4.1**, ***you must complete the worksheet for each land use/soil type combination for each project sub-watershed.

Steps 1 through 9 pertain specifically to the Runoff Volume Calculator:

Step 1: Enter the county where the project is located in cell H3.

Step 2: Enter the soil type in cell H6.

Step 3: Enter the existing pervious (dominant) land use type in cell H7.

Step 4: Enter the proposed pervious (dominant) land use type in cell H8.

Step 5: Enter the total project site area in cell H11 or J11.

Step 6: Enter the sub-watershed area in cell H12 or J12.

Step 7: Enter the existing rooftop area in cell H17 or J17, the existing non-rooftop impervious area in cell H18 or J18, the proposed rooftop area in cell H19 or J19, and the proposed non-rooftop impervious area in cell H20 or J20

Step 8: Work through each of the impervious area reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Step 9: Work through each of the impervious volume reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Non-structural Practices Available for Crediting

- ***Porous Pavement***
- ***Tree Planting***
- ***Downspout Disconnection***
- ***Impervious Area Disconnection***
- ***Green Roof***
- ***Stream Buffer***
- ***Vegetated Swales***
- ***Rain Barrels and Cisterns***
- ***Landscaping Soil Quality***

Post-Construction Water Balance Calculator

User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.		(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below	(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.	SACRAMENTO
			(Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used.	SACRAMENTO FAA ARPT

Project Information		Runoff Calculations		
Project Name:	Optional	(Step 2) Indicate the Soil Type (dropdown menu to right):	Group C Soils	Low Infiltration. Sandy clay loam. Infiltration rate 0.05 to 0.15 inch/hr when wet.
Waste Discharge Identification (WDID):	Optional	(Step 3) Indicate the existingdominant non-built land Use Type (dropdown menu to right):	Wood & Grass: <50% ground cover	
Date:	Optional	(Step 4) Indicate the proposed dominant non-built land Use Type (dropdown menu to right):	Lawn, Grass, or Pasture covering more than 75% of the open space	
Sub Drainage Area Name (from map):	Optional		Complete Either	

Runoff Curve Numbers			Sq Ft	Acres	Acres
Existing Pervious Runoff Curve Number	82	(Step 5) Total Project Site Area:		5.00	5.00
Proposed Development Pervious Runoff Curve Number	74	(Step 6) Sub-watershed Area:		5.00	5.00
		Percent of total project:	100%		

Design Storm				Complete Either		Calculated Acres
Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area.	0.62	in	(Step 7) Sub-watershed Conditions	Sq Ft	Acres	
The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^)	0.44	in	Sub-watershed Area (acres)			5.00
P used for calculations (in) (the greater of the above two criteria)	0.62	in	Existing Rooftop Impervious Coverage		0	0.00
^Available at www.cabmphandbooks.com			Existing Non-Rooftop Impervious Coverage		0	0.00
			Proposed Rooftop Impervious Coverage		0	0.00
			Proposed Non-Rooftop Impervious Coverage		0	0.00

			Credits	Acres	Square Feet
			Porous Pavement	0.00	0
			Tree Planting	0.00	0
Pre-Project Runoff Volume (cu ft)	247	Cu.Ft.	Downspout Disconnection	0.00	0
Project-Related Runoff Volume increase w/o credits (cu ft)	0	Cu.Ft.	Impervious Area Disconnection	0.00	0
			Green Roof	0.00	0
			Stream Buffer	0.00	0
			Vegetated Swales	0.00	0
Project-Related Volume Increase with Credits (cu ft)	0	Cu.Ft.	Subtotal	0.00	0
			Subtotal Runoff Volume Reduction Credit	0 Cu. Ft.	

You have achieved your minimum requirements	(Step 9) Impervious Volume Reduction Credits	Volume (cubic feet)	
	Rain Barrels/Cisterns	0	Cu. Ft.
	Soil Quality	0	Cu. Ft.
	Subtotal Runoff Volume Reduction	0	Cu. Ft.
	Total Runoff Volume Reduction Credit	0	Cu. Ft.

Porous Pavement Credit Worksheet

Please fill out a porous pavement credit worksheet for each project sub-watershed.

For the PROPOSED Development:

Proposed Porous Pavement	Runoff Reduction*	Fill in either Acres or SqFt In SqFt.	In Acres	Equivalent Acres
Area of Brick without Grout on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of Brick without Grout on more than 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of Cobbles less than 12 inches deep and over soil	0.30			0.00
Area of Cobbles less than 12 inches deep and over soil	0.60			0.00
Area of Reinforced Grass Pavement on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of Reinforced Grass Pavement on at least 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of Porous Gravel Pavement on less than 12 inches of base with at least 20% void space over soil	0.38			0.00
Area of Porous Gravel Pavement on at least 12 inches of base with at least 20% void space over soil	0.75			0.00
Area of Poured Porous Concrete or Asphalt Pavement with less than 4 inches of gravel base (washed stone)	0.40			0.00
Area of Poured Porous Concrete or Asphalt Pavement with 4 to 8 inches of gravel base (washed stone)	0.60			0.00
Area of Poured Porous Concrete or Asphalt Pavement with 8 to 12 inches of gravel base (washed stone)	0.80			0.00
Area of Poured Porous Concrete or Asphalt Pavement with 12 or more inches of gravel base (washed stone)	1.00			0.00

*=1-Rv**

Return to Calculator

**Using Site Design Techniques to meet Development Standards for Stormwater Quality (BASMAA 2003)

**NCDENR Stormwater BMP Manual (2007)

Tree Planting Credit Worksheet

Please fill out a tree canopy credit worksheet for each project sub-watershed.

Tree Canopy Credit Criteria	Number of Trees Planted	Credit (acres)
Number of proposed evergreen trees to be planted (credit = number of trees x 0.005)*	0	0.00
Number of proposed deciduous trees to be planted (credit = number of trees x 0.0025)*		0.00
	Square feet Under Canopy	
Square feet under an existing tree canopy, that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is LESS than 12 in diameter.		0.00
Square feet under an existing tree canopy that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is 12 in diameter or GREATER.		0.00
Please describe below how the project will ensure that these trees will be maintained.		

0

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* credit amount based on credits from Stormwater Quality Design Manual for the Sacramento and South Placer Regions

Downspout Disconnection Credit Worksheet

Please fill out a downspout disconnection credit worksheet for each project subwatershed. If you answer yes to all questions, all rooftop area draining to each downspout will be subtracted from your proposed rooftop impervious coverage.

Downspout Disconnection Credit Criteria					
Do downspouts and any extensions extend at least six feet from a basement and two feet from a crawl space or concrete slab?				○ Yes	◉ No
Is the area of rooftop connecting to each disconnected downspout 600 square feet or less?				○ Yes	◉ No
Is the roof runoff from the design storm event fully contained in a raised bed or planter box or does it drain as sheet flow to a landscaped area large enough to contain the roof runoff from the design storm event?				○ Yes	◉ No
The Stream Buffer and/or Vegetated Swale credits **will not** be taken in this sub-watershed area?				○ Yes	◉ No
Percentage of existing	0.00	Acres	of rooftop surface has disconnected downspouts		
Percentage of the proposed	0.00	Acres	of rooftop surface has disconnected downspouts	50	
				Return to Calculator	

Impervious Area Disconnection Credit Worksheet

Please fill out an impervious area disconnection credit worksheet for each project sub-watershed. If you answer yes to all questions, all non-rooftop impervious surface area will be subtracted from your proposed non-rooftop impervious coverage.

Non-Rooftop Disconnection Credit Criteria	Response
Is the maximum contributing impervious flow path length less than 75 feet or, if equal or greater than 75 feet, is a storage device (e.g. French drain, bioretention area, gravel trench) implemented to achieve the required disconnection length?	◉ Yes ○ No
Is the impervious area to any one discharge location less than 5,000 square feet?	◉ Yes ○ No
The Stream Buffer credit **will not** be taken in this sub-watershed area?	◉ Yes ○ No

Percentage of existing	0.00	Acres non-rooftop surface area disconnected	
Percentage of the proposed	0.00	Acres non-rooftop surface area disconnected	70

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Green Roof Credit Worksheet

Please fill out a greenroof credit worksheet for each project sub-watershed. If you answer yes to all questions, 70% of the greenroof area will be subtracted from your proposed rooftop impervious coverage.

Green Roof Credit Criteria	Response
Is the roof slope less than 15% or does it have a grid to hold the substrate in place until it forms a thick vegetation mat?	◉ Yes ○ No
Has a professional engineer assessed the necessary load reserves and designed a roof structure to meet state and local codes?	◉ Yes ○ No
Is the irrigation needed for plant establishment and/or to sustain the green roof during extended dry periods, is the source from stored, recycled, reclaimed, or reused water?	◉ Yes ○ No
Percentage of existing 0.00 Acres rooftop surface area in greenroof	
Percentage of the proposed 0.00 Acres rooftop surface area in greenroof	

Return to Calculator

Stream Buffer Credit Worksheet

Please fill out a stream buffer credit worksheet for each project sub-watershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout and/or Impervious Area Disconnection credits.

Stream Buffer Credit Criteria				Response
Does runoff enter the floodprone width* or within 500 feet (whichever is larger) of a stream channel as sheet flow**?				○ Yes ◉ No
Is the contributing overland slope 5% or less, or if greater than 5%, is a level spreader used?				○ Yes ◉ No
Is the buffer area protected from vehicle or other traffic barriers to reduce compaction?				○ Yes ◉ No
Will the stream buffer be maintained in an ungraded and uncompacted condition and will the vegetation be maintained in a natural condition?				○ Yes ◉ No
Percentage of existing	0.00	Acres	impervious surface area draining into a stream buffer:	
Percentage of the proposed	0.00	Acres	impervious surface area that will drain into a stream buffer:	
Please describe below how the project will ensure that the buffer areas will remain in ungraded and uncompacted condition and that the vegetation will be maintained in a natural condition.				

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* floodprone width is the width at twice the bankfull depth.
** the maximum contributing length shall be 75 feet for impervious area

Vegetated Swale Credit Worksheet

Please fill out a vegetated swale worksheet for each project subwatershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout Disconnection credit.

Vegetated Swale Credit Criteria

Have all vegetated swales been designed in accordance with Treatment Control BMP 30 (TC-30 - Vegetated Swale) from the California Stormwater BMP Handbook, New Development and Redevelopment (available at www.cabmphandbooks.com)?	○ Yes	◉ No
Is the maximum flow velocity for runoff from the design storm event less than or equal to 1.0 foot per second?	○ Yes	◉ No

Percentage of existing	0.00	Acres of impervious area draining to a vegetated swale	
Percentage of the proposed	0.00	Acres of impervious area draining to a vegetated swale	

Return to Calculator

Rain Barrel/Cistern Credit Worksheet

Please fill out a rain barrel/cistern worksheet for each project sub-watershed.

Rain Barrel/Cistern Credit Criteria	Response
Total number of rain barrel(s)/cisterns	
Average capacity of rain barrel(s)/cistern(s) (in gallons)	
Total capacity rain barrel(s)/cistern(s) (in cu ft) [1]	0

[1] accounts for 10% loss

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Please fill out a soil quality worksheet for each project sub-watershed.

	Response
Will the landscaped area be lined with an impervious membrane?	
Will the soils used for landscaping meet the ideal bulk densities listed in Table 1 below? [1]	○ Yes ◉ No
If you answered yes to the question above, and you know the area-weighted bulk density within the top 12 inches for soils used for landscaping (in g/cm^3)* , fill in the cell to the right and skip to cell G11. If not select from the drop-down menu in G10.	1.3
If you answered yes to the question above, but you do not know the exact bulk density, which of the soil types in the drop down menu to the right best describes the top 12 inches for soils used for landscaping (in g/cm^3).	Sandy loams, loams
What is the average depth of your landscaped soil media meeting the above criteria (inches)?	12
What is the total area of the landscaped areas meeting the above criteria (in acres)?	2.97

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Table 1

Sands, loamy sands	<1.6
Sandy loams, loams	<1.4
Sandy clay loams, loams, clay loams	<1.4
Silts, silt loams	<1.3
Silt loams, silty clay loams	<1.1
Sandy clays, silty clays, some clay loams (35-45% clay)	<1.1
Clays (>45% clay)	<1.1

[1] USDA NRCS. "Soil Quality Urban Technical Note No.2-Urban Soil Compaction". March 2000. http://soils.usda.gov/sqi/management/files/sq_utn_2.pdf

* To determine how to calculate density see: http://www.globe.gov/tctg/bulkden.pdf?sectionID=94

Porosity (%) 50.94%

Mineral grains in many soils are mainly quartz and feldspar, so 2.65 a good average for particle density. To determine percent porosity, use the formula: Porosity (%) = (1-Bulk Density/2.65) X 100

APPENDIX 3
Bioassessment Monitoring Guidelines

Bioassessment monitoring is required for projects that meet all of the following criteria:

1. The project is rated Risk Level 3 or LUP Type 3
2. The project directly discharges runoff to a freshwater wadeable stream (or streams) that is either: (a) listed by the State Water Board or USEPA as impaired due to sediment, and/or (b) tributary to any downstream water body that is listed for sediment; and/or have the beneficial use SPAWN & COLD & MIGRATORY
3. Total project-related ground disturbance exceeds 30 acres.

For all such projects, the discharger shall conduct bioassessment monitoring, as described in this section, to assess the effect of the project on the biological integrity of receiving waters.
Bioassessment shall include:

1. The collection and reporting of specified instream biological data
2. The collection and reporting of specified instream physical habitat data

<u>Bioassessment Exception</u>
If a site qualifies for bioassessment, but construction commences out of an index period for the site location, the discharger shall:

1. Receive Regional Water Board approval for the sampling exception
2. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.
3. Send a copy of the check to the Regional Water Board office for the site's region
4. Invest **7,500.00 X The number of samples required** into the SWAMP program as compensation (upon Regional Water Board approval).
5. Conduct bioassessment monitoring, as described in Appendix 4
6. Include the collection and reporting of specified instream biological data and physical habitat
7. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP)

<u>Site Locations and Frequency</u>
Macroinvertebrate samples shall be collected both before ground disturbance is initiated and after the project is completed. The "after" sample(s) shall be collected after at least one winter season resulting in surface runoff has transpired after project-related ground disturbance has ceased. "Before" and "after" samples shall be collected both upstream and downstream of the project's

discharge. Upstream samples should be taken immediately before the sites outfall and downstream samples should be taken immediately after the outfall (when safe to collect the samples). Samples should be collected for each freshwater wadeable stream that is listed as impaired due to sediment, or tributary to a water body that is listed for sediment. Habitat assessment data shall be collected concurrently with all required macroinvertebrate samples.

Index Period (Timing of Sample Collection)
Macroinvertebrate sampling shall be conducted during the time of year (i.e., the "index period") most appropriate for bioassessment sampling, depending on ecoregion. This map is posted on the State Water Board's Website: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml

Field Methods for Macroinvertebrate Collections
In collecting macroinvertebrate samples, the discharger shall use the "Reachwide Benthos (Multi-habitat) Procedure" specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).[1]

Physical - Habitat Assessment Methods
The discharger shall conduct, concurrently with all required macroinvertebrate collections, the "Full" suite of physical habitat characterization measurements as specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007), and as summarized in the Surface Water Ambient Monitoring Program's *Stream Habitat Characterization Form — Full Version.*

Laboratory Methods
Macroinvertebrates shall be identified and classified according to the Standard Taxonomic Effort (STE) Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),[2] and using a fixed-count of 600 organisms per sample.

Quality Assurance
The discharger or its consultant(s) shall have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan shall include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

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[1] This document is available on the Internet at: ~~http://www.swrcb.ca.gov/swamp/docs/phab_sopr6.pdf~~. http://swamp.mpsl.mlml.calstate.edu/wp-content/uploads/2009/04/swamp_sop_bioassessment_collection_020107.pdf.

[2] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: ~~http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf~~ http://www.safit.org/Docs/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

errors are identified). External QA checks shall be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by State Water Board staff.

Sample Preservation and Archiving

The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). The identified organisms shall be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and shall be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms shall be relinquished to the State Water Board upon request by any State Water Board staff.

Data Submittal

The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) shall be submitted to the State Water Board in electronic format. The State Water Board's Surface Water Ambient Monitoring Program (SWAMP) is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available shall be submitted using the SWAMP formats. Until those formats are available, the biological data shall be submitted in MS-Excel (or equivalent) format.[3]

The physical/habitat data shall be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.[4]

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[3] Any version of Excel, 2000 or later, may be used.

[4] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Invasive Species Prevention

In conducting the required bioassessment monitoring, the discharger and its consultants shall take precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the discharger and its consultants shall follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.[5]

[5] Instructions for controlling the spread of NZ mudsnails, including decontamination methods, can be found at: http://www.dfg.ca.gov/invasives/mudsnail/
More information on AIS More information on AIS
http://www.waterboards.ca.gov/water_issues/programs/swamp/ais/

Appendix 4 Non Sediment TMDLs

Region 1 Lost River-DIN and CBOD

Region 1 Source: Cal Trans Construction TMDL Completion Date: 12 30 2008 TMDL Type: River, Lake Watershed Area= 2996 mi^2	**Pollutant Stressors/WLA**	
	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	**Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)**
Lost River from the Oregon border to Tule Lake	.1	.2
Tule Lake Refuge	.1	.2
Lower Klamath Refuge	.1	.2

Region 2 San Francisco Bay-Mercury

Region 2 Source:Non-Urban Stormwater Runoff TMDL Type: Bay	**Name**	**Pollutant Stressor/WLA**	**TMDL Completion Date**
	San Francisco Bay	Mercury 25 kg/year	08 09 2006

Region 4 Ballona Creek-Metals and Selenium

Region 4 Source: NPDES General Construction TMDL Completion Date: 12 22 2005 TMDL Type: Creek	**Pollutant Stressors/WLA**							
	Copper (Cu)		**Lead (Pb)**		**Selenium (Se)**		**Zinc (Zn)**	
	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre
Ballona Creek	4.94E-07 x Daily storm volume (L)	2.20E-10 x Daily storm volume (L)	1.62E-06 x Daily storm volume (L)	7.20E-10 x Daily storm volume (L)	1.37E-07 x Daily storm volume (L)	6.10E-11 x Daily storm volume (L)	3.27E-06 x Daily storm volume (L)	1.45E-09 x Daily storm volume (L)

General Construction Storm Water Permits:
Waste load allocations will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

- Dry-weather Implementation Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order No. 99-08 DWQ), or any successor order, are exempt from the dry-weather waste load allocation equal to zero as long as they comply with the provisions of sections C.3 and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be:
  (1) infeasible to eliminate
  (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and
  (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order.
  Unauthorized non-storm water flows are already prohibited by Order No. 99-08 DWQ.
- Wet-weather Implementation Within seven years of the effective date of the TMDL, the construction industry will submit the results of BMP effectiveness studies to determine BMPs that will achieve compliance with the final waste load allocations assigned to construction storm water permittees.
- Regional Board staff will bring the recommended BMPs before the Regional Board for consideration within eight years of the effective date of the TMDL.
- General construction storm water permittees will be considered in compliance with final waste load allocations if they implement these Regional Board approved BMPs. All permittees must implement the approved BMPs within nine years of the effective date of the TMDL. If no effectiveness studies are conducted and no BMPs are approved by the Regional Board within eight years of the effective date of the TMDL, each general construction storm water permit holder will be subject to site-specific BMPs and monitoring requirements to demonstrate compliance with final waste load allocations.

Region 4 Calleaguas Creek-OC Pesticides, PCBs, and Siltation

Interim Requirements

Region 4 Calleaguas Creek Source: Minor NPDES point sources/WDRs TMDL Completion Date: 3 14 2006 TMDL Type:Creek	**Pollutant Stressor**	**WLA Daily Max (µg/L)**	**WLA Monthly Ave (µg/L)**
	Chlordane	1.2	0.59
	4,4-DDD	1.7	0.84
	4,4-DDE	1.2	0.59
	4,4-DDT	1.2	0.59
	Dieldrin	0.28	0.14
	PCB's	0.34	0.17
	Toxaphene	0.33	0.16

Final WLA (ng/g)							
Region 4 Calleaguas Creek Source: Stormwater Permittees TMDL Completion Date: 3 14 2006 TMDL Type:Creek	Chlordane	4,4-DDD	4,4-DDE	4,4-DDT	Dieldrin	PCB's	Toxaphene
Mugu Lagoon*	3.3	2.0	2.2	0.3	4.3	180.0	360.0
Callegaus Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Revolon Slough (SW)*	0.9	2.0	1.4	0.3	0.1	130.0	1.0
Arroyo Las posas(SW)*	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Arroyo Simi	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Conejo Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Interim Requirements (ng/g)							
Mugu Lagoon*	25.0	69.0	300.0	39.0	19.0	180.	22900.0
Callegaus Creek	17.0	66.0	470.0	110.0	3.0	3800.0	260.0
Revolon Slough (SW)*	48.0	400.0	1600.0	690.0	5.7	7600.0	790.0
Arroyo Las posas(SW)*	3.3	290.0	950.0	670.0	1.1	25700.0	230.0
Arroyo Simi	3.3	14.0	170.0	25.0	1.1	25700.0	230.0
Conejo Creek	3.4	5.3	20.0	2.0	3.0	3800.0	260.0

*(SW)=Subwatershed

*Mugu Lagoon includes Duck pond/Agricultural Drain/Mugu/Oxnard Drain #2

Compliance with sediment based WLAs is measured as an instream annual average at the base of each subwatershed where the discharges are located.

Region 4 Calleguas Creek-Salts

Final Dry Weather Pollutant WLA (mg/L)					
Region 4 Calleaguas Creek Source Permitted Stormwater Dischargers TMDL Completion Date: 12 2 2008 TMDL Type:Creek	**Critical Condition Flow Rate (mgd)**	**Chloride (lb/day)**	**TDS (lb/day)**	**Sulfate (lb/day)**	**Boron (lb/day)**
Simi	1.39	1738.0	9849.0	2897.0	12.0
Las Posas	0.13	157.0	887.0	261.0	N/A
Conejo	1.26	1576.0	8931.0	2627.0	N/A

Camarillo	0.06	72.0	406.0	119.0	N/A
Pleasant Valley (Calleguas)	0.12	150.0	850.0	250.0	N/A
Pleasant Valley (Revolon)	0.25	314.0	1778.0	523.0	2.0

Dry Weather Interim Pollutant WLA (mg/L)				
	Chloride (mg/L)	**TDS (mg/L)**	**Sulfate (mg/L)**	**Boron (mg/L)**
Simi	230.0	1720.0	1289.0	1.3
Las Posas	230.0	1720.0	1289.0	1.3
Conejo	230.0	1720.0	1289.0	1.3
Camarillo	230.0	1720.0	1289.0	1.3
Pleasant Valley (Calleguas)	230.0	1720.0	1289.0	1.3
Pleasant Valley (Revolon)	230.0	1720.0	1289.0	1.3

- General Construction permittees are assigned a dry weather wasteload allocation equal to the average dry weather critical condition flow rate multiplied by the numeric target for each constituent. Waste load allocations apply in the receiving water at the base of each subwatershed. Dry weather allocations apply when instream flow rates are below the 86th percentile flow and there has been no measurable precipitation in the previous 24 hours.
- Because wet weather flows transport a large mass of salts at low concentrations, these dischargers meet water quality objectives during wet weather.
- Interim limits are assigned for dry weather discharges from areas covered by NPDES stormwater permits to allow time to implement appropriate actions. The interim limits are assigned as concentration based receiving water limits set to the 95th percentile of the discharger data as a monthly average limit except for chloride. The 95th percentile for chloride was 267 mg/L which is higher than the recommended criteria set forth in the Basin Plan for protection of sensitive beneficial uses including aquatic life. Therefore, the interim limit for chloride for Permitted Stormwater Dischargers is set equal to 230 mg/L to ensure protection of sensitive beneficial uses in the Calleguas Creek watershed.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Region 4 San Gabriel River and Tributaries Source: Construction Stormwater Dischargers TMDL Completion Date: 3 2007 TMDL Type: Creek	**Pollutant Stressor**	**Wet weather Allocations**	**Dry Weather Allocations**	**% of Watershed**

San Gabriel Reach 2	Lead (Pb)	0.7% * 166 µg/l * Daily Storm Vol	N/A	0.7%
San Gabriel Reach 2	Lead (Pb) Mass based	0.8 kg/d	N/A	0.7%
Coyote Creek	Copper (Cu)	0.285 kg/d	0	5.0%
Coyote Creek	Lead (Pb)	1.70 kg/d	N/A	5.0%
Coyote Creek	Zinc (Zn)	2.4 kg/d	N/A	5.0%
San Jose Creek Reach 1 and 2	Selenium	5 µg/L	5 µg/L	5.0%

Wet-weather allocations for lead in San Gabriel River Reach 2. Concentration-based allocations apply to non-stormwater NPDES discharges. Stormwater allocations are expressed as a percent of load duration curve. Mass-based values presented in table are based on a flow of 260 cfs (daily storm volume = 6.4×10^8 liters).

There are 1555 acres of water in the entire watershed, 37.4 acres of water in the Reach 1 subwatershed (2.4%), and 269 acres in the Coyote Creek subwatershed (17%).

General Construction Storm Water Permits

Waste load allocations for the general construction storm water permits may be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board. An estimate of direct atmospheric deposition is developed based on the percent area of surface water in the watershed. Approximately 0.4% of the watershed area draining to San Gabriel River Reach 2 is comprised of water and approximately 0.2% of the watershed area draining to Coyote Creek is comprised of water.

Region 4 The Harbor Beaches of Ventura County-Bacteria

The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. Bacteriological objectives are set forth in Chapter 3 of the Basin Plan. The objectives are based on four bacteria indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:

The General NPDES Construction permit is seen as a minor contributor and is given no allocation

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Channel Islands Harbor subwatershed are assigned WLAs of zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, individual NPDES permit, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR will also be subject to a WLA of zero (0) days of allowable exceedances.

Region 4 Resolution No. 03-009 Los Angeles River and Tributaries-Nutrients

Minor Point Sources
Waste loads are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia WRP, Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction stormwater, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s)

Region 4 Minor Point Sources for NPDES/WDR Permits TMDL Completion Date: 7 10 2003 TMDL Type: River	Pollutant Stressor/WLA				
	Total Ammonia (NH_3)		**Nitrate-nitrogen (NO_3-N)**	**Nitrite-nitrogen (NO_2-N)**	**NO_3-N + NO_3-N**
	1 Hr Ave mg/l	30 Day Ave mg/l	30 Day Ave mg/l		30 Day Ave mg/l
LA River Above Los Angeles-Glendale WRP (LAG)	4.7	1.6	8.0	1.0	8.0
LA River Below LAG	8.7	2.4	8.0	1.0	8.0
Los Angeles Tributaries	10.1	2.3	8.0	1.0	8.0

Malibu Creek Attachment A to Resolution No. 2004-019R-Bacteria

12 13 2004 The WLAs for permittees under the NPDES General Stormwater Construction Permit are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.

Region 4 Marina del Rey Harbor, Mothers' Beach and Back Basins

Attachment A to Resolution No. 2003-012-Bacteria

8 7 2003 As discussed in "Source Analysis", discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the MdR Watershed will also be subject to a WLA of zero days of allowable exceedances.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Dry Weather Selenium WLA
A zero WLA is assigned to the industrial and construction stormwater permits during dry weather. Non-storm water discharges are already prohibited or restricted by existing general permits.

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day)**		
	Copper (Cu) **Kg/day**	**Lead (Pb)** **Kg/day**	**Zinc (Zn)** **Kg/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 1.24 µg/L	**XXXX**
Coyote Creek and Tributaries	Daily storm volume x 0.7 µg/L	Daily storm volume x 4.3 µg/L	Daily storm volume x 6.2 µg/L

Each enrollee under the general construction stormwater permit receives a WLA on a per acre basis

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day/acre)**		
	Copper (Cu) **Kg/acre/day**	**Lead (Pb)** **Kg/acre/day**	**Zinc (Zn)** **Kg/acre/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 0.56 µg/L	**XXXX**

Coyote Creek and Tributaries	Daily storm volume x 0.12 µg/L	Daily storm volume x 0.70 µg/L	Daily storm volume x 1.01 µg/L

For the general industrial and construction storm water permits, the daily storm volume is measured at USGS station 11085000 for discharges to Reach 2 and above and at LACDPW flow gauge station F354-R for discharges to Coyote Creek.

General construction storm water permits
WLAs will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.
Dry-weather implementation
Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (NPDES Permit No. CAS000002), or any successor permit, are exempt from the dry-weather WLA equal to zero as long as they comply with the provisions of sections C.3.and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be (1) infeasible to eliminate (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order. Unauthorized non-storm water flows are already prohibited by Permit No. CAS000002.

Upon permit issuance, renewal, or re-opener
Non-storm water flows not authorized by Order No. 99-08 DWQ, or any successor order, shall achieve dry-weather WLAs. WLAs shall be expressed as NPDES water quality-based effluent limitations specified in accordance with federal regulations and state policy on water quality control. Effluent limitations may be expressed as permit conditions, such as the installation, maintenance, and monitoring of Regional Board-approved BMPs.

Six years from the effective date of the TMDL
The construction industry will submit the results of wet-weather BMP effectiveness studies to the Los Angeles Regional Board for consideration. In the event that no effectiveness studies are conducted and no BMPs are approved, permittees shall be subject to site-specific BMPs and monitoring to demonstrate BMP effectiveness.

Seven years from the effective date of the TMDL
The Los Angeles Regional Board will consider results of the wet weather BMP effectiveness studies and consider approval of BMPs.

Eight years from the effective date of the TMDL
All general construction storm water permittees shall implement Regional Board-approved BMPs.

Total Maximum Daily Loads (TMDLs) for San Diego Creek,
Upper and Lower Newport Bay, Orange County, California

Region 8 NPDES Construction Permit TMDL Completion Date: 1 24 1995 TMDL Type: River. Cr, Bay	Organochlorine Compounds							
	Total DDT		**Chlordane**		**Total PCBs**		**Toxaphene**	
	g/day	g/yr	g/day	g/yr	g/day	g/yr	g/day	g/yr
San Diego Creek	.27	99.8	**.18***	**64.3***	**.09***	**31.5***	.004	1.5
Upper Newport Bay	.11	40.3	.06	23.4	.06	23.2	X	X
Lower Newport Bay	.04	14.9	.02	8.6	.17	60.7	X	X

*Red= Informational WLA only, not for enforcement purposes

Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by (*the date of OAL approval of this BPA*). ***No later than two months*** from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but ***no later than (three months of completion of the SWPPP Improvement Program)***. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

Appendix 4 Sediment TMDLs

Implemented Sediment TMDLs in California. Construction was listed as a source in all fo these TMDLs in relation to road construction. Although construction was mentioned as a source, it was not given a specific allocation amount. The closest allocation amount would be for the road activity management WLA. **Implementation Phase** – Adoption process by the Regional Board, the State Water Resources Control Board, the Office of Administrative Law, and the US Environmental Protection Agency completed and TMDL being implemented.

A. Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.albionfinaltmdl	R	Albion River	Sedimentation	Road Construction	2001	43 acres	See A (table 6)

B Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelR-middle.mainSed.temp	R	Middle Main Eel River and Tributaries (from Dos Rios to the South Fork)	Sedimentation	Road Construction	2005-2006	521 mi^2	100

C Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelRsouth.sed.temp	R	South Fork Eel River	Sedimentation	Road Construction	12 1999	See chart	473

D Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.bigfinaltmdl	R	Big River	Sedimentation	Road Construction	12 2001	181 mi^2 watershed drainage	TMDL = loading capacity = nonpoint sources + background =

							393 t mi2 yr

E Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelR-lower.Sed.temp-121807-signed	R	Lower Eel River	Sedimentation	Road Construction	12 2007	300 square-mile watershed	898

F Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelR-middle.Sed.temp-	R	Middle Fork Eel River	Sedimentation	Road Construction	12 2003	753 mi^2 (approx. 482,000 acres)	82

G Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi^2	WLA tons mi^2 yr
1 R1.epa.EelRnorth-Sed.temp.final-121807-signed	R	North Fork Eel River	Sedimentation	Road Construction	12 30 2002	289 (180,020 acres)	20

H Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi^2	WLA tons mi^2 yr
1 R1.epa.EelR-upper.mainSed.temp-	R	Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury)	Sedimentation	Road Construction	12 29 2004	688 (approx. 440,384 acres)	14

I Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.gualalafinaltmdl	R	Gualala River	Sedimentation	Road Construction	Not sure	300 (191,145 acres)	7

J Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.Mad-sed.turbidity	R	Mad River	Sedimentation	Road Construction	12 21 2007	480	174

K Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.mattole.sediment	R	Mattole River	Sedimentation	Road Construction	12 30 2003	296	27 or 520+27 = 547

L Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.navarro.sed.temp	R	Navarro River	Sedimentation	Road Construction	Not sure	315 (201,600 acres).	50

M Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.noyo.sediment	R	Noyo River	Sedimentation	Road Construction	12 16 1999	113 (72,323 acres)	68 (three areas measured) Table 16 in the TMDL

APPENDIX 4

N Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.RedwoodCk.sed	Cr	Redwood Creek	Sedimentation	Road Construction	12 30 1998	278	1900 Total allocation

O Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA – Roads tons mi^2 yr
1 R1.epa.tenmile.sed	R	Ten Mile River	Sedimentation	Road Construction	2000	120	9

P Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA management tons mi^2 yr
1 R1.epa.trinity.sed	R	Trinity River	Sedimentation	Road Construction	12 20 2001	2000 of 3000 covered in this TMDL	See rows below
1	Cr	Horse Linto Creek	Sedimentation	Road Construction	12 20 2001	64	528
1	Cr	Mill creek and Tish Tang	Sedimentation	Road Construction	12 20 2001	39	210
1	Cr	Willow Creek	Sedimentation	Road Construction	12 20 2001	43	94
1	Cr	Campbell Creek and Supply Creek	Sedimentation	Road Construction	12 20 2001	11	1961
1	Cr	Lower Mainstem and Coon Creek	Sedimentation	Road Construction	12 20 2001	32	63
1	R	Reference	Sedimentation	Road	12 20 2001	434	24

		Subwatershed [1]		Construction			
1	Cr	Canyon Creek	Sedimentation	Road Construction	12 20 2001	64	326
1	R	Upper Tributaries[2]	Sedimentation	Road Construction	12 20 2001	72	67
1	R	Middle Tributaries[3]	Sedimentation	Road Construction	12 20 2001	54	53
1	R	Lower Tributaries[4]	Sedimentation	Road Construction	12 20 2001	96	55
1	Cr	Weaver and Rush Creeks	Sedimentation	Road Construction	12 20 2001	72	169
1	Cr	Deadwood Creek Hoadley Gulch Poker Bar	Sedimentation	Road Construction	12 20 2001	47	68
1	L	Lewiston Lake	Sedimentation	Road Construction	12 20 2001	25	49
1	Cr	Grassvalley Creek	Sedimentation	Road Construction	12 20 2001	37	44
1	Cr	Indian Creek	Sedimentation	Road Construction	12 20 2001	34	81
1	Cr	Reading and Browns Creek	Sedimentation	Road Construction	12 20 2001	104	66
1	Cr	Reference Subwatersheds[5]	Sedimentation	Road Construction	12 20 2001	235	281
1	L, Cr	Westside tributaries[6]	Sedimentation	Road Construction	12 20 2001	93	105
1	R, Cr, G	Upper trinity[7]	Sedimentation	Road Construction	12 20 2001	161	690
1	R, Cr, G	East Fork Tributaries[8]	Sedimentation	Road Construction	12 20 2001	115	65

1
2
3
4
5
6
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8

1	R, L	Eastside Tributaries[9]	Sedimentation	Road Construction	12 20 2001	89	60

1 New River, Big French, Manzanita, North Fork, East Fork, North Fork
2 Dutch, Soldier, Oregon gulch, Conner Creek
3 Big Bar, Prairie Creek, Little French Creek
4 Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quimby, Hawkins, Sharber
5 Stuarts Fork, Swift Creek, Coffee Creek
6 Stuart Arm, Stoney Creek, Mule Creek, East Fork, Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek,
7 Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstream, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowslide Gulch, Scorpion Creek
8 East Fork Trinity, Cedar Creek, Squirrel Gulch
9 East Side Tributaries, Trinity Lake

Q Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.trinity.so.sed	R, Cr	South Fork Trinity River and Hayfork Creek	Sedimentation	Road Construction	12 1998	Not given, 19 miles long	33 (road total)

R Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.vanduzen.sed	R, Cr	Van Duzen River and Yager Creek	Sedimentation	Various	12 16 1999	429	1353 total allocation
1		Upper Basin	Sedimentation	Road Construction			7
1		Middle Basin	Sedimentation	Road Construction			22
1		Lower Basin	Sedimentation	Road Construction			20

S Region	Type	Name	Pollutant Stressor	Potential	TMDL	Watershed	WLA tons mi^2

[9] 2009-0009-DWQ as amended by 2010-0014-DWQ & 2012-0006-DWQ

				Sources	Completion Date	Acres mi^2	yr
6 R6.blackwood.sed	Cr	Blackwood Creek (Placer County)	Bedded Sediment	Various	9 2007	11	17272 total

T Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
6 R6.SquawCk.sed	R	Squaw Creek (Placer County)	Sedimentation /controllable sources	Various – basin plan amendment	4 13 2006	8.2	10,900

Adopted TMDLs for Construction Sediment Sources

Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Area mi^2	Waste load Allocation tons mi^2 yr
8	R	Newport Bay San Diego Creek Watershed	Sedimentation	Construction Land Development	1999	2.24 (1432 acres)	125,000 tons per Year (no more than 13,000 tons per year from construction sites)

APPENDIX 5:
Glossary

Active Areas of Construction
All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

Active Treatment System (ATS)
A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

Acute Toxicity Test
A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

Air Deposition
Airborne particulates from construction activities.

Approved Signatory
A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;

5. For a public university: an authorized university official;

6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or

7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

Beneficial Uses
As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)
As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)
As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)
The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

Best Management Practices (BMPs)
BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody (COC)
Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Coagulation
The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Common Plan of Development
Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Daily Average Discharge
The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

Debris
Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Direct Discharge
A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

Discharger
The Legally Responsible Person (see definition) or entity subject to this General Permit.

Dose Rate (for ATS)
In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

Drainage Area
The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

Effluent
Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limitation
Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Erosion
The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

Erosion Control BMPs
Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Field Measurements
Testing procedures performed in the field with portable field-testing kits or meters.

Final Stabilization
All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

First Order Stream
Stream with no tributaries.

Flocculants
Substances that interact with suspended particles and bind them together to form flocs.

Good Housekeeping BMPs
BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Grading Phase (part of the Grading and Land Development Phase)
Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Hydromodification
Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

Identified Organisms
Organisms within a sub-sample that is specifically identified and counted.

Inactive Areas of Construction
Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Index Period
The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year,and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

K Factor
The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

Legally Responsible Person
The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.

2. In addition to the above, the following persons or entities may also serve as an LRP:

   a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;

   b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);

   c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or

   d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

Likely Precipitation Event
Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

Maximum Allowable Threshold Concentration (MATC)
The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity

testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

Natural Channel Evolution
The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass though the suite of evolution stages, they will rest in a new state of equilibrium.

Non-Storm Water Discharges
Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Non-Visible Pollutants
Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen though observation (ex: chlorine). Such pollutants being discharged are not authorized.

Numeric Action Level (NAL)
Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

Original Sample Material
The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

pH
Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Post-Construction BMPs
Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)
Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Project

Qualified SWPPP Developer
Individual who is authorized to develop and revise SWPPPs.

Qualified SWPPP Practitioner
Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

Qualifying Rain Event
Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

R Factor
Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

Rain Event Action Plan (REAP)
Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

Remaining Sub sampled Material
The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

Routine Maintenance
Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Runoff Control BMPs
Measures used to divert runon from offsite and runoff within the site.

Run-on
Discharges that originate offsite and flow onto the property of a separate project site.

Revised Universal Soil Loss Equation (RUSLE)
Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

Sampling and Analysis Plan
Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment
Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation
Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs
Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

Settleable Solids (SS)
Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

Sheet Flow
Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

Site

Soil Amendment
Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

Streets and Utilities Phase
Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Structural Controls
Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

Suspended Sediment Concentration (SSC)
The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)
The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Toxicity
The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity
The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Vertical Construction Phase
The Build out of structures from foundations to roofing, including rough landscaping.

Waters of the United States
Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.[1]

Water Quality Objectives (WQO)
Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

[1] The application of the definition of "waters of the United States" may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

APPENDIX 6:
Acronym List

ASBS	Areas of Special Biological Significance
ASTM	American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils
ATS	Active Treatment System
BASMAA	Bay Area Storm water Management Agencies Association
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
CAFO	Confined Animal Feeding Operation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CIWQS	California Integrated Water Quality System
CKD	Cement Kiln Dust
COC	Chain of Custody
CPESC	Certified Professional in Erosion and Sediment Control
CPSWQ	Certified Professional in Storm Water Quality
CSMP	Construction Site Monitoring Program
CTB	Cement Treated Base
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
CWP	Center for Watershed Protection
DADMAC	Diallyldimethyl-ammonium chloride
DDNR	Delaware Department of Natural Resources
DFG	Department of Fish and Game
DHS	Department of Health Services
DWQ	Division of Water Quality
EC	Electrical Conductivity
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
HSPF	Hydrologic Simulation Program Fortran
JTU	Jackson Turbidity Units
LID	Low Impact Development
LOEC	Lowest Observed Effect Concentration
LRP	Legally Responsible Person
LUP	Linear Underground/Overhead Projects

MATC	Maximum Allowable Threshold Concentration
MDL	Method Detection Limits
MRR	Monitoring and Reporting Requirements
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NICET	National Institute for Certification in Engineering Technologies
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
PAC	Polyaluminum chloride
PAM	Polyacrylamide
PASS	Polyaluminum chloride Silica/sulfate
POC	Pollutants of Concern
PoP	Probability of Precipitation
POTW	Publicly Owned Treatment Works
PRDs	Permit Registration Documents
PWS	Planning Watershed
QAMP	Quality Assurance Management Plan
QA/QC	Quality Assurance/Quality Control
REAP	Rain Event Action Plan
Regional Board	Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RUSLE	Revised Universal Soil Loss Equation
RW	Receiving Water
SMARTS	Storm water Multi Application Reporting and Tracking System
SS	Settleable Solids
SSC	Suspended Sediment Concentration
SUSMP	Standard Urban Storm Water Mitigation Plan
SW	Storm Water
SWARM	Storm Water Annual Report Module
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TC	Treatment Control
TDS	Total Dissolved Solids

TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDID	Waste Discharge Identification Number
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation
WET	Whole Effluent Toxicity
WRCC	Western Regional Climate Center
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard

APPENDIX 7:
State and Regional Water Resources Control Board Contacts

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640

CENTRAL VALLEY REGION (5S)
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670-6114
(916) 464-3291 FAX: (916) 464-4645

FRESNO BRANCH OFFICE (5F)
1685 E St.
Fresno, CA 93706
(559) 445-5116 FAX: (559) 445-5910

REDDING BRANCH OFFICE (5R)
364 Knollcrest Drive, Ste. 205
Redding, CA 96002
(530) 224-4845 FAX: (530) 224-4857

LAHONTAN REGION (6 SLT)
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400 FAX: (530) 544-2271

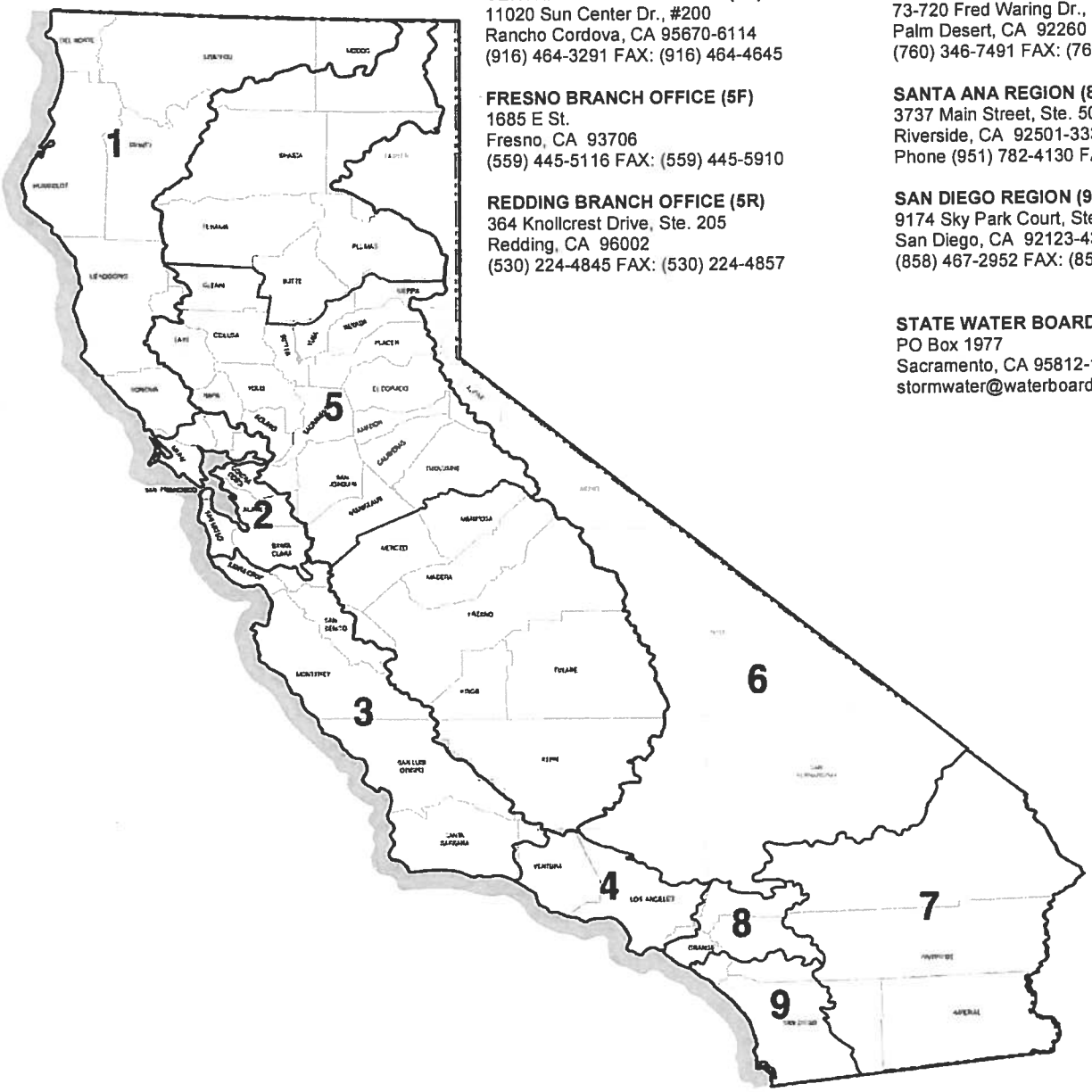
VICTORVILLE OFFICE (6V)
14440 Civic Drive, Ste. 200
Victorville, CA 92392-2383
(760) 241-6583 FAX: (760) 241-7308

COLORADO RIVER BASIN REGION (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491 FAX: (760) 341-6820

SANTA ANA REGION (8)
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
Phone (951) 782-4130 FAX: (951) 781-6288

SAN DIEGO REGION (9)
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340
(858) 467-2952 FAX: (858) 571-6972

STATE WATER BOARD
PO Box 1977
Sacramento, CA 95812-1977
stormwater@waterboards.ca.gov



XIII. POST-CONSTRUCTION STANDARDS

A. All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.

1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.

2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.

3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.

4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream[14] or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

[14] A first order stream is defined as a stream with no tributaries.

B. All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

XIV. SWPPP REQUIREMENTS

A. The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;

2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;

3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;

4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and

5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.

B. To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.

C. The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

XV. REGIONAL WATER BOARD AUTHORITIES

A. In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.

B. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

C. Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

D. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

E. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

XVI. ANNUAL REPORTING REQUIREMENTS

A. All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.

B. The discharger shall certify each Annual Report in accordance with the Special Provisions.

C. The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.

D. The discharger shall include storm water monitoring information in the Annual Report consisting of:

1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;

2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

3. a summary of all corrective actions taken during the compliance year;

4. identification of any compliance activities or corrective actions that were not implemented;

5. a summary of all violations of the General Permit;

6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;

7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and

8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.

E. The discharger shall provide training information in the Annual Report consisting of:

1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and

3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

ATTACHMENT A
Linear Underground/ Overhead Requirements

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All Linear Underground/Overhead project dischargers who submit permit registration documents (PRDs) indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. LUP evaluation shall consist of two tasks:

a. Confirm that the project or project section(s) qualifies as an LUP. The State Water Board website contains a project determination guidance flowchart. http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

b. Identify which Type(s) (1, 2 or 3 described in Section I below) are applicable to the project or project sections based on project sediment and receiving water risk. (See Attachment A.1)

3. A Legally Responsible Person (LRP) for a Linear Underground/Overhead project is required to obtain CGP coverage under one or more permit registration document (PRD) electronic submittals to the State Water Board's Storm Water Multi-Application and Report Tracking (SMARTs) system. Attachment A.1 contains a flow chart to be used when determining if a linear project qualifies for coverage and to determine LUP Types. Since a LUP may be constructed within both developed and undeveloped locations and portions of LUPs may be constructed by different contractors, LUPs may be broken into logical permit sections. Sections may be determined based on portions of a project conducted by one contractor. Other situations may also occur, such as the time period in which the sections of a project will be constructed (e.g. project phases), for which separate permit coverage is possible. For projects that are broken into separate sections, a description of how each section relates to the overall project and the definition of the boundaries between sections shall be clearly stated.

4. Where construction activities transverse or enter into different Regional Water Board jurisdictions, LRPs shall obtain permit coverage for each Regional Water Board area involved prior to the commencement of construction activities.

5. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small linear construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs)

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted. PRDs shall consist of the following:

1. Notice of Intent (NOI)

Prior to construction activities, the LRP of a proposed linear underground/overhead project shall utilize the processes and methods provided in Attachment A.2, Permit Registration Documents (PRDs) – General Instructions for Linear Underground/Overhead Projects to comply with the Construction General Permit.

2. Site Maps

LRPs submitting PRDs shall include at least 3 maps. The first map will be a zoomed[1] 1000-1500 ft vicinity map that shows the starting point of the project. The second will be a zoomed map of 1000-1500 ft showing the ending location of the project. The third will be a larger view vicinity map, 1000 ft to 2000 ft, displaying the entire project location depending on the project size, and indicating the LUP type (1, 2 or 3) areas within the total project footprint.

3. Drawings

LRPs submitting PRDs shall include a construction drawing(s) or other appropriate drawing(s) or map(s) that shows the locations of storm drain

[1] An image with a close-up/enhanced detailed view of site features that show minute details such as streets and neighboring structures.
Or: An image with a close-up/enhanced detailed view of the site's surrounding infrastructure.
Or: An image with a close up detailed view of the project and its surroundings.

inlets and waterbodies[2] that may receive discharges from the construction activities and that shows the locations of BMPs to be installed for all those BMPs that can be illustrated on the revisable drawing(s) or map(s). If storm drain inlets, waterbodies, and/or BMPs cannot be adequately shown on the drawing(s) or map(s) they should be described in detail within the SWPPP.

4. **Storm Water Pollution Prevention Plan (SWPPP)**

   LUP dischargers shall comply with the SWPPP Preparation, Implementation, and Oversight requirements in Section K of this Attachment.

5. **Contact information**

   LUP dischargers shall include contact information for all contractors (or subcontractors) responsible for each area of an LUP project. This should include the names, telephone numbers, and addresses of contact personnel. Specific areas of responsibility of each contact, and emergency contact numbers should also be included.

6. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. LINEAR PROJECT TERMINATION OF COVERAGE REQUIREMENTS

The LRP may terminate coverage of an LUP when construction activities are completed by submitting an electronic notice of termination (NOT) through the State Water Board's SMARTS system. Termination requirements are different depending on the complexity of the LUP. An LUP is considered complete when: (a) there is no potential for construction-related storm water pollution; (b) all elements of the SWPPP have been completed; (c) construction materials and waste have been disposed of properly; (d) the site is in compliance with all local storm water management requirements; and (e) the LRP submits a notice of termination (NOT) and has received approval for termination from the appropriate Regional Water Board office.

1. **LUP Stabilization Requirements**

   The LUP discharger shall ensure that all disturbed areas of the construction site are stabilized prior to termination of coverage under this General Permit. Final stabilization for the purposes of submitting an NOT

[2] Includes basin(s) that the MS4 storm sewer systems may drain to for Hydromodification or Hydrological Conditional of Concerns under the MS4 permits.

is satisfied when all soil disturbing activities are completed and one of the following criteria is met:

a. In disturbed areas that were vegetated prior to construction activities of the LUP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions. Where preconstruction vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: if the preconstruction vegetation covers 50 percent of the ground surface, 70 percent of 50 percent (.70 X .50=.35) would require 35 percent total uniform surface coverage; or

b. Where no vegetation is present prior to construction, the site is returned to its original line and grade and/or compacted to achieve stabilization; or

c. Equivalent stabilization measures have been employed. These measures include, but are not limited to, the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

2. LUP Termination of Coverage Requirements

The LRP shall file an NOT through the State Water Board's SMARTS system. By submitting an NOT, the LRP is certifying that construction activities for an LUP are complete and that the project is in full compliance with requirements of this General Permit and that it is now compliant with soil stabilization requirements where appropriate. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated.

3. Revising Coverage for Change of Acreage

When the LRP of a portion of an LUP construction project changes, or when a phase within a multi-phase project is completed, the LRP may reduce the total acreage covered by this General Permit. In reducing the acreage covered by this General Permit, the LRP shall electronically file revisions to the PRDs that include:

a. a revised NOI indicating the new project size;

b. a revised site map showing the acreage of the project completed, acreage currently under construction, acreage sold, transferred or added, and acreage currently stabilized.

c. SWPPP revisions, as appropriate; and

d. certification that any new LRPs have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address (if known) of the new LRP.

If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

D. DISCHARGE PROHIBITIONS

1. LUP dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

2. LUP dischargers are prohibited from discharging non-storm water that is not otherwise authorized by this General Permit. Non-storm water discharges authorized by this General Permit[3] may include, fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, street cleaning, dewatering,[4] uncontaminated groundwater from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials on site. These authorized non-storm water discharges:

[3] Dischargers must identify all authorized non-storm water discharges in the LUP's SWPPP and identify BMPs that will be implemented to either eliminate or reduce pollutants in non-storm water discharges. Regional Water Boards may direct the discharger to discontinue discharging such non-storm water discharges if determined that such discharges discharge significant pollutants or threaten water quality.
[4] Dewatering activities may be prohibited or need coverage under a separate permit issued by the Regional Water Boards. Dischargers shall check with the appropriate Regional Water Boards for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

a. Shall not cause or contribute to a violation of any water quality standard;

b. Shall not violate any other provision of this General Permit;

c. Shall not violate any applicable Basin Plan;

d. Shall comply with BMPs as described in the SWPPP;

e. Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;

f. Shall be monitored and meets the applicable NALs; and

g. Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by this General Permit to determine the need for a separate NPDES permit.

Additionally, some LUP dischargers may be required to obtain a separate permit if the applicable Regional Water Board has adopted a General Permit for dewatering discharges. Wherever feasible, alternatives, that do not result in the discharge of non-storm water, shall be implemented in accordance with this Attachment's Section K.2 - SWPPP Implementation Schedule.

3. LUP dischargers shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated[5] are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to an NPDES permit.

When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LUP discharger shall have those soils sampled and tested to ensure that proper handling and public safety measures are

[5] Contaminated soil contains pollutants in concentrations that exceed the appropriate thresholds that various regulatory agencies set for those substances. Preliminary testing of potentially contaminated soils will be based on odor, soil discoloration, or prior history of the site's chemical use and storage and other similar factors. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The legally responsible person will notify the appropriate local, State, or federal agency(ies) when contaminated soil is found at a construction site, and will notify the Regional Water Board by submitting an NOT at the completion of the project.

implemented. The LUP discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

4. Discharging any pollutant-laden water that will cause or contribute to an exceedance of the applicable Regional Water Board's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain is prohibited.

5. Debris[6] resulting from construction activities are prohibited from being discharged from construction project sites.

E. SPECIAL PROVISIONS

1. Duty to Comply

a. The LUP discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

b. The LUP discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

a. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

[6] Litter, rubble, discarded refuse, and remains of something destroyed.

b. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an LUP discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4. Duty to Mitigate

The LUP discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The LUP discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of the Storm Water Pollution Prevention Plan (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Maintain Records and Provide Information

a. The LUP discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be kept at the construction site or in a crew

member's vehicle until construction is completed, and shall be made available upon request.

b. The LUP discharger shall furnish the Regional Water Board, State Water Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The LUP discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

8. Inspection and Entry

The LUP discharger shall allow the Regional Water Board, State Water Board, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Electronic Signature and Certification Requirements

a. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

b. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or

together with any reports, information or applications to be signed by an Approved Signatory.

c. All SWPPP revisions, annual reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, USEPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

10. Certification

Any person signing documents under Section E.9 above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Anticipated Noncompliance

The LUP discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the LUP discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[7] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

17. Transfers

This General Permit is not transferable. A new LRP of an ongoing construction activity must submit PRDs in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An LRP who is a property owner with active General Permit coverage who sells a fraction or all the land shall inform the new property owner(s) of the requirements of this General Permit.

18. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those

[7] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act

dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

F. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

1. Narrative Effluent Limitations

a. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges regulated by this General Permit do not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

b. LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of structural or non-structural controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1. Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	LUP Type 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		LUP Type 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	LUP Type 2	1	NTU	250 NTU
		LUP Type 3			250 NTU

2. Numeric Action Levels (NALs)

a. For LUP Type 2 and 3 dischargers, the lower storm event daily average NAL for pH is 6.5 pH units and the upper storm event daily average NAL for pH is 8.5 pH units. The LUP discharger shall take actions as described below if the storm event daily average discharge is outside of this range of pH values.

b. For LUP Type 2 and 3 dischargers, the storm event daily average NAL for turbidity is 250 NTU. The discharger shall take actions as described below if the storm event daily average discharge is outside of this range of turbidity values.

c. Whenever daily average analytical effluent monitoring results indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the LUP discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

d. The site evaluation will be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

i Are related to the construction activities and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

AND/OR:

ii Are related to the run-on associated with the construction site location and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) decide what corrective action(s) were taken or will be taken, including a description of the schedule for completion.

3. Receiving Water Monitoring Triggers

a. The receiving water monitoring triggers for LUP Type 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[8] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

b. LUP Type 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this General Permit.

c. LUP Type 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

d. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

G. RECEIVING WATER LIMITATIONS

1. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

2. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

3. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or

[8] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

H. TRAINING QUALIFICATIONS

1. General

All persons responsible for implementing requirements of this General Permit shall be appropriately trained. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Persons responsible for preparing, amending and certifying SWPPPs shall comply with the requirements in this Section H.

2. SWPPP Certification Requirements

a. **Qualified SWPPP Developer:** The LUP discharger shall ensure that all SWPPPs be written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

i A California registered professional civil engineer;

ii A California registered professional geologist or engineering geologist;

iii A California registered landscape architect;

iv A professional hydrologist registered through the American Institute of Hydrology;

v A certified professional in erosion and sediment control (CPESC) ™ registered through Enviro Cert International, Inc;

vi A certified professional in storm water quality (CPSWQ)™ registered through Enviro Cert International, Inc.; or

vii A certified professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

b. The LUP discharger shall ensure that the SWPPP is written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage.

c. The LUP discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

d. **Qualified SWPPP Practitioner:** The LUP discharger shall ensure that all elements of any SWPPP for each project will be implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis, and for ensuring full compliance with the permit and implementation of all elements of the SWPPP. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   i A certified erosion, sediment and storm water inspector registered through Certified Professional in Erosion and Sediment Control, Inc.; or

   ii A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

e. The LUP discharger shall ensure that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner, and who is ultimately responsible for implementation of the SWPPP. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

f. The LUP discharger shall ensure that the SWPPP and each amendment be signed by the Qualified SWPPP Developer. The LUP discharger shall include a listing of the date of initial preparation and the dates of each amendment in the SWPPP.

I. TYPES OF LINEAR PROJECTS

This attachment establishes three types (Type 1, 2 & 3) of complexity for areas within an LUP or project section based on threat to water quality. Project area Types are determined through Attachment A.1.

The Type 1 requirements below establish the baseline requirements for all LUPs subject to this General Permit. Additional requirements for Type 2 and Type 3 LUPs are labeled.

1. Type 1 LUPs:

LUP dischargers with areas of a LUP designated as Type 1 shall comply with the requirements in this Attachment. Type 1 LUPs are:

a. Those construction areas where 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day; or

b. Where greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

   i Areas disturbed during construction will be returned to preconstruction conditions or equivalent protection is established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

   ii Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization BMPs will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

c. Where the risk determination is as follows:

   i Low sediment risk, low receiving water risk, or

   ii Low sediment risk, medium receiving water risk, or

   iii Medium sediment risk, low receiving water risk

2. **Type 2 LUPs**:

Type 2 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 2 LUPs have the specified combination of risk:

d. High sediment risk, low receiving water risk, or

e. Medium sediment risk, medium receiving water risk, or

f. Low sediment risk, high receiving water risk

Receiving water risk is either considered "Low" for those areas of the project that are not in close proximity to a sensitive receiving watershed, "Medium" for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, and "High" where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C of this General Permit.

3. **Type 3 LUPs:**

Type 3 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 3 LUPs have the specified combination of risk:

a. High sediment risk, high receiving water risk, or

b. High sediment risk, medium receiving water risk, or

c. Medium sediment risk, high receiving water risk

Receiving water risk is either considered "Medium" for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, or "High" where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C.

J. LUP TYPE-SPECIFIC REQUIREMENTS

1. Effluent Standards

a. Narrative – LUP dischargers shall comply with the narrative effluent standards below.

i Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

ii LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

b. Numeric – LUP Type 1 dischargers are not subject to a numeric effluent standard

c. Numeric –LUP Type 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

d. Numeric – LUP Type 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

2. Good Site Management "Housekeeping"

a. LUP dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:

i Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

ii Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

iii Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

iv Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).

v Implement BMPs to control the off-site tracking of loose construction and landscape materials.

b. LUP dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

i Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

ii Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

iii Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

iv Cover waste disposal containers at the end of every business day and during a rain event.

v Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

vi Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

vii Implement procedures that effectively address hazardous and non-hazardous spills.

viii Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

(1) Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

(2) Appropriate spill response personnel are assigned and trained.

ix Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

c. LUP dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   i Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.

   ii Implement appropriate BMPs whenever equipment or vehicles are fueled, maintained or stored.

   iii Clean leaks immediately and disposing of leaked materials properly.

d. LUP dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   i Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   ii Contain fertilizers and other landscape materials when they are not actively being used.

   iii Discontinue the application of any erodible landscape material at least 2 days before a forecasted rain event[9] or during periods of precipitation.

   iv Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   v Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

e. LUP dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, LUP dischargers shall do the following:

[9] 50% or greater chance of producing precipitation.

i Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

ii Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

iii Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

iv Ensure retention of sampling, visual observation, and inspection records.

v Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

f. LUP dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

3. Non-Storm Water Management

a. LUP dischargers shall implement measures to control all non-storm water discharges during construction.

b. LUP dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

c. LUP dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

4. Erosion Control

a. LUP dischargers shall implement effective wind erosion control.

b. LUP dischargers shall provide effective soil cover for inactive[10] areas and all finished slopes, and utility backfill.

[10] Areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days

c. LUP dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

5. Sediment Controls

a. LUP dischargers shall establish and maintain effective perimeter controls as needed, and implement effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

b. On sites where sediment basins are to be used, LUP dischargers shall, at minimum, design sediment basins according to the guidance provided in CASQA's Construction BMP Handbook.

c. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[11] in accordance with Table 2 below.

Table 2 – Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

d. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.

e. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

f. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall inspect all immediate access roads. At a minimum daily and prior to any rain event, the discharger shall remove any

[11] Sheet flow length is the length that shallow, low velocity flow travels across a site.

sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

g. **Additional LUP Type 3 Requirement:** The Regional Water Board may require LUP Type 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

6. **Run-on and Run-off Controls**

a. LUP dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site-shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this Attachment.

b. Run-on and runoff controls are not required for Type 1 LUPs unless the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires such controls.

7. **Inspection, Maintenance and Repair**

a. All inspection, maintenance repair and sampling activities at the discharger's LUP location shall be performed or supervised by a QSP representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

b. LUP dischargers shall conduct visual inspections and observations daily during working hours (not recorded). At least once each 24-hour period during extended storm events, **LUP Type 2 & 3 dischargers** shall conduct visual inspections to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

c. Upon identifying failures or other shortcomings, as directed by the QSP, LUP dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

d. For each pre- and post-rain event inspection required, LUP dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format that includes the information described below.

e. The LUP discharger shall ensure that the checklist remains on-site or with the SWPPP. At a minimum, an inspection checklist should include:

i Inspection date and date the inspection report was written.

ii Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

iii Site information, including stage of construction, activities completed, and approximate area of the site exposed.

iv A description of any BMPs evaluated and any deficiencies noted.

v If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

vi Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

vii Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

viii Photographs taken during the inspection, if any.

ix Inspector's name, title, and signature.

K. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

1. Objectives

SWPPPs for all LUPs shall be developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

a. All pollutants and their sources, including sources of sediment, associated with construction activities associated with LUP activity are controlled;

b. All non-storm water discharges are identified and either eliminated, controlled, or treated;

c. BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from LUPs during construction; and

d. Stabilization BMPs installed to reduce or eliminate pollutants after construction is completed are effective and maintained.

2. SWPPP Implementation Schedule

a. LUPs for which PRDs have been submitted to the State Water Board shall develop a site/project location SWPPP prior to the start of land-disturbing activity in accordance with this Section and shall implement the SWPPP concurrently with commencement of soil-disturbing activities.

b. For an ongoing LUP involving a change in the LRP, the new LRP shall review the existing SWPPP and amend it, if necessary, or develop a new SWPPP within 15 calendar days to conform to the requirements set forth in this General Permit.

3. Availability

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

L. REGIONAL WATER BOARD AUTHORITIES

1. Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing monitoring and sampling and analysis reports, conducting compliance inspections, gathering site information by any medium including sampling, photo and video documentation, and taking enforcement actions.

2. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

3. Regional Water Boards may issue separate permits for discharges of storm water associated with construction activity to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a Regional Water Board, dischargers subject to those permits shall no longer be regulated by this General Permit.

4. Regional Water Boards may direct the discharger to reevaluate the LUP Type(s) for the project (or elements/areas of the project) and impose the appropriate level of requirements.

5. Regional Water Boards may terminate coverage under this General Permit for dischargers who negligently or with willful intent incorrectly determine or report their LUP Type (e.g., they determine themselves to be a LUP Type 1 when they are actually a Type 2).

6. Regional Water Boards may review PRDs and reject or accept applications for permit coverage or may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

7. Regional Water Boards may impose additional requirements on dischargers to satisfy TMDL implementation requirements or to satisfy provisions in their Basin Plans.

8. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

9. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

10. Based on an LUP's threat to water quality and complexity, the Regional Water Board may determine on a case-by-case basis that an LUP, or a portion of an LUP, is not eligible for the linear project requirements contained in this Attachment, and require that the discharger comply with all standard requirements in this General Permit.

11. The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

M. MONITORING AND REPORTING REQUIREMENTS

Table 3. LUP Summary of Monitoring Requirements

LUP Type	Visual Inspections				Sample Collection		
	Daily Site BMP	Pre-storm Event Baseline	Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water	Non-Visible (when applicable)
1	X						X
2	X	X	X	X	X		X
3	X	X	X	X	X	X	X

1. Objectives

LUP dischargers shall prepare a monitoring and reporting program (M&RP) prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The M&RP must be a part of the SWPPP, included as an appendix or separate SWPPP chapter.

2. M&RP Implementation Schedule

a. LUP dischargers shall implement the requirements of this Section at the time of commencement of construction activity. LUP dischargers are responsible for implementing these requirements until construction activity is complete and the site is stabilized.

b. LUP dischargers shall revise the M&RP when:

i Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements and intent of this General Permit.

ii The Regional Water Board requires the discharger to revise its M&RP based on its review of the document. Revisions may include, but not be limited to, conducting additional site inspections, submitting reports, and certifications. Revisions shall be submitted via postal mail or electronic e-mail.

iii The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

3. LUP Type 1 Monitoring and Reporting Requirements

a. LUP Type 1 Inspection Requirements

i LUP Type 1 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 1 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 1 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 1 dischargers shall conduct daily visual inspections to verify that:

(1) Appropriate BMPs for storm water and non-storm water are being implemented in areas where active construction is occurring (including staging areas);

(2) Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day;

(3) Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.

v Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures

are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vi Inspection programs are required for LUP Type 1 projects where temporary and permanent stabilization BMPs are installed and are to be monitored after active construction is completed. Inspection activities shall continue until adequate permanent stabilization is established and, in areas where re-vegetation is chosen, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

b. LUP Type 1 Monitoring Requirements for Non-Visible Pollutants

LUP Type 1 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where the LUP Type 1 discharger believes pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help the LUP Type 1 discharger determine when to collect samples.

(2) The LUP Type 1 discharger is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 1 dischargers shall collect samples down-gradient from all discharge locations where the visual observations were made triggering the monitoring, and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 1 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 1 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[12]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 1 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 1 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

c. <u>LUP Type 1 Visual Observation Exceptions</u>

i LUP Type 1 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. The Type 1 LUP discharger is not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

[12] Sample collected at a location unaffected by contruction activities.

ii If the LUP Type 1 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

d. Particle Size Analysis for Risk Justification

LUP Type 1 dischargers utilizing justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

4. LUP Type 2 & 3 Monitoring and Reporting Requirements

a. LUP Type 2 & 3 Inspection Requirements

i LUP Type 2 & 3 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 2 & 3 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 2 & 3 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 2 & 3 dischargers shall conduct daily visual inspections to verify that appropriate BMPs for storm water and non-storm water are being implemented and in place in areas where active construction is occurring (including staging areas).

v LUP Type 2 & 3 dischargers shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that BMPs have functioned adequately. During

extended storm events, inspections shall be required during normal working hours for each 24-hour period.

vi Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vii LUP Type 2 & 3 dischargers shall implement a monitoring program for inspecting projects that require temporary and permanent stabilization BMPs after active construction is complete. Inspections shall ensure that the BMPs are adequate and maintained. Inspection activities shall continue until adequate permanent stabilization is established and, in vegetated areas, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

viii If possible, LUP Type 2 & 3 dischargers shall install a rain gauge on-site at an accessible and secure location with readings made during all storm event inspections. When readings are unavailable, data from the closest rain gauge with publically available data may be used.

ix LUP Type 2 & 3 dischargers shall Include and maintain a log of the inspections conducted in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection.

b. LUP Type 2 & 3 Storm Water Effluent Monitoring Requirements

Table 4. LUP Type 2 & 3 Effluent Monitoring Requirements

LUP Type	Frequency	Effluent Monitoring
2	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	Turbidity, pH, and non-visible pollutant parameters (if applicable)
3	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	turbidity, pH, and non-visible pollutant parameters (if applicable)

i LUP Type 2 & 3 dischargers shall collect storm water grab samples from sampling locations characterizing discharges associated with activity from the LUP active areas of construction. At a minimum, 3 samples shall be collected per day of discharge.

ii LUP Type 2 & 3 dischargers shall collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

iii LUP Type 2 & 3 dischargers shall ensure that storm water grab sample(s) obtained be representative of the flow and characteristics of the discharge.

iv LUP Type 2 & 3 dischargers shall analyze their effluent samples for:

(1) pH and turbidity
(2) Any additional parameter for which monitoring is required by the Regional Water Board.

c. <u>LUP Type 2 & 3 Storm Water Effluent Sampling Locations</u>

i LUP Type 2 & 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire disturbed project or area.

ii LUP Type 2 & 3 dischargers may monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of NALs.

iii LUP Type 2 & 3 dischargers shall select analytical test methods from the list provided in Table 5 below.

iv LUP Type 2 & 3 dischargers shall ensure that all storm water sample collection preservation and handling shall be conducted in accordance with the "Storm Water Sample Collection and Handling Instructions" below.

d. <u>LUP Type 3 Receiving Water Monitoring Requirements</u>

i In the event that an LUP Type 3 discharger's effluent exceeds the receiving water monitoring triggers of 500 NTU turbidity or pH range of 6.0-9.0, contained in this General Permit and has a direct discharge to receiving waters, the LUP discharger shall subsequently sample Receiving Waters (RWs) for turbidity, pH (if applicable) and SSC for the duration of coverage under this General Permit. In the event that an LUP Tupe 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall

subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

ii LUP Type 3 dischargers that meet the project criteria in Appendix 3 of this General Permit and have more than 30 acres of soil disturbance in the project area or project section area designated as Type 3, shall comply with the Bioassessment requirements prior to commencement of construction activity.

iii LUP Type 3 dischargers shall obtain RW samples in accordance with the requirements of the Receiving Water Sampling Locations section (Section M.4.c. of this Attachment).

e. LUP Type 3 Receiving Water Sampling Locations

i **Upstream/up-gradient RW samples**: LUP Type 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible to and upstream from the effluent discharge point.

ii **Downstream/down-gradient RW samples**: LUP Type 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible to and downstream from the effluent discharge point.

iii If two or more discharge locations discharge to the same receiving water, LUP Type 3 dischargers may sample the receiving water at a single upstream and downstream location.

f. LUP Type 2 & 3 Monitoring Requirements for Non-Visible Pollutants

LUP Type 2 & 3 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where LUP Type 2 & 3 dischargers believe pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help LUP Type 2 & 3 dischargers determine when to collect samples.

(2) LUP Type 2 & 3 dischargers are not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 2 & 3 dischargers shall collect samples down-gradient from the discharge locations where the visual observations were made triggering the monitoring and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 2 & 3 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 2 & 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 2 & 3 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[13]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 2 & 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 2 & 3 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed.

[13] Sample collected at a location unaffected by construction activities

Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 2 & 3 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

g. LUP Type 2 & 3 Visual Observation and Sample Collection Exceptions

i LUP Type 2 & 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. Type 2 & 3 LUP dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

ii If the LUP Type 2 or 3 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

h. LUP Type 2 & 3 Storm Water Sample Collection and Handling Instructions

LUP Type 2 & 3 dischargers shall refer to Table 5 below for test Methods, detection Limits, and reporting Units. During storm water sample collection and handling, the LUP Type 2 & 3 discharger shall:

i Identify the parameters required for testing and the number of storm water discharge points that will be sampled. Request the laboratory to provide the appropriate number of sample containers, types of containers, sample container labels, blank chain of custody forms, and sample preservation instructions.

ii Determine how to ship the samples to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

iii Use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers could contaminate your samples.

iv Prevent sample contamination, by not touching, or putting anything into the sample containers before collecting storm water samples.

v Not overfilling sample containers. Overfilling can change the analytical results.

vi Tightly screw the cap of each sample container without stripping the threads of the cap.

vii Complete and attach a label to each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.

viii Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into the shipping container. Samples should be kept as close to 4° C (39° F) as possible until arriving at the laboratory. Do not freeze samples.

ix Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.

x Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.

xi Designate and train personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.

xii Refer to the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP) for more

information on sampling collection and analysis. See http://www.waterboards.ca.gov/water_issues/programs/swamp/[14]

Table 5. Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Levels	(LUP Type 3) Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Type 2 & 3	0.2	pH units	Lower = 6.5 upper = 8.5	Lower = 6.0 upper = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Type 2 & 3	1	NTU	250 NTU	500 NTU
SSC	ASTM Method D 3977-97[15]	Type 3 if Receiving Water Monitoring Trigger is exceeded	5	Mg/L	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[16] fixed-count of 600 org/sample	Type 3 LUPs > 30 acres	N/A	N/A	N/A	N/A

i. <u>LUP Type 2 & 3 Monitoring Methods</u>

i The LUP Type 2 or 3 discharger's project M&RP shall include a description of the following items:

(1) Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

[14] Additional information regarding SWAMP's QAPrP can be found at: http://www.waterboards.ca.gov/water_issues/programs/swamp/.

[15] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394

[16] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

(2) Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program a copy of the Chain of Custody form used when handling and shipping samples.

(3) Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section M.4.f above.

ii LUP Type 2 & 3 dischargers shall ensure that all sampling and sample preservation be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses shall be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). The LUP discharger shall conduct its own field analysis of pH and may conduct its own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

j. <u>LUP Type 2 & 3 Analytical Methods</u>

LUP Type 2 & 3 dischargers shall refer to Table 5 above for test Methods, detection Limits, and reporting Units.

i **pH**: LUP Type 2 & 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or pH test kit. The LUP discharger shall record pH monitoring results on paper and retain these records in accordance with Section M.4.o, below.

ii **Turbidity**: LUP Type 2 & 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results shall

be recorded in the site log book in Nephelometric Turbidity Units (NTU).

iii **Suspended sediment concentration (SSC)**: LUP Type 3 dischargers exceeding the turbidity Receiving Water Monitoring Trigger, shall perform SSC analysis using ASTM Method D3977-97.

iv **Bioassessment**: LUP Type 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

k. Watershed Monitoring Option

If an LUP Type 2 or 3 discharger is part of a qualified regional watershed-based monitoring program the LUP Type 2 or 3 discharger may be eligible for relief from the monitoring requirements in this Attachment. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program if it determines that the watershed-based monitoring program will provide information to determine each discharger's compliance with the requirements of this General Permit.

l. Particle Size Analysis for Risk Justification

LUP Type 2 & 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

m. NAL Exceedance Report

i In the event that any effluent sample exceeds an applicable NAL, the Regional Water Boards may require LUP Type 2 & 3 dischargers to submit NAL Exceedance Reports.

ii LUP Type 2 & 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

iii LUP Type 2 & 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the exceedance report is filed.

iv LUP Type 2 & 3 dischargers shall include in the NAL Exceedance Report:

(1) the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit"); and
(2) the date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
(3) Description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

n. Monitoring Records

LUP Type 2 & 3 dischargers shall ensure that records of all storm water monitoring information and copies of all reports (including Annual Reports) required by this General Permit be retained for a period of at least three years. LUP Type 2 & 3 dischargers may retain records off-site and make them available upon request. These records shall include:

i The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge);

ii The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

iii The date and approximate time of analyses;

iv The individual(s) who performed the analyses;

v A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and all chain of custody forms;

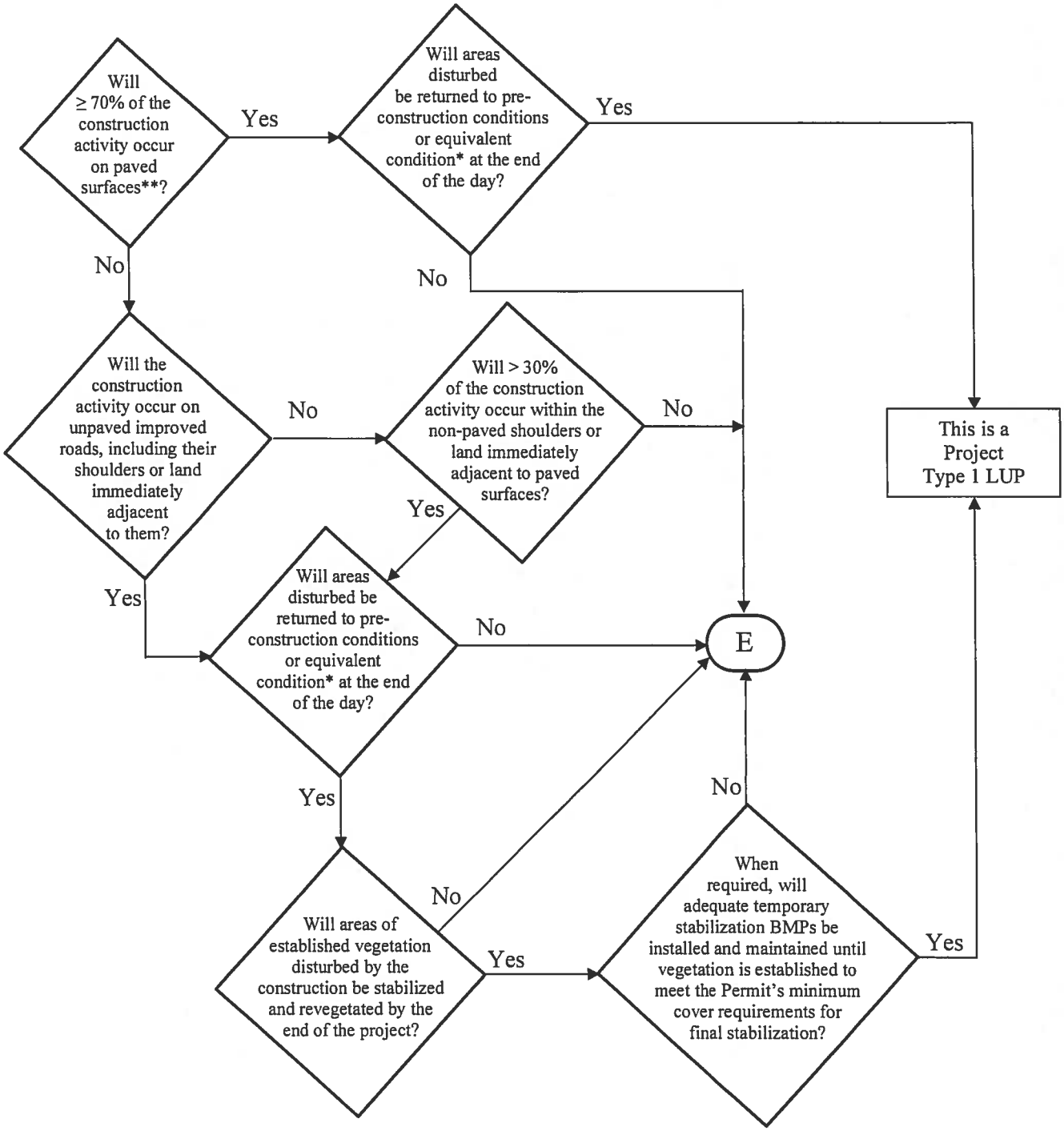
vi Quality assurance/quality control records and results;

vii Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Section M.4.a above);

viii Visual observation and sample collection exception records (see Section M.4.g above); and

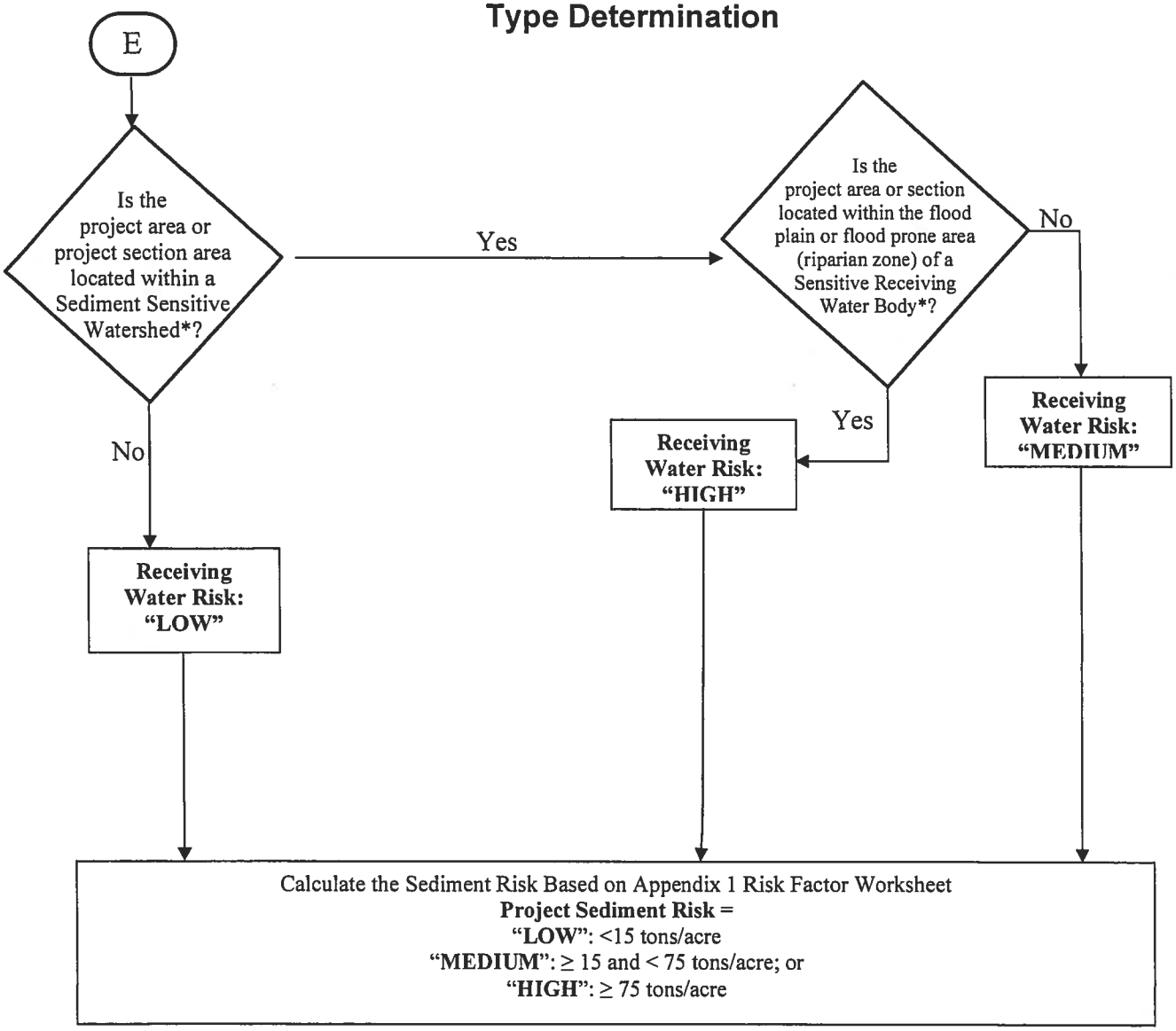
ix The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination



*See Definition of Terms
** Or: "Will < 30% of the soil disturbance occur on unpaved surfaces?

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination



* See Definition of Terms

PROJECT SEDIMENT RISK

RECEIVING WATER RISK	LOW	MEDIUM	HIGH
LOW	Type 1	Type 1	Type 2
MEDIUM	Type 1	Type 2	Type 3
HIGH	Type 2	Type 3	Type 3

ATTACHMENT A.1
Definition of Terms

1. **Equivalent Condition** – Means disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.
2. **Linear Construction Activity** – Linear construction activity consists of underground/ overhead facilities that typically include, but are not limited to, any conveyance, pipe or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/ tower pad and cable/ wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/ borrow locations.
3. **Sediment Sensitive Receiving Water Body** – Defined as a water body segment that is listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or is designated with beneficial uses of SPAWN, MIGRATORY, and COLD.
4. **Sediment Sensitive Watershed** – Defined as a watershed draining into a receiving water body listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or a water body designated with beneficial uses of SPAWN, MIGRATORY, and COLD.

ATTACHMENT A.2
PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS FOR LINEAR UNDERGROUND/OVERHEAD PROJECTS TO COMPLY WITH THE CONSTRUCTION GENERAL PERMIT

GENERAL INSTRUCTIONS

Who Must Submit

This permit is effective on July 1, 2010.

The Legally Responsible Person (LRP) for construction activities associated with linear underground/overhead project (LUP) must electronically apply for coverage under this General Permit on or after July 1, 2010. If it is determined that the LUP construction activities require an NPDES permit, the Legally Responsible Person[1] (LRP) shall submit PRDs for this General Permit in accordance with the following:

LUPs associated with Private or Municipal Development Projects

1. For LUPs associated with pre-development and pre-redevelopment construction activities:

   The LRP must obtain coverage[2] under this General Permit for its pre-development and pre-redevelopment construction activities where the total disturbed land area of these construction activities is greater than 1 acre.

2. For LUPs associated with new development and redevelopment construction projects:

   The LRP must obtain coverage under this General Permit for LUP construction activities associated with new development and redevelopment projects where the total disturbed land area of the LUP is greater than 1 acre. Coverage under this permit is not required where the same LUP construction activities are covered by another NPDES permit.

LUPs not associated with private or municipal new development or redevelopment projects:

The LRP must obtain coverage under this General Permit on or after July 1, 2010 for its LUP construction activities where the total disturbed land area is greater than 1 acre.

PRD Submittal Requirements

Prior to the start of construction activities a LRP must submit PRDs and fees to the State Water Board for each LUP.

New and Ongoing LUPs

Dischargers of new LUPs that commence construction activities after the adoption date of this General Permit shall file PRDs prior to the commencement of construction and implement the SWPPP upon the start of construction.

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[1] person possessing the title of the land on which the construction activities will occur for the regulated site
[2] obtain coverage means filing PRDs for the project.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Dischargers of ongoing LUPs that are currently covered under State Water Board Order No. 2003-0007 (Small LUP General Permit) shall electronically file Permit Registration Documents no later than July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 2003-0007-DWQ will be terminated. All existing dischargers shall be exempt from the risk determination requirements in Attachment A. All existing dischargers are therefore subject to LUP Type 1 requirements regardless of their project's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the risk determination requirements in Attachment A.

Where to Apply

The Permit Registration Documents (PRDs) can be found at www.waterboards.ca.gov/water_issues/programs/stormwater/

Fees

The annual fee for storm water permits are established through the State of California Code of Regulations.

When Permit Coverage Commences

To obtain coverage under the General Permit, the LRP must include the complete PRDs and the annual fee. All PRDs deemed incomplete will be rejected with an explanation as to what is required to complete submittal. Upon receipt of complete PRDs and associated fee, each discharger will be sent a waste discharger's identification (WDID) number.

Projects and Activities Not Defined As Construction Activity

1. LUP construction activity does not include routine maintenance projects to maintain original line and grade, hydraulic capacity, or original purpose of the facility. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

    - Maintain the original purpose of the facility, or hydraulic capacity.
    - Update existing lines[3] and facilities to comply with applicable codes, standards and regulations regardless if such projects result in increased capacity.
    - Repairing leaks.

    Routine maintenance does not include construction of new[4] lines or facilities resulting from compliance with applicable codes, standards and regulations.

[3] Update existing lines includes replacing existing lines with new materials or pipes.
[4] New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must acquire new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

2. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

3. Tie-ins conducted immediately adjacent to "energized" or "pressurized" facilities by the discharger are not considered small construction activities where all other LUP construction activities associated with the tie-in are covered by a NOI and SWPPP of a third party or municipal agency.

Calculating Land Disturbance Areas of LUPs

The total land area disturbed for LUPs is the sum of the:

- Surface areas of trenches, laterals and ancillary facilities, plus
- Area of the base of stockpiles on unpaved surfaces, plus
- Surface area of the borrow area, plus
- Areas of paved surfaces constructed for the project, plus
- Areas of new roads constructed or areas of major reconstruction to existing roads (e.g. improvements to two-track surfaces or road widening) for the sole purpose of accessing construction activities or as part of the final project, plus
- Equipment and material storage, staging, and preparation areas (laydown areas) not on paved surfaces, plus
- Soil areas outside the surface area of trenches, laterals and ancillary facilities that will be graded, and/or disturbed by the use of construction equipment, vehicles and machinery during construction activities.

Stockpiling Areas

Stockpiling areas, borrow areas and the removal of soils from a construction site may or may not be included when calculating the area of disturbed soil for a site depending on the following conditions:

- For stockpiling of soils onsite or immediately adjacent to a LUP site and the stockpile is not on a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation.

- The surface area of borrow areas that are onsite or immediately adjacent to a project site are to be included in the disturbed area calculation.

- For soil that is hauled offsite to a location owned or operated by the discharger that is not a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

- For soil that is brought to the project from an off-site location owned or operated by the discharger the surface area of the borrow pit is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

- Trench spoils on a paved surface that are either returned to the trench or excavation or hauled away from the project daily for disposal or reuse will not be included in the disturbed area calculation.

If you have any questions concerning submittal of PRDs, please call the State Water Board at (866) 563-3107.

ATTACHMENT B
PERMIT REGISTRATION DOCUMENTS (PRDs) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

A. All Linear Construction Projects shall comply with the PRD requirements in Attachment A.2 of this Order.

B. Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Storm Water Permit (General Permit). Any construction activity that is a part of a larger common plan of development or sale must also be permitted, regardless of size. (For example, if 0.5 acre of a 20-acre subdivision is disturbed by the construction activities of discharger A and the remaining 19.5 acres is to be developed by discharger B, discharger A must obtain a General Storm Water Permit for the 0.5 acre project).

Other discharges from construction activities that are covered under this General Permit can be found in the General Permit Section II.B.

It is the LRP's responsibility to obtain coverage under this General Permit by electronically submitting complete PRDs (Permit Registration Documents).

In all cases, the proper procedures for submitting the PRDs must be completed before construction can commence.

C. Construction Activity Not Covered By This General Permit

Discharges from construction that are not covered under this General Permit can be found in the General Permit Sections II.A &B..

D. Annual Fees and Fee Calculation

Annual fees are calculated based upon the total area of land to be disturbed not the total size of the acreage owned. However, the calculation includes all acres to be disturbed during the duration of the project. For example, if 10 acres are scheduled to be disturbed the first year and 10 in each subsequent year for 5 years, the annual fees would be based upon 50 acres of disturbance. The State Water Board will evaluate adding acreage to an existing Permit Waste Discharge Identification (WDID) number on a case-by-case basis. In general, any acreage to be considered must be contiguous to the permitted land area and the existing

SWPPP must be appropriate for the construction activity and topography of the acreage under consideration. As acreage is built out and stabilized or sold, the Change of Information (COI) form enables the applicant to remove those acres from inclusion in the annual fee calculation. Checks should be made payable to: State Water Board.

The Annual fees are established through regulations adopted by the State Water Board. The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI, based on the total acreage to be disturbed during the life of the project. Annual fees are subject to change by regulation.

Dischargers that apply for and satisfy the Small Construction Erosivity Wavier requirements shall pay a fee of $200.00 plus an applicable surcharge, see the General Permit Section II.B.7.

E. When to Apply

LRP's proposing to conduct construction activities subject to this General Permit must submit their PRDs prior to the commencement of construction activity.

F. Requirements for Completing Permit Registration Documents (PRDs)

All dischargers required to comply with this General Permit shall electronically submit the required PRDs for their type of construction as defined below.

G. Standard PRD Requirements (All Dischargers)

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee
6. Certification

H. Additional PRD Requirements Related to Construction Type

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
   a. Post-Construction Water Balance Calculator (Appendix 2).

2. Dischargers who are proposing to implement ATS shall submit:
   a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.

b. Certification proof that design done by a professional in accordance with Attachment F.

3. Dischargers who are proposing an alternate Risk Justification:
   a. Particle Size Analysis.

I. Exceptions to Standard PRD Requirements

Construction sites with an R value less than 5 as determined in the Risk Assessment are not required to submit a SWPPP.

J. Description of PRDs

1. Notice of Intent (NOI)

2. Site Map(s) Includes:
   a. The project's surrounding area (vicinity)
   b. Site layout
   c. Construction site boundaries
   d. Drainage areas
   e. Discharge locations
   f. Sampling locations
   g. Areas of soil disturbance (temporary or permanent)
   h. Active areas of soil disturbance (cut or fill)
   i. Locations of all runoff BMPs
   j. Locations of all erosion control BMPs
   k. Locations of all sediment control BMPs
   l. ATS location (if applicable)
   m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
   n. Locations of all post-construction BMPs
   o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices

3. **SWPPPs**
   A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.

4. **Risk Assessment**
   All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1.

   a. The Standard Risk Assessment includes utilization of the following:
      i. Receiving water Risk Assessment interactive map

ii. EPA Rainfall Erosivity Factor Calculator Website
iii. Sediment Risk interactive map
iv. Sediment sensitive water bodies list

b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator

5. **Post-Construction Water Balance Calculator**
All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.

6. **ATS Design Document and Certification**
All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (See Attachment F).

To obtain coverage under the General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

Questions?

If you have any questions on completing the PRDs please email stormwater@waterboards.ca.gov or call (866) 563-3107.

ATTACHMENT C
RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.

2. Risk Level 1 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector's name, title, and signature.

H. Rain Event Action Plan

Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. Construction Site Monitoring Program Requirements

a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):

i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 1 – Visual Observation Exemptions**

a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. **Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. **Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. **Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[2]

h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. **Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. **Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

[2] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).

i. Visual observation and sample collection exception records (see Section I.4 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT D
RISK LEVEL 2 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 2 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk level 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 2 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 2 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 2 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 2 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 2 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain all fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 2 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 2 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 2 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 2 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 2 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 2 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 2 dischargers shall implement effective wind erosion control.

2. Risk Level 2 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 2 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 2 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 2 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

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[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.
[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage.
[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

F. Run-on and Run-off Controls

Risk Level 2 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 2 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 2 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 2 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 2 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 2 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any

likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number

4. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase
   b. Trades active on the construction site during each construction phase
   c. Trade contractor information
   d. Suggested actions for each project phase

5. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number

d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
f. Trades active on site during Inactive Construction
g. Trade contractor information
h. Suggested actions for inactive construction sites

6. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 2 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
2	X	X	X	X	X	X	

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs).

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 2 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 2 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 2 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 2 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 2 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 2 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i and c.iii above, Risk Level 2 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 2 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 2 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 2 – Water Quality Sampling and Analysis**

a. Risk Level 2 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 2 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 2 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 2 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

5. **Risk Level 2 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

a. Risk Level 2 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 2 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 2 dischargers shall ensure that storm water discharge collected and observed represent[4] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 2 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 2 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 2 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 "Storm Water Sample Collection and Handling Instructions" below.

6. **Risk Level 2 – Visual Observation and Sample Collection Exemptions**

a. Risk Level 2 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 2 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

[4] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment-laden water even if most water flowing through the fence is clear.

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 2 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 2 – Storm Water Sample Collection and Handling Instructions**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. Risk Level 2 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

c. Risk Level 2 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[5]

8. **Risk Level 2 – Monitoring Methods**

a. Risk Level 2 dischargers shall include a description of the following items in the CSMP:

i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program

[5] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/. QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

an example Chain of Custody form used when handling and shipping samples.

iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

b. Risk Level 2 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 2 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services. Risk Level 2 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 2 – Analytical Methods**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 2 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 2 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 2 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

10. **Risk Level 2 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

i. Risk Level 2 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

ii. Risk Level 2 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

iii. Risk Level 2 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 2 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

i. Risk Level 2 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

ii. Risk Level 2 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

iii. Risk Level 2 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 2 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 2 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual

inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 2 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 2 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 2 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 2 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 2 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 2 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 2 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[6]

h. Risk Level 2 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 2 – Watershed Monitoring Option**

Risk Level 2 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

[6] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

13. **Risk Level 2 – Particle Size Analysis for Project Risk Justification**

Risk Level 2 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 2 – Records**

Risk Level 2 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 2 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

largest subbasins within the Yucaipa Basin. Five active wells, four monitoring wells and one inactive well are located within this subbasin.

Singleton Subbasin - The Singleton Subbasin is located in the southern most portion of the Yucaipa Valley Water District's service area within the City of Calimesa in Riverside County. The subbasin contains one monitoring well

Triple Falls Creek Subbasin - The Triple Falls Creek subbasin is the northernmost subbasin within Yucaipa Valley Water District's service area. This subbasin contains one active well, two abandoned wells and two inactive wells just outside of the subbasin boundary.

Western Heights Subbasin - The Western Heights Subbasin is located in the western portion of the Yucaipa Basin and extends into the City of Redlands. The basin contains no wells utilized by the Yucaipa Valley Water District. Groundwater extraction from this basin is generally from the Western Heights Mutual Water Company.

Wildwood Subbasin - The Wildwood Subbasin is located in the eastern portion of the Yucaipa Basin and possesses the largest amount of active wells utilized by YVWD totaling 11 active wells. Additional well status results in three inactive wells, four standby and two abandoned wells.

Wilson Subbasin - The Wilson subbasin is one of the largest subbasins within the Yucaipa Basin. The Wilson Subbasin has a large storage capacity (estimated at 125,000 acre-feet by Carollo, 1985). The safe yield of the subbasin is small (estimated at 1,500 AFY (Wildermuth, 2005) compared to the large storage capacity. Existing depth to groundwater in the Wilson basin average roughly 175 to 425 feet below ground surface (Wildermuth, 2005).

The additional spreading of water in the Wilson Creek spreading grounds and utilization of the Oak Glen Creek stream channel for recharge has contributed to increased groundwater levels. By maximizing the existing spreading grounds the capability exists to spread from 7,000 to 14,000 acre-feet of surface water annually into the Yucaipa Basin.

With ample storage, ability to recharge the basin through in-lieu use of surface water and by direct spreading surface waters and apparent flexibility in managing groundwater levels without subsidence problems, the Yucaipa Basin could be conjunctively managed both to meet normal annual demands and to meet water resource needs in the event of a drought and curtailment or loss of inconsistent surface water supplies, resulting in a highly reliable water supply. Current goals are to secure agreements to not pump beyond the long-term safe yield of the basin by utilizing the imported surface water supplemental supply.

The Yucaipa Valley Water District has cooperated with the U.S. Geological Survey and the San Bernardino Valley Municipal Water District to construct real-time groundwater monitoring wells in the area. Groundwater level data indicates that the groundwater levels in the Wilson subbasin have increased in 2009 and 2010. This is attributed to the additional supplemental supply of State Water Project water (Groundwater Water Recharge/Recovery Project, 2009).

Provide a copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (California Water Code Section 10631(b)(1))

The Yucaipa Valley Water District is currently involved with development of a groundwater management plan (AB 3030 Plan) to proscribe collective management of the Yucaipa Groundwater Basin. With ample storage, ability to recharge the basin by spreading surface waters and apparent flexibility in managing groundwater levels without subsidence problems, the Yucaipa Basin could be conjunctively managed both to meet normal annual demands and to meet water resource needs in the event of a drought and curtailment or loss of inconsistent surface water supplies, resulting in a highly reliable water supply. Current goals are to secure agreements to not pump beyond the safe yield of the basin, supplementing supplies with imported surface.

4.3.2 San Timoteo Groundwater Basin

The San Timoteo Groundwater Basin is located downstream from the Yucaipa and Beaumont groundwater basins in northeastern Riverside County and Southeastern San Bernardino County. The characteristics of this groundwater basin differ between the Department of Water Resources and the State Water Resources Control Board. This groundwater basin covers approximately 29 square miles. Groundwater movement in the San Timoteo Groundwater Basin trends from the east to the west. Surface water in the area is drained by San Timoteo Creek.

As with the Yucaipa and Beaumont Basins, groundwater is found in alluvium and in the San Timoteo Formation to depths of 700 to 1000 feet. Estimates for total groundwater storage capacity within the basin vary. On the basis of information presented by DWR (2004), the total groundwater capacity in the basin appears to be approximately 1,000,000 AF.

On the basis of information presented in DWR Bulletin No. 118, it appears that long-term recharge to the San Timoteo Basin is significantly higher than recharge within either the Yucaipa or Beaumont Basins (estimated to be on the order of 20,000 AFY). No significant long-term decline in depths to groundwater is reported in the San Timoteo Basin.

The San Timoteo Basin is not adjudicated, and reliable estimates of total groundwater pumping within the San Timoteo basin are not available. Because water table elevations within the basin have not declined (and remain near the surface in some areas along San Timoteo Creek), it may be concluded that long-term pumping within the basin is less than the long-term average recharge.

4.3.3 Beaumont Groundwater Basin

The Beaumont Basin is located in northwestern Riverside County, south of the Yucaipa Basin. The basin is drained by San Timoteo Creek, a tributary of the Santa Ana River and covers approximately 26 square miles. Groundwater elevations generally slope from the northeast to southwest in the basin.

Groundwater within the basin is predominantly found in Holocene age alluvium and in the San Timoteo Formation. While the San Timoteo Formation extends to depths in excess of 1500 feet, water bearing sediments within the Beaumont Basin exist to depths of 700 to 1000 feet.

Estimates for total groundwater storage capacity within the basin vary. The Beaumont Basin storage capacity is estimated at approximately 1,000,000 AF. (Beaumont Basin Watermaster, 2007)

In February 2004 the San Timoteo Watershed Management Authority filed a judgment adjudicating the groundwater rights in the Beaumont Basin and assigned the Beaumont Basin Watermaster with the authority to manage the groundwater basin. The Beaumont Basin Watermaster is comprised of managers from the Beaumont Cherry Valley Water District, City of Banning, City of Beaumont, South Mesa Mutual Water Company and Yucaipa Valley Water District. The Beaumont Basin Watermaster reports a long-term yield for the Beaumont Basin of 8,560 AFY. Extraction within the basin is limited to a long-term average of 16,000 AFY (160,000 AF over 10 years). During the past four years, the Watermaster reports annual groundwater extractions in the basin that range from 14,100 AFY to 19,300 AFY. Yucaipa Valley Water District pumping from the Beaumont basin was approximately 527 AFY during FY 2008/2009

For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board (California Water Code Section 10631(b)(2)).

Provide a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (California Water Code Section 10631(b)(2)).

The adjudication of the Beaumont Basin has defined overlying and appropriator pumping rights and also allows for supplemental water to be stored and recovered from the basin.

Table 4-5 Appropriators of the Beaumont Basin

Producer	Average Production During 1997-2001 (acre-ft/yr)	Share of Safe Yield Allocated to Appropriators	Initial Estimate of Appropriate Rights[1] (acre-ft/yr)	Controlled Overdraft and Supplemental Water Recharge Allocation[2] (acre-ft/yr)	Operating Yield (acre-ft/yr)
City of Banning	2,170	31.43%	882	5,029	5,910
City of Beaumont	0	0.00%	0	0	0
Beaumont Cherry Valley Water District	2,936	42.51%	1,193	6,802	7,995
South Mesa Water Company	862	12.48%	350	1,996	2,346
Yucaipa Valley Water District	938	13.58%	381	2,173	2,554
Total	6,906	100.00%	2,805	16,000	18,805

[1] *Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.*
[2] *Volumes shown here should be consistent with Tables 17 and 18.*

The Beaumont Basin, under this adjudication, is considered to be in a condition of overdraft with assigned maximum annual overlying production rights of 8,650 acre-feet. The Yucaipa Valley Water District has a right to an operating yield of 2,552 acre-feet annually from the Beaumont

Basin, which consists of 381 acre-feet of appropriative right and 2,173 acre-feet of Controlled Overdraft and Supplemental Water Recharge Allocation. The District can deliver amounts in addition to the 2,552 acre-feet as supported from overlying water right holders.

4.4 Groundwater Basin Management

For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition (California Water Code Section 10631(b)(2)).

The two basins that have not been adjudicated within the Yucaipa Valley Water District's service area are the Yucaipa Basin and San Timoteo Basin. Under present management conditions the basins are expected to have controlled overdraft conditions. Prior to 2007, the Yucaipa Basin was considered in overdraft due to over extractions by the Yucaipa Valley Water District, South Mesa Water Company and Western Heights Mutual Water Company. In 2005, the Yucaipa Valley Water District began treating State Water Project water through a newly constructed Yucaipa Valley Regional Filtration Facility. This has provided an opportunity to alleviate pumping from local supplies increasing groundwater levels to 70 feet in one well location in the Wilson subbasin (USGS Groundwater Monitoring Levels).

Table 4-6 - Basin Plan Groundwater Quality Objectives (RWQCB)

Parameter	Type of Objective	Basin Plan Water Quality Objective (mg/l)		
		Yucaipa Basin	Beaumont Basin	San Timoteo Basin
Total Dissolved Solids (TDS)	Maximum Benefit	370	330	400
	Antidegradation	320	230	300
Nitrate-nitrogen	Maximum Benefit	5.0	5.0	5.0
	Antidegradation	4.2	1.5	2.5

- Basin Plan objectives established by Regional Board Resolution R8-2004-001.
- Maximum Benefit objectives apply unless the Regional Board determines that lowering of water quality is not to the maximum benefit of the people of the State of California. Otherwise, the antidegradation objectives apply.

Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (California Water Code Section 10631(b)(3)).

Table 4-7 – Amount of Groundwater Extracted

Basin name(s)	2006	2007	2008	2009	2010
Yucaipa Groundwater Basin	2,881.0	2,632.3	2,047.2	1,903.5	2,159.4
Beaumont Groundwater Basin	660.6	548.4	186.3	164.4	219.1
San Timoteo Groundwater Basin	0.0	0.0	0.0	0.0	0.0
Total Groundwater Pumped	3,541.6	3,180.7	2,233.5	2,067.9	2,378.5
Percentage of Total Water Supply	79.5%	65.4%	48.1%	45.1%	60.1%
Percentage of Potable Water Supply	87.5%	74.5%	53.0%	49.3%	65.8%

Units are in million gallons.

Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (California Water Code Section 10631(b)(4)).

Table 4-8 - Projected Amount of Groundwater to be Extracted

Basin name(s)	2015	2020	2025	2030	2035
Yucaipa Groundwater Basin	1,900	1,900	1,900	1,900	1,900
Beaumont Groundwater Basin	125	125	125	125	125
San Timoteo Groundwater Basin	75	75	75	75	75
Total Groundwater Pumped	2,100	2,100	2,100	2,100	2,100
Percentage of Total Water Supply	42.5%	39.4%	36.5%	33.8%	31.2%
Percentage of Potable Water Supply	47.5%	45.5%	43.5%	41.5%	39.5%

Units are in million gallons.

4.5 Imported Water Sources - State Water Project

The Yucaipa Valley Water District purchases imported water from two State Water Project contractors, the San Bernardino Valley Municipal Water District (SBVMWD) for the San Bernardino County portion of the service area, and the San Gorgonio Pass Water Agency (SGPWA), for the Riverside County portion of the service area.

The two State Water Contractors convey imported water from the Sacramento San Joaquin Delta, which is utilized as a supplemental potable water source to the local supply and is treated at the Yucaipa Valley Regional Filtration Facility. The imported water is also used for groundwater recharge and recycled water irrigation of landscaping at numerous sites throughout the community.

4.5.1 San Bernardino Valley Municipal Water District (SBVMWD)

The San Bernardino Valley Municipal Water District has an entitlement to 102,600 acre-feet of State Water Project water that is used for both direct deliveries to treatment plants and artificial recharge of the groundwater basins (Regional Water Management Plan, 2010). Yucaipa Valley

Water District received a total of 9,086 acre feet from SBVMWD for direct deliveries, groundwater recharge in the Wilson Basin and non-potable water for landscape use in 2010.

Table 4-9 - 2010 SBVMWD Water Supply Uses

Use	Million Gallons (Acre Feet)
Direct Deliveries	1,078.082 (3,317)
Groundwater Recharge	1,500.578 (4,603)
Recycled Water	383.376 (1,176)
Total	2,962.036 (9,086)

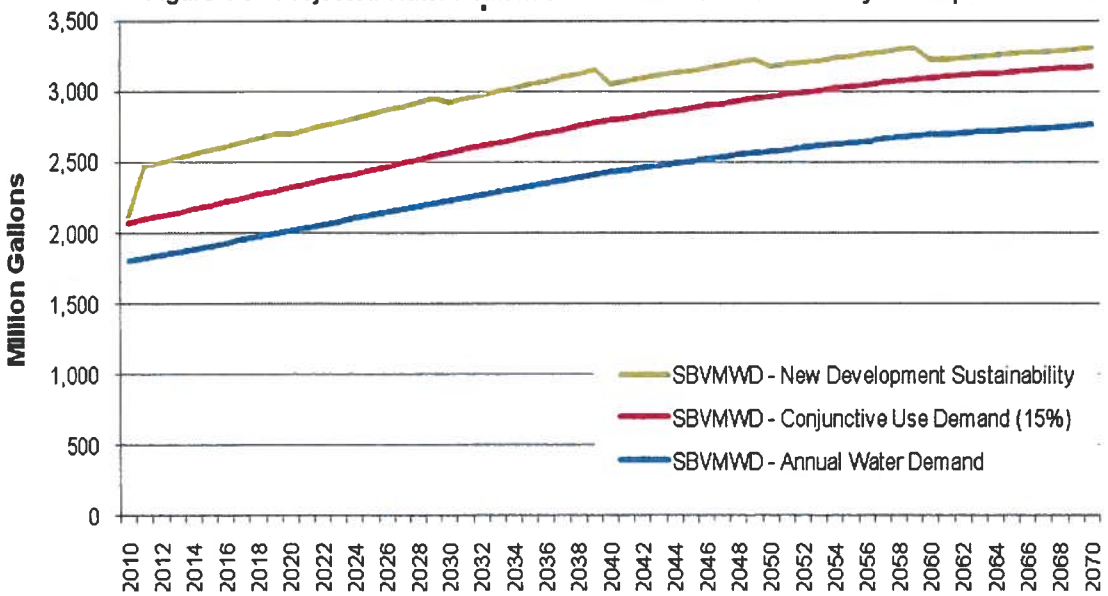
The following table and chart reflects the anticipated imported water demands from the San Bernardino Valley Municipal Water District.

Table 4-10 – Yucaipa Valley Water District Demand Projections Provided to Wholesale Supplier San Bernardino Valley Municipal Water District

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	1,800.0	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
Conjunctive Use Demands: Local Water Banking	270.0	286.0	302.5	318.8	335.2	350.3
New Development Long-Term Supply Sustainability Program	43.3	391.0	381.0	396.0	356.0	368.0
Total	2,113.3	2,583.9	2,700.2	2,839.8	2,925.7	3,053.6

Units in million gallons per year.

Figure 4-9 - Projected Water Demands of the San Bernardino Valley Municipal Water District



4.5.2 San Gorgonio Pass Water Agency (SGPWA)

The San Gorgonio Pass Water Agency has an entitlement to 17,300 acre-feet of State Water Project water that is used for both direct deliveries to treatment plants and artificial recharge of the groundwater basins. The San Gorgonio Pass Water Agency needs to secure an additional 22,000 acre-feet per year of supplemental water to meet the ultimate demand of 94,000 acre-feet per year by year 2045 (SGPWA Supplemental Water Supply Planning Study, October 2009).

Yucaipa Valley Water District received a total of 123.08 acre feet from the San Gorgonio Pass Water Agency for direct deliveries in 2010.

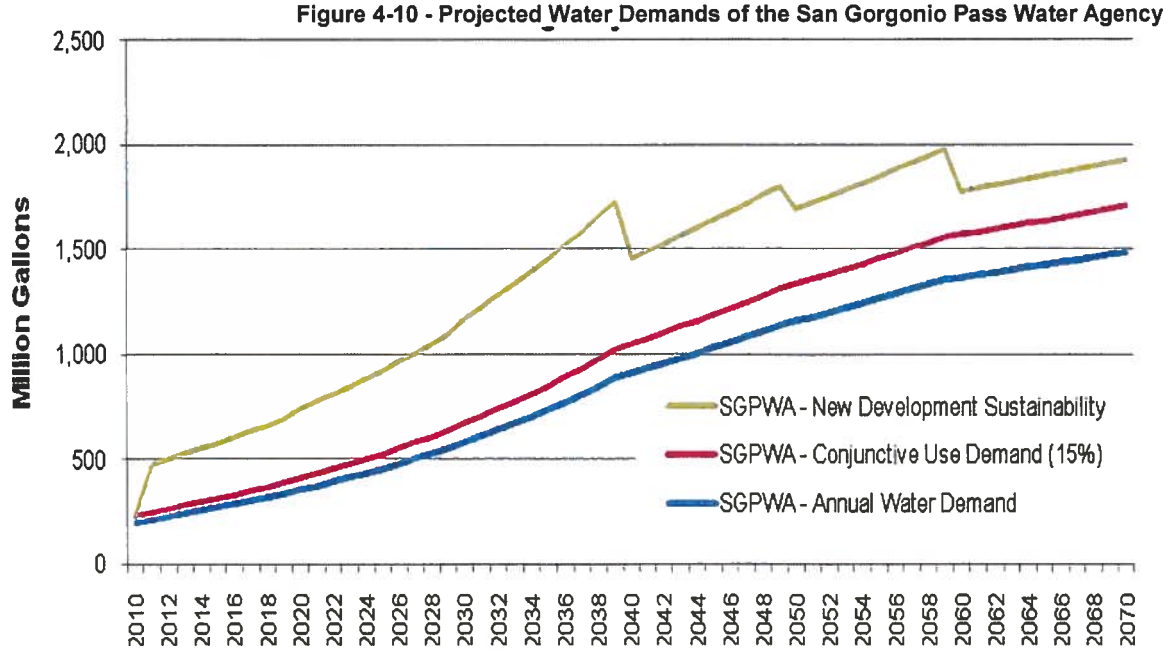
The following table and chart reflects the anticipated imported water demands from the San Gorgonio Pass Water Agency.

Table 4.11 – Yucaipa Valley Water District Demand Projections Provided to Wholesale Supplier San Gorgonio Pass Water Agency

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	200.0	269.0	351.8	454.9	579.7	736.3
Conjunctive Use Demands: Local Water Banking	30.0	40.4	52.8	68.2	87.0	110.4
New Development Long-Term Supply Sustainability Program	2.3	266.0	333.0	398.0	503.0	607.0
Total	232.3	575.4	737.6	921.1	1,169.7	1,453.7

Units in million gallons per year.

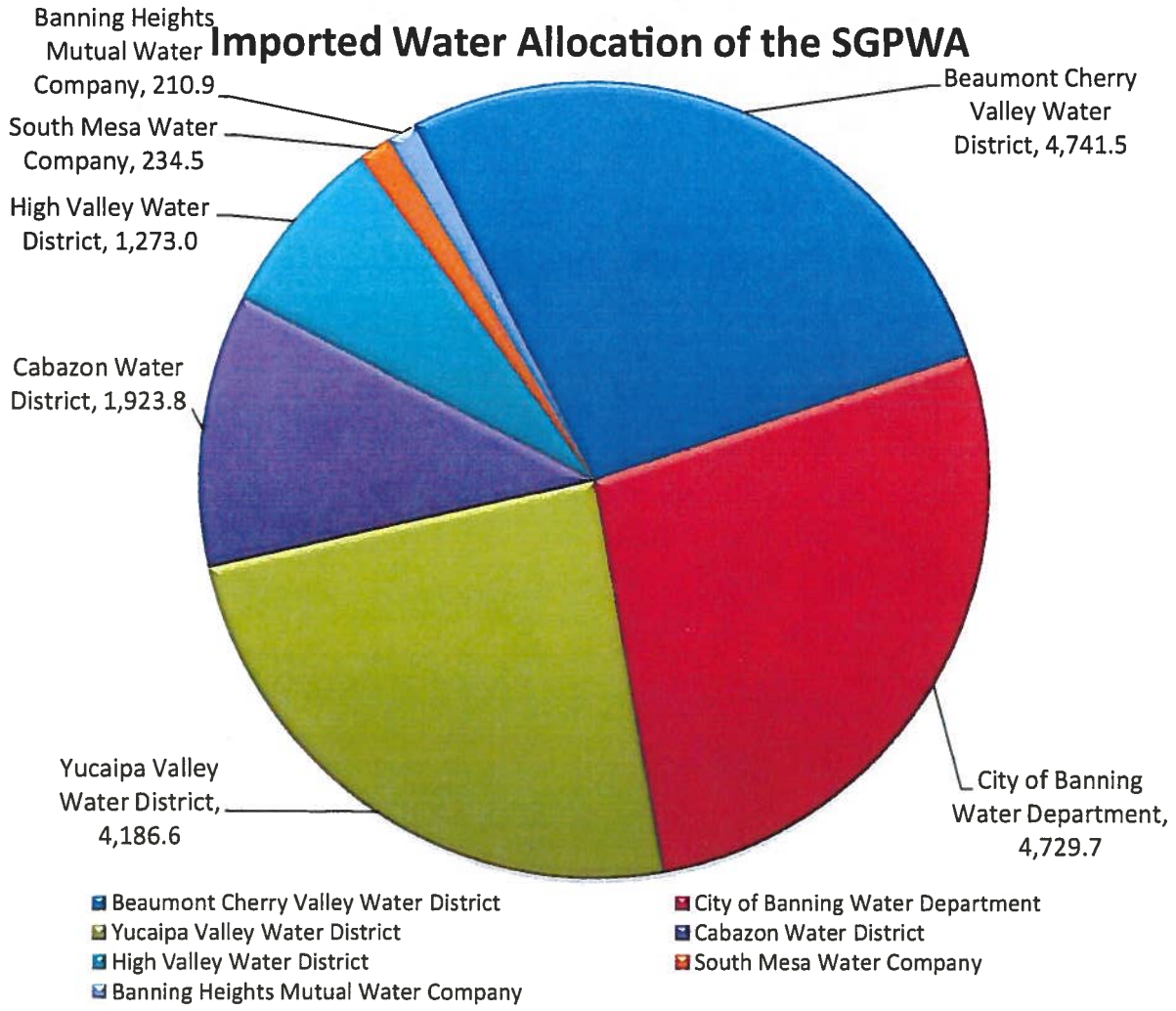
Figure 4-10 - Projected Water Demands of the San Gorgonio Pass Water Agency



The larger water retailers of the San Gorgonio Pass Water Agency have focused on ensuring that the limited water resources of the wholesale agency are not over allocated by those water retailers preparing Urban Water Management Plans and other water retailers not required to prepare these planning documents. Based on recent discussions between these water retailers, the proposed allocation illustrated below is being presented as a strategy to improve water management allowing for increased certainty and the assurance that water will not unintentionally become over allocated within the San Gorgonio Pass Water Agency service area. While there is a management-level consensus between the larger water retailers to implement the Imported Water Allocation, the concept has not been approved by the elected officials of each water retailer or the board of the San Gorgonio Pass Water Agency.

The water allocation is directly related to the number of acres within each retail water agency's service area. It is anticipated, any excess allocated water would be returned to the wholesale agency to determine the ultimate use of the water in excess of the baseline allocation.

Figure 4-11 - Proposed Water Allocation for theSan Gorgonio Pass Water Agency (Units of measurement are shown in Acre Feet)



4.6 Transfer Opportunities

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (California Water Code Section 10631(d)).

The Santa Ana-Mill Creek Cooperative Water Project Agreement permits the Yucaipa Valley Water District to exchange up to 32 cfs of water from the State Water Project for Mill Creek water when available. This source and exchange concept is highly variable, and largely depends on local hydrology and participation by other local water purveyors. Generally, the lack of storage limits the ability to use this water during dry years.

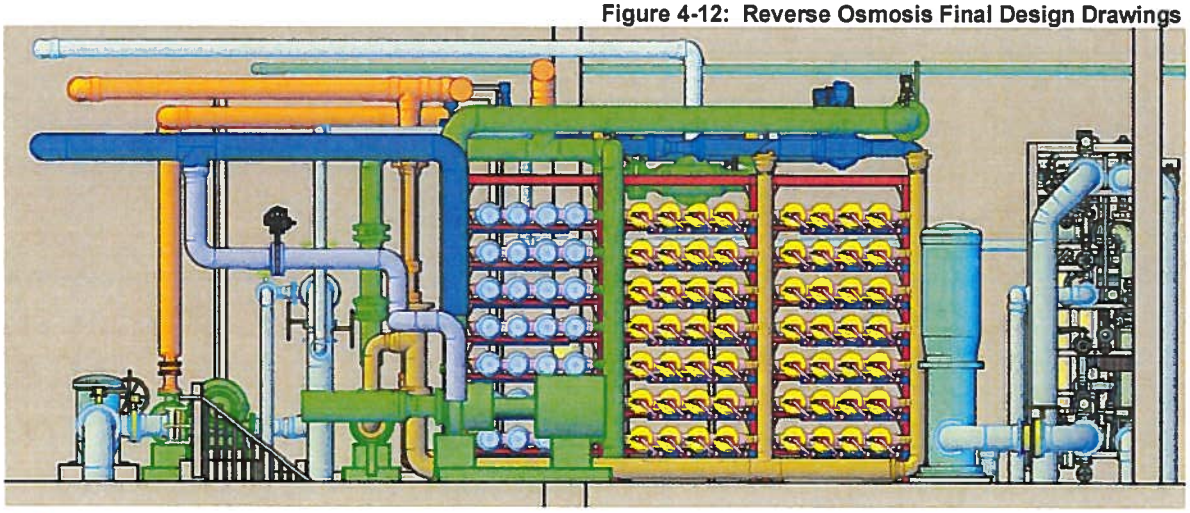
The Yucaipa Valley Water District is in the process of investigating the ability to participate in dry year purchase programs of water supply arranged by the Department of Water Resources, through the San Bernardino Valley Municipal Water District and the San Gorgonio Pass Water Agency, or pursue individual District initiated transfers as may be necessary and as supplies may be available. The District has not initiated nor does it have plans to initiate any short or long-term transfers for water at this time.

4.7 Desalinated Water Opportunities

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply (California Water Code Section 10631(i)).

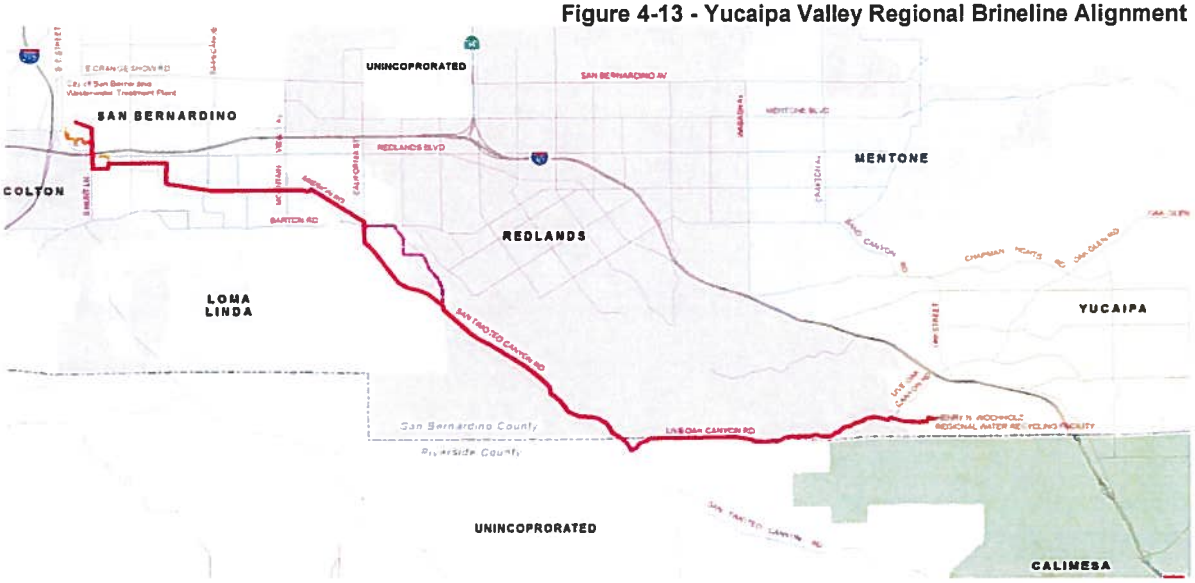
The Yucaipa Valley Water District's Water Supply Renewal Project includes the construction of reverse osmosis membrane treatment at the Yucaipa Valley Regional Water Filtration Facility (YVRWFF) for the treatment of imported water supplies in compliance with the basin plan objectives set by the Regional Water Quality Control Board. Additionally, the Yucaipa Valley Water District will be adding reverse osmosis membrane treatment equipment at the Wochholz Regional Water Recycling Facility (WRWRF) to produce high quality recycled water in compliance with the basin plan objectives.

Figure 4-12: Reverse Osmosis Final Design Drawings



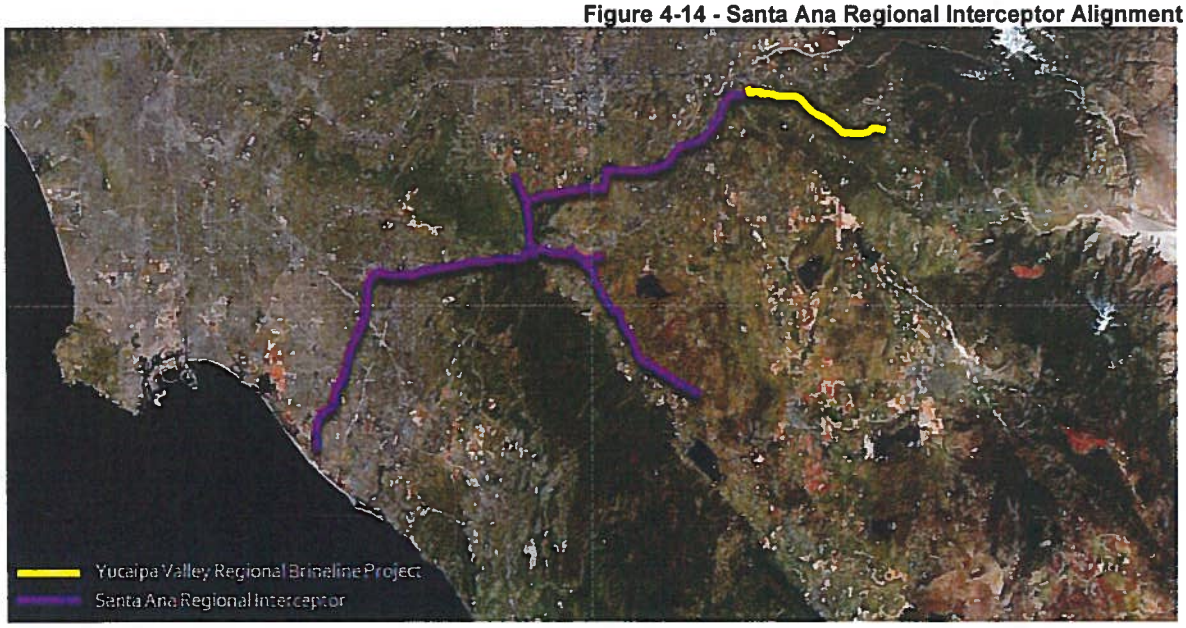
Both of these advanced treatment systems are dependent upon the completion of the Yucaipa Valley Regional Brineline, a 15-mile extension of the Santa Ana Regional Interceptor to the Wochholz Regional Water Recycling Facility.

Figure 4-13 - Yucaipa Valley Regional Brineline Alignment



The Yucaipa Valley Regional Brineline began construction in September 2010. The 15-mile pipeline will connect the Wochholz Regional Water Recycling Facility with the eastern termination point of the Santa Ana Regional Interceptor owned and operated by the Santa Ana Watershed Project Authority. From the termination point, the At this point the brineline extends another 73 miles traversing San Bernardino, Riverside and Orange counties to Orange County Sanitation District Wastewater Treatment Plant No. 2 in Huntington Beach, where the salt water is treated and discharged to the Pacific Ocean.

Figure 4-14 - Santa Ana Regional Interceptor Alignment

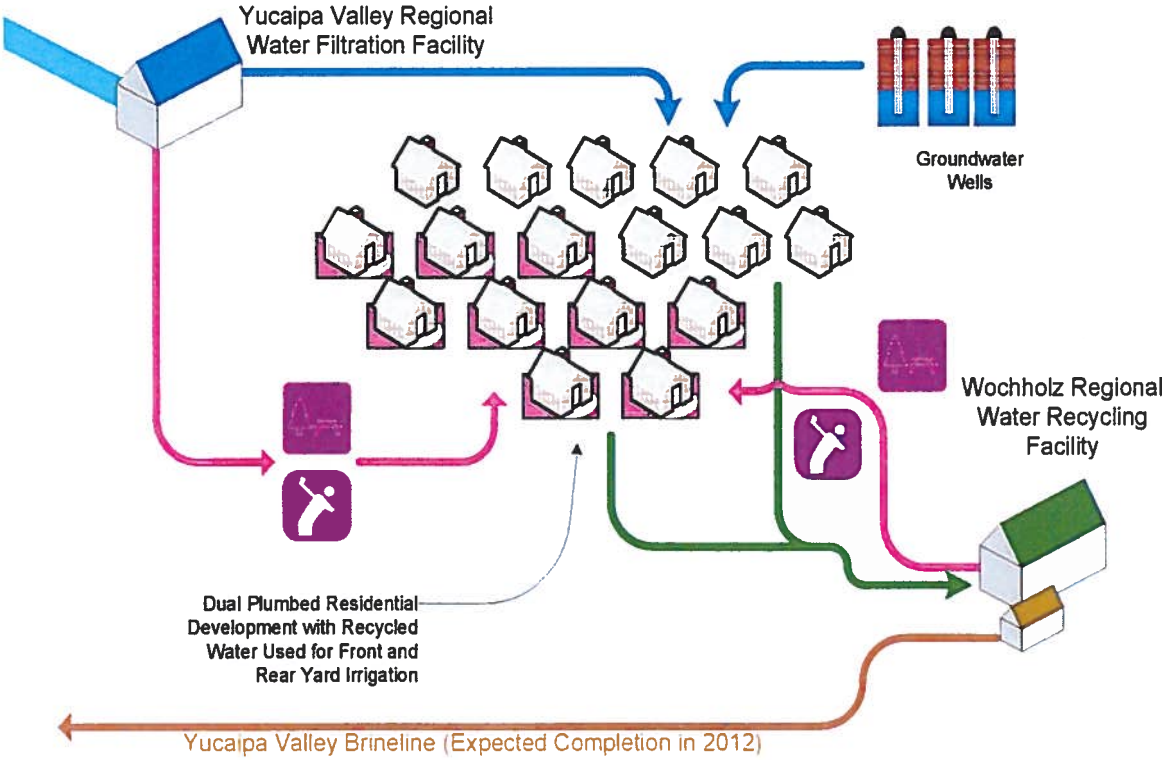


4.8 Recycled Water Opportunities

Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area (California Water Code Section 10633).

The Yucaipa Valley Water District is one of the most proactive advocates of recycled water use and implementation in the Inland Empire. The Board of Directors has adopted planning guidelines that require the use of recycled water for front and rear yard irrigation of new development throughout the District's service area.

Figure 4-15 - Conceptual Schematic of Dual Plumbed Homes



Recycled water is currently used to provide up to 10 percent of Yucaipa Valley Water District's overall water demands. A significant portion of the Yucaipa Valley Water District's projected future water demands will be met with the use of recycled water for irrigation of golf courses, parks, landscape areas and front-/rear-yard irrigation of residential dwellings.

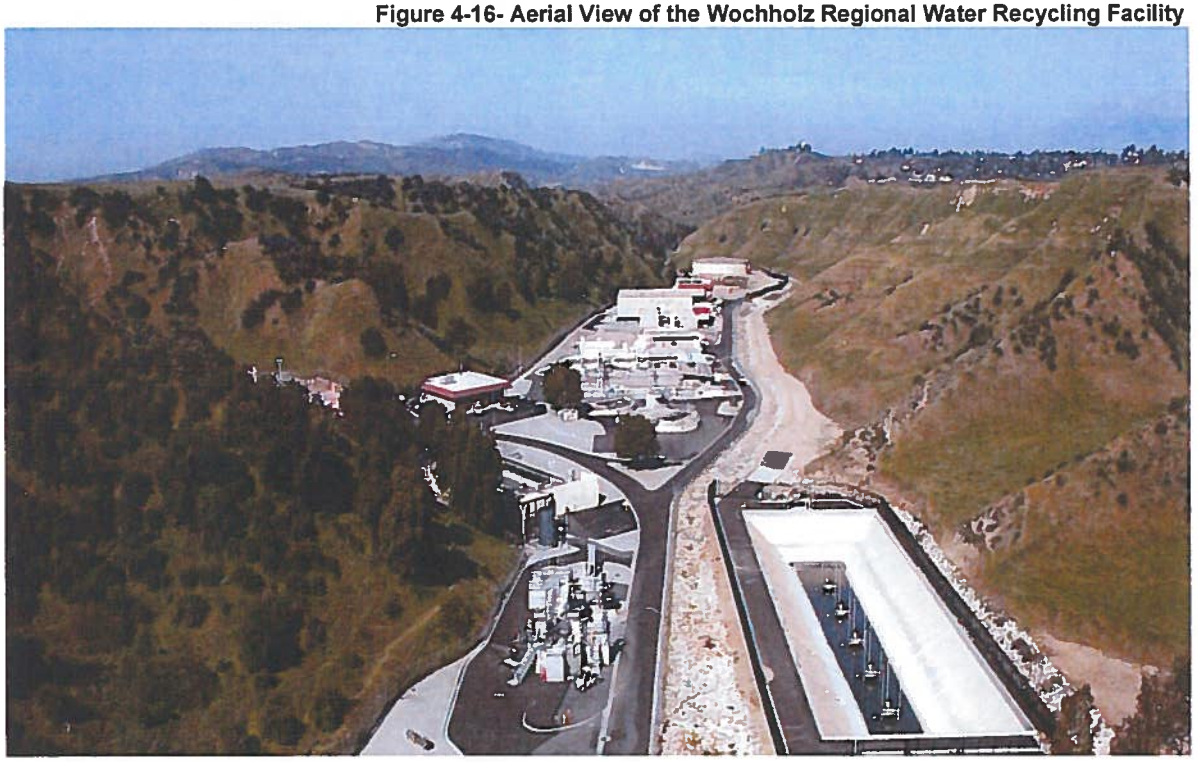
To serve the projected water demands, the Yucaipa Valley Water District has implemented an extensive dual water distribution system. The dual water system includes a drinking water conveyance system to convey potable water to customers and a separate recycled water distribution system to convey recycled water to customers

Describe the wastewater collection and treatment systems in the supplier's service area including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal (California Water Code Section 10633(a)).

As water becomes an increasingly precious commodity, Yucaipa Valley Water District is stepping up its recycling efforts so that more water can be reused on golf courses, school grounds, roadside medians and for other landscaping purposes -- even the front and rear yards of new homes.

To achieve this objective, the Yucaipa Valley Water District recently expanded and enhanced the sewer treatment plant, or water recycling facility, to a capacity of 8 million gallons per day. The District's water recycling facility is one of a relatively small number of sewer treatment facilities in the country to be equipped with microfiltration filters and ultraviolet light for disinfection. The treatment process used to transform our sewer water to recycled water is very similar to some drinking water treatment plants. This provides high quality recycled water that is also extremely safe.

Figure 4-16- Aerial View of the Wochholz Regional Water Recycling Facility



The new microfiltration technology is important because it sets the stage for the District to install a reverse osmosis system at the water recycling facility to further purify our recycled water. While the microfiltration system does not allow particles larger than 0.1 micrometer to pass through the filtration system and become part of the recycled water supply, a reverse osmosis system will create a physical barrier to stop salt molecules while allowing water molecules to pass through. The resulting water supply will be very similar to the purity of rainwater.

This state-of-the-art technology commonly used by desalinization plants to convert ocean water to drinking water will soon be used by the District to meet strict water quality objectives set by the Regional Water Quality Control Board. With the requirement to produce such exceptionally high quality recycled water, the District has developed plans to use the recycled water for the direct benefit of the community.

With the construction of the reverse osmosis facility, the District will be required to construct a new pipeline to dispose of the salts removed by the treatment system. The Yucaipa Valley Brineline will be a 15-mile pipeline that will connect to an existing brine disposal pipeline located in San Bernardino. Ultimately the brine solution created by the District, which is about 1/10th as salty as sea water, will be conveyed to the Orange County Sanitation District to be added to their ocean outfall.

Table 4-12: Recycled Water - Wastewater Collection and Treatment

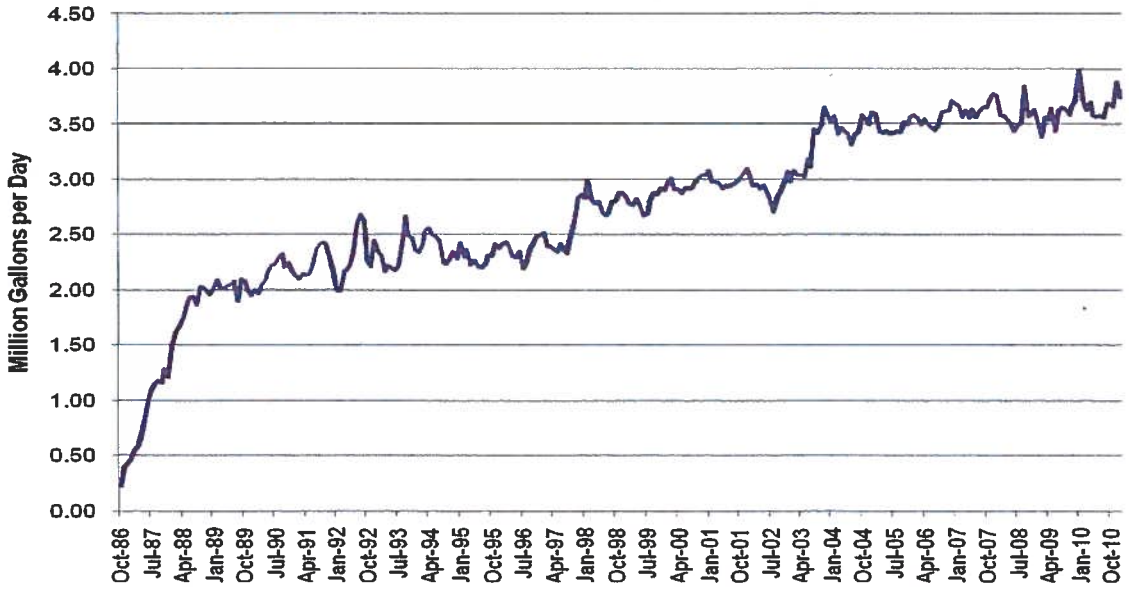
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035
Wastewater Collected and Treated to Advanced Tertiary in the Yucaipa Valley Water District Service Area	1,270	1,346	1,483	1,612	1,787	1,964	2,087
Percentage of Wastewater Collected that Meets Recycled Water Standard	100%	100%	100%	100%	100%	100%	100%
Volume of Water Disposed by Land Outfalls	657	657	657	657	657	657	657

Units in million gallons per year.

Describe the quantity of treated wastewater that meets recycled water standards, is being discharged and is otherwise available for use in a recycled water project (California Water Code Section 10633(b)).

The Yucaipa Valley Water District started treating wastewater in 1986. The sewer collection system has been expanded steadily over the years to provide additional recycled water supplies to the community.

Figure 4-17: Recycled Water Production History



The Yucaipa Valley Water District recently expanded the Wochholz Regional Water Recycling Facility to a 6.7 MGD wastewater treatment facility. The ultimate facility is expected to be capable of treating up to 10 million gallons per day of wastewater.

The Wochholz Regional Water Recycling Facility includes the following major components:

- Septage Receiving Station - A septage receiving facility provides septage haulers an efficient location to discharge septage wastes for treatment at the plant.

- Headworks Grit Removal System - The grit removal system has been recently upgraded and enlarged to increase grit removal efficiency and reduce the impacts of grit on downstream treatment processes.

- Primary Equalization Tank - The primary equalization tank provides the District with the ability to stabilize daily flow variations and hold additional wastewater during peak periods for a steady-state treatment flow throughout the treatment facility.

- Secondary Treatment System - The secondary treatment system has been equipped with nitrogen removal technology that is used to provide compliance with the total inorganic nitrogen limits of 6 mg/l.

- Advanced Tertiary Treatment Facilities - Equalized flows are treated with microfiltration technology commonly used in the beverage and drinking water industry. The recycled water product from this treatment process is significantly more pure than the tertiary filters previously used by the District. This treatment technology is a precursor to the reverse osmosis treatment that will be added to the treatment process.

- Recycled Water Storage Reservoir - A 4.0-MG recycled water storage reservoir and pump station is used to store the recycled water prior to plant effluent.

Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place and quantity of use (California Water Code Section 10633(c)).

Recycled water used in the service area of the Yucaipa Valley Water District is currently produced at the Yucaipa Valley Regional Water Filtration Facility. The Yucaipa Valley Water District will be constructing a pipeline, reservoir and booster station to complete the recycled water system to the Wochholz Regional Water Recycling Facility. When this facility is completed in January 2014, the Yucaipa Valley Water District will be capable of using recycled water to meet the irrigation demands within the service area.

Currently, recycled water produced from the Wochholz Regional Water Recycling Facility is discharged into San Timoteo Creek.

Table 4-13 – Recycled Water – Potential Future Use

User type	Description	Feasibility[1]	2015	2020	2025	2030	2035 - opt
Agricultural irrigation	Minimal agricultural land use in the YVWD service area	Most likely agricultural land use will decrease	5.217	5.365	5.294	5.337	5.318
Landscape irrigation[2]	City of Yucaipa receives recycled water to irrigate parks and schools	Recycled system will expand to additional areas	58.373	121.829	191.115	200.388	210.581
Commercial irrigation[3]	Business districts within YVWD service area	Recycled system will expand to additional areas	18.911	39.468	61.915	64.919	68.221
Golf course irrigation	Yucaipa Valley Golf Course receives recycled water	Recycled water irrigation on golf course sites will continue	Included in Landscape Irrigation				
Wildlife habitat	n/a	YVWD is required to discharge 1.6 mgd into San Timoteo Creek, effluent will be replaced with groundwater	0	0	0	0	0
Wetlands	n/a	n/a	0	0	0	0	0
Industrial reuse	n/a	n/a	0	0	0	0	0
Groundwater recharge	Recharge advanced tertiary treated wastewater	Groundwater recharge with recycled water will increase	1,483				
Seawater barrier	n/a	n/a	0	0	0	0	0
Geothermal/Energy	n/a	n/a	0	0	0	0	0
Indirect potable reuse	n/a	n/a	0	0	0	0	0
Other (Hydrant Flushing)	YVWD and Fire Department conduct periodic testing and flushing of hydrants	This activity will continue	8.739	18.240	28.613	30.002	31.528
Other	n/a	n/a	0	0	0	0	0
Total							

Units: Million Gallons
[1]Technical and economic feasibility.
[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)
[3]Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses. (California Water Code Section 10633(d)).

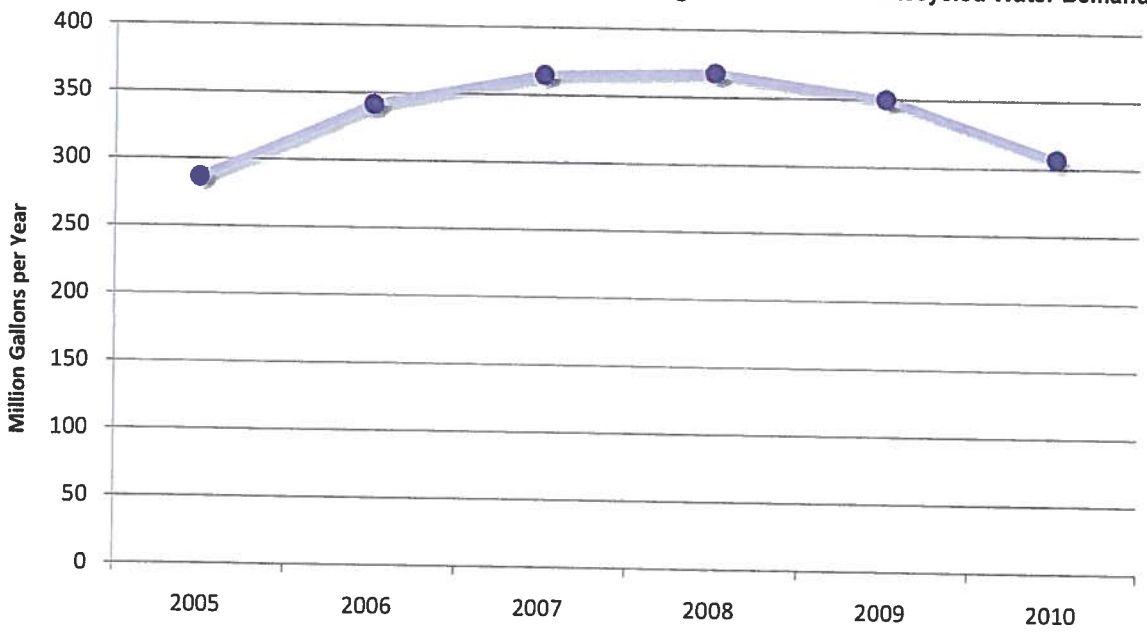
Currently, the District provides about 300-350 million gallons (920-1,075 acre feet) of recycled water per year. Since recycled water is used for irrigation purposes, the actual amount of recycled water fluctuates each year and is highly dependent on weather conditions.

Currently, the District meets our recycled water demands by treating the backwash water at the Yucaipa Valley Regional Water Filtration Facility. By 2013, the District will be adding another supply of recycled water to the Regional Conveyance System from the Wochholz Regional Water Recycling Facility. This source will contribute an additional 3.5 million gallons per day, or approximately 1,300 million gallons per year. As the Henry N. Wochholz Regional Water Recycling Facility (WRWRF) expands, the amount of recycled water generated from this facility will increase.

The WRWRF has a rated capacity of 6.67 mgd. Currently, treated effluent is conveyed through a land outfall and discharged to San Timoteo Creek. Three customers along the existing land outfall are receiving recycled water for irrigation purposes. Delivery amounts are expected to grow to about 6,700 acre-feet by 2020 or about 24 percent of total agency water demands. Ultimately, the District expects to deliver about 8,000 acre-feet per year of recycled water.

The potential exists for the District to increase the amount of water that is beneficially reused within the service area from the existing WRWRF facility. Additional environmental analysis on the potential impacts to San Timoteo Creek and surrounding areas is required before this can occur.

Figure 4-18 – Annual Recycled Water Demands



The Yucaipa Valley Water District is continuing to expand its non-potable water system to meet increasing demand in the system. The increasing demand is a result of additional golf courses, schools, community parks, and other non-potable water users, as well as increased residential development.

The existing (Phase I) non-potable water system went into operation in 2002, and currently makes use of two predominant water sources – including raw water from the State Water Project and local surface water from Mill Creek. Upon completion of the Phase II system improvements, the District will increase its recycled water supply by up to 8.0 million gallons per day of recycled water from the Henry N. Wochholz Regional Water Recycling Facility.

The District also plans the incorporation of seasonal storage into the overall system operation with the construction of a series of aquifer storage and recovery projects. The District will use both spreading basins and direct injection to address its seasonal storage needs. In the vicinity of the Wochholz Regional Water Recycling Facility, a series of aquifer storage and recovery wells will be constructed. In addition to these wells, the District will also have several spreading basins located throughout its service area for groundwater recharge with excess non-potable water. In the winter, when irrigation demands are low, the District will store excess recycled water from various water sources at its disposal, in the underlying groundwater basin. During high demand periods, groundwater recovery wells located adjacent to the Wochholz Regional Water Recycled Facility and various spreading basins will be used to supplement the system as additional recycled water supply.

The District also has several non-potable water wells throughout its service area that may also be used to recover stored water from the underlying groundwater basin. The recovered water supplies will be combined to serve the maximum day recycled water demand during high demand periods of the year.

In addition, the Yucaipa Valley Water District is currently conducting an environmental review to possibly extend the current Regional Recycled Water Conveyance System to the District's southernmost service area boundary. This extension would involve the construction of a 24" recycled water pipeline, approximately 18,500 linear feet (3.5 miles) through the City of Calimesa. The purpose of the pipeline is to provide recycled water service to customers within the District and provide surplus recycled water to neighboring water agencies such as the Beaumont Cherry Valley Water District and the City of Banning.

Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision (Public Water Code Section 10633(e)).

Table 4-14 - Recycled water — 2005 UWMP Use Projections Compared to 2010

Use type	2010 actual use	2005 Projection for 2010[1]
Agricultural irrigation	7.2	620.704
Landscape irrigation[2]	132.600	
Commercial irrigation[3]	10.000	
Golf course irrigation	166.400	
Wildlife habitat	1,277.500	584.000
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse		0
Total	1,586.500	1,204.704

Units of measurement are in million gallons
[1]From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.
[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)
[3]Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year (Public Water Code Section 10633(f)).

Recycled water is comprised of approximately 8% of Yucaipa Valley Water District's water portfolio as of 2010. Recycled water sources are expected to increase up to 30% of the total water sources utilized by the District by 2030. Financial incentives are provided to a recycled water customer. For example, under Yucaipa Valley Water District's current conservation pricing, a recycled water customer would pay approximately $0.20 - $1.20 less per one thousand gallons. However, this structure alone does not provide a measurable incentive to en

Table 4-15 – Methods to Encourage Recycled Water Use

	Projected Results					
Actions	2010	2015	2020	2025	2030	2035 - opt
Financial incentives	0	0	0	0	0	0
Total	0	0	0	0	0	0

Units of measurement are in million gallons

Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use (Public Water Code Section 10633(g)).

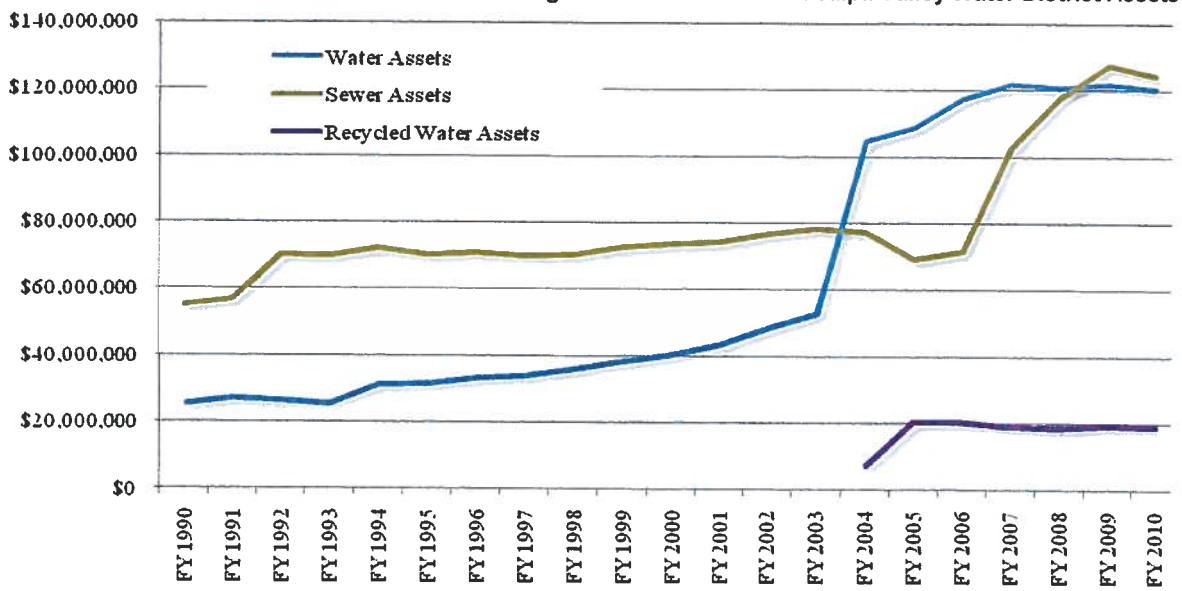
The Yucaipa Valley Water District is commuted to the construction of dual distribution facilities for potable water and recycled water.

4.9 Future Water Projects

Describe all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program (Public Water Code Section 10631(h)).

As shown below, the Yucaipa Valley Water District has been aggressively constructing a series of water and recycled water system improvements to ensure water supplies are available in drought years.

Figure 4-19 – Growth of Yucaipa Valley Water District Assets



Each year the Board of Directors adopts a series of projects to bolster the reliability of the water supply system. A copy of the District's Capital Improvement Budget is the best source of information for future water projects.

Section 5

Water Supply Reliability and Water Shortage Contingency Planning

5.1 Water Supply Reliability

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. (California Water Code Section 10620(f)).

The Yucaipa Valley is located in the upper portion of the Santa Ana Watershed, south of Mill Creek and the Santa Ana River. By not having a significant watercourse in our Valley, the local groundwater basins do not refill with precipitation and melting snowpack as quickly as or neighboring agencies that benefit from the surface water recharge of the Santa Ana River and Mill Creek.

For this reason, water supply is clearly one of the most critical issues facing the Yucaipa Valley. In the past, the area has relied heavily on local sources of surface and groundwater for our supply. Continued growth has caused the water demands to exceed the locally available supply. The Yucaipa Valley Water District recognizes that in order for development to occur, there must be a reliable source of water delivered to meet the new demands in addition to the existing demands and replenishment required to recover the previously depleted groundwater basins.

This section is dedicated to developing a methodology to protect current customers while allowing new development to occur. It is necessary to establish priorities for the limited imported water supplies available in the state to ensure the continued growth and prosperity of the community. While some may view the proposed methodology as punitive, others recognize that the intent is to develop a reasonable mechanism that provides certainty to new development in spite of the failing infrastructure our imported water is dependent upon.

5.1.1 A Diversified Portfolio

Just like an individual's financial investment portfolio, the Yucaipa Valley Water District maintains a diversified portfolio of available water resources as a strategy to maintain a reliable water supply for existing and future customers. Specifically, the District has access to the following water supplies to meet existing and future water demands:

- Unadjudicated Ground Water Supplies
  - Crafton Subbasin
  - Gateway Subbasin
  - Triple Falls Subbasin
  - Oak Glen Subbasin
  - Wilson Creek Subbasin
  - Calimesa Subbasin

  - Singleton Canyon Subbasin
  - San Timoteo Subbasin
  - Western Heights Subbasin
  - Wildwood Subbasin
- Adjudicated Groundwater Supplies
  - Beaumont Storage Unit
- Surface Water Supplies
  - Oak Glen Surface Water
- Supplemental Water Supplies – Direct Delivery
  - Yucaipa Valley Regional Water Filtration Facility
  - Yucaipa Source - San Bernardino Valley Municipal Water District
  - Calimesa Source - San Gorgonio Pass Water Agency
- Recycled Water Supplies
  - Henry N. Wochholz Regional Water Recycling Facility
- Non-Potable Water Supplies
  - Groundwater sources not suitable for drinking water

While the Yucaipa Valley Water District relies on a variety of water resources, the most significant sources of imported water from northern California has recently become less reliable. To ensure sufficient water supplies exist for new development, it is important to provide a clear roadmap for developers and builders to understand the process for demonstrating a guaranteed source of water prior to receiving a building permit for construction.

This section focuses on an implementation strategy to allow new development to occur without creating a negative impact to the existing community under wet, normal and dry year conditions.

5.1.2 Overview of Water Supply Assessments

On October 9, 2001 Governor Gray Davis signed into law Senate Bills 610 (Costa) and 221 (Kuehl) that require a water supply assessment in conjunction with development project reviews under the California Environmental Quality Act (CEQA), and a written verification of water supply where a development is proposed for approval.

Since the implementation of Senate Bills 610 and 221, the Yucaipa Valley water District has prepared and adopted a number of water supply assessments for various projects within our service area. While the Yucaipa Valley Water District and the developers worked closely to develop a thoughtful, credible and specific strategy for the developments, the plans were quickly outdated with some developments adding residential units following the adoption of the water supply assessments and other plans being subjected to changed conditions due to changes in the reliability of imported water from the State Water Project.

To resolve these issues, the Yucaipa Valley Water District has developed the Water Resource Validation Program to apply to all new development within our service area, not just developments with 500 or more units.

The Yucaipa Valley Water District has reviewed the latest requirements for water supply assessments and has determined that this program will provide a sufficient water supply to serve the needs of all new development during normal, single dry, and multiple dry water years

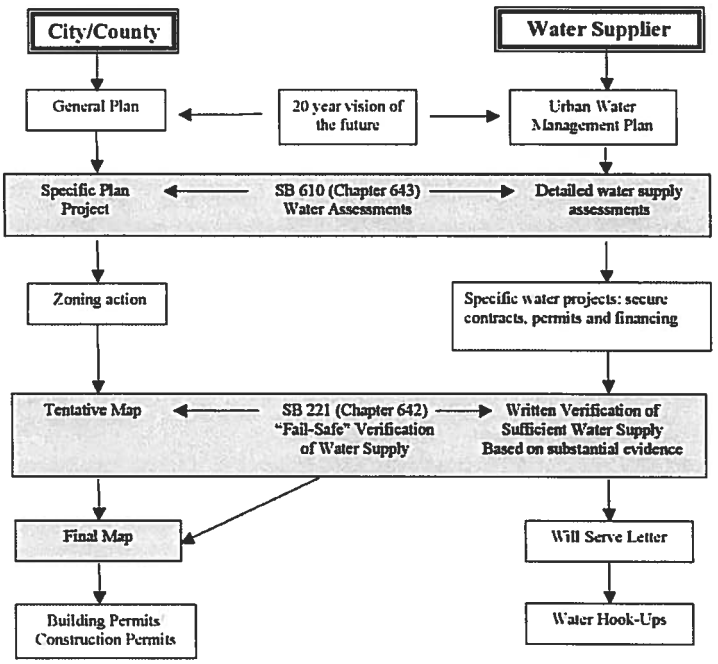
during a 20-year projection, in addition to existing and planned future uses, including agricultural and manufacturing uses.

5.1.2.1 Requirements of Senate Bill 221 and Senate Bill 610

The intent of Senate Bill 221 and Senate Bill 610 was to create additional assurance that certain new developments could be provided a reliable supply of water and that the effect of certain new developments upon existing water users both within the service area of the public water provider and those dependent on common sources of water were informed regarding the proposed water use, its impacts and plans to maintain reliable supplies. The legislation also serves to better inform decision makers regarding the water supply implications of development addressed by the measures.

The following chart illustrates the relationship between a local land use agency and the water supplier in their planning processes. The General Plan, prepared by a city or county planning department, and the Urban Water Management Plan prepared by a water supplier are the critical source documents used to substantiate the information required by Senate Bill 221 and Senate Bill 610 at the local level.

Figure 5-1 – Implementation of Senate Bill 610 and 221



Source: Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, California Department of Water Resources, October 8, 2003, page v.

Senate Bill 221

Senate Bill 221 creates a specific requirement for a written verification that a sufficient supply of water exists for any residential development of 500 or greater units as a condition of approval of a tentative tract or parcel map. Local land use approval authorities may not approve such maps if a sufficient supply cannot be demonstrated. Under the statute, a sufficient supply is defined as the total water supply available during normal, single dry and multiple dry years within a 20- year projection that will meet the water suppliers existing and planned future uses (Government Code 66473.7(a)(2). This does not mean that 100 percent of the development's unrestricted water demand must be met 100 percent of the time, nor does it mean the new development may not have any impact on the service level of existing customers. A "sufficient water supply" may be found to exist for a proposed subdivision and for existing customers, even where a drought-induced shortage will be

known to occur, as long as a minimum water supply can be estimated and planned for during a record drought (ACWA, 2002).

Senate Bill 610

Senate Bill 610 (Costa) became effective January 1, 2002. The stated intent of SB 610 is to strengthen the process by which local agencies determine the adequacy and sufficiency of current and future water supplies to meet current and future demands. SB 610 amended the California Public Resources Code to incorporate Water Code findings within the CEQA process for certain types of projects, amended the Water Code to broaden the types of information included in Urban Water Management Plans ((UWMP) – Water Code Section 10620 et. seq.) and added to Water Code Part 2.10 Water Supply Planning to Support Existing and Planned Future Uses (Section 10910 et. seq.). Part 2.10 clarifies the roles and responsibilities of the Lead Agency under CEQA and the "water supplier" with respect to describing current and future supplies compared to current and future demands.

Overall, Senate Bill 610 requires that a water supply assessment be prepared for certain developments, including residential developments in excess of 500 units, where an environmental impact report or negative declaration is being prepared under CEQA. The requirement is one that adds a specific water supply assessment protocol for land use jurisdictions to follow and consider in evaluating the environmental impacts for a proposed project. The Water Supply Assessment must be included in any CEQA document prepared for the project.

5.1.3 Water Requirements for New Development

The Yucaipa Valley Water District will require all new development to provide bundled water, sewer and recycled water services for all new construction. Bundled services are a critical component in order for the District to make a firm commitment of water for at least two decades. This requirement is further discussed below.

Overall, the Yucaipa Valley Water District's water facilities are designed to serve single family, multi-family, commercial and industrial properties. The water required to serve each type of land use is related to the water required to serve one single-family residence, referred to as one Equivalent Dwelling Unit (EDU). Every service connection is assigned an EDU based on meter size and historical consumption data. When meter sizes have not yet been determined, as for the commercial developments, parks, and schools, consumption is based on acreage and historical data for water use per acre. The total consumption per parcel is then converted to EDU's.

Water demand criteria for new development was updated by the Board of Directors and included as the basis for the most recently adopted Water Master Plan. Resolution No. 32-2002 set demand requirements for facility design as follows:

- Average Day Demand (gallons) = (Number of EDU's) x (700 gallons per day per EDU)
- Maximum Day Demand = 200% of Average Day Demand
- Peak Hour Demand = 400% of Average Day Demand

A key component within the 2005 Water Master Plan is the District's commitment to utilizing recycled water. The Board of Director's have adopted a policy stating "...recycled or other non-

potable water be used, for any purpose approved for non-domestic water use, to the maximum extent possible." Use of recycled water will have the following direct benefits:

- Reduced dependency on high quality ground water;
- Preservation of ground water supplies for potable use;
- Reduced dependency on imported water from Northern California; and
- Reduced operating cost of the Yucaipa Valley Regional Water Filtration Facility.

Table 5-1 - Dual Plumbed Home Water Allocation for a Typical Residential Dwelling Unit

Water Type	Percentage of Total Demand	Gallons per Day (per EDU)
Potable Water	40%	280
Non-Potable Water	60%	420
Total Water Demand	100%	700

Based on this policy, all new developments with recycled water accessible will be required to connect to recycled water infrastructure to irrigate all greenbelt areas, commercial landscape areas, roadway medians, front yards of individual homes and rear yards of individual homes. The benefits to the development include:

- An additional highly reliable, drought tolerant water source; and
- Reduction in the Yucaipa Valley Regional Water Filtration Facility Development Impact Fees.

Based on analyses of similar dual plumbed water systems in other water agencies, the potable water demand for a standard residential home will be estimated at 40% of the regular total water demand, reduced by 60% through the use of non-potable water for outside irrigation. Therefore, potable water facilities will be reduced from the District's standard design criteria of 700 gallons of total water per day per EDU to 280 gallons of potable water per day per residential EDU.

Based on an analysis of similar dual plumbed water systems in other water agencies, the non-potable water demand makes up approximately 60% of the total residential water demand. Therefore, non-potable facilities will generally be sized at 420 gallons per day per residential EDU.

Table 5-2 - Water Demand Analysis for a Typical Residential Dwelling Unit

Water Demand	Gallons (per EDU)	Acre Feet (per EDU)
Total water demand for one day	700	0.00215
Total water demand for one year	255,500	0.784
Total water demand for twenty years	5,100,000	15.68

The total water demand for a standard residential unit (EDU) will require over five million gallons of water (5,100,000 gallons) per unit over a twenty year period. Considering the quantity of water needed for each new home, the Board of Directors has recognized the need to implement the Water Resource Validation Program for each new unit of residential, commercial, institutional, and industrial development.

Crystal Status Development Program

With the implementation of the Crystal Status Development Program, the Yucaipa Valley Water District (or District) will have sufficient water supplies to meet the needs of existing and future customers within our service area. Specifically, this program will provide sufficient water supplies to serve the needs of all new development during normal, single dry, and multiple dry water years during a 20-year period, in addition to existing and planned future uses, including agricultural and manufacturing uses.

The Crystal Status Development Program will rely upon the use of several groundwater basins currently under the management and control of the Yucaipa Valley Water District and our neighboring water providers to ensure a sufficient water supply exists for existing customers and new development. The intent of the Program is to provide the development community with a water supply that is credible, reliable, and robust such to minimize challenges while ensuring existing customers are not adversely impacted by the demand for water by new development.

5.2 Water Supply Reliability Strategy

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable (California Water Code Section 106319(c)(2))

Through build-out, Yucaipa Valley Water District will provide a reliable supply of water to serve the community, despite rapidly growing water demands. This will be accomplished by prioritizing the importation of water based on availability in the following order:

- Priority One – Direct Delivery for Existing Customers. The direct delivery of imported water to meet the needs of existing potable water and non-potable water demands will be the highest priority of the District. This priority ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the existing direct delivery demand, imported water will be allocated to the next priority.

- Priority Two – Groundwater Adjudication Obligations. The District is responsible for meeting the obligations of groundwater adjudications in the Beaumont and Yucaipa Basins. This is the second highest priority to ensure sufficient storage and replenishment obligations under court orders have been achieved. This priority also ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the first and second priorities, imported water will be allocated to the following priority.

- Priority Three – Groundwater Banking for Future Reliability. The Board of Directors will establish a groundwater banking of 15% of the total water used by District customers to recover our groundwater basins for future reliability. Each month, customers will be charged the cost for importing an additional 15% of the water consumed. The water will be stored in the groundwater basins to establish a credit and future drinking water supply to allow the community to use this local source during times of droughts and disruptions to the State Water Project. As with the first two priorities, this third priority also ensures

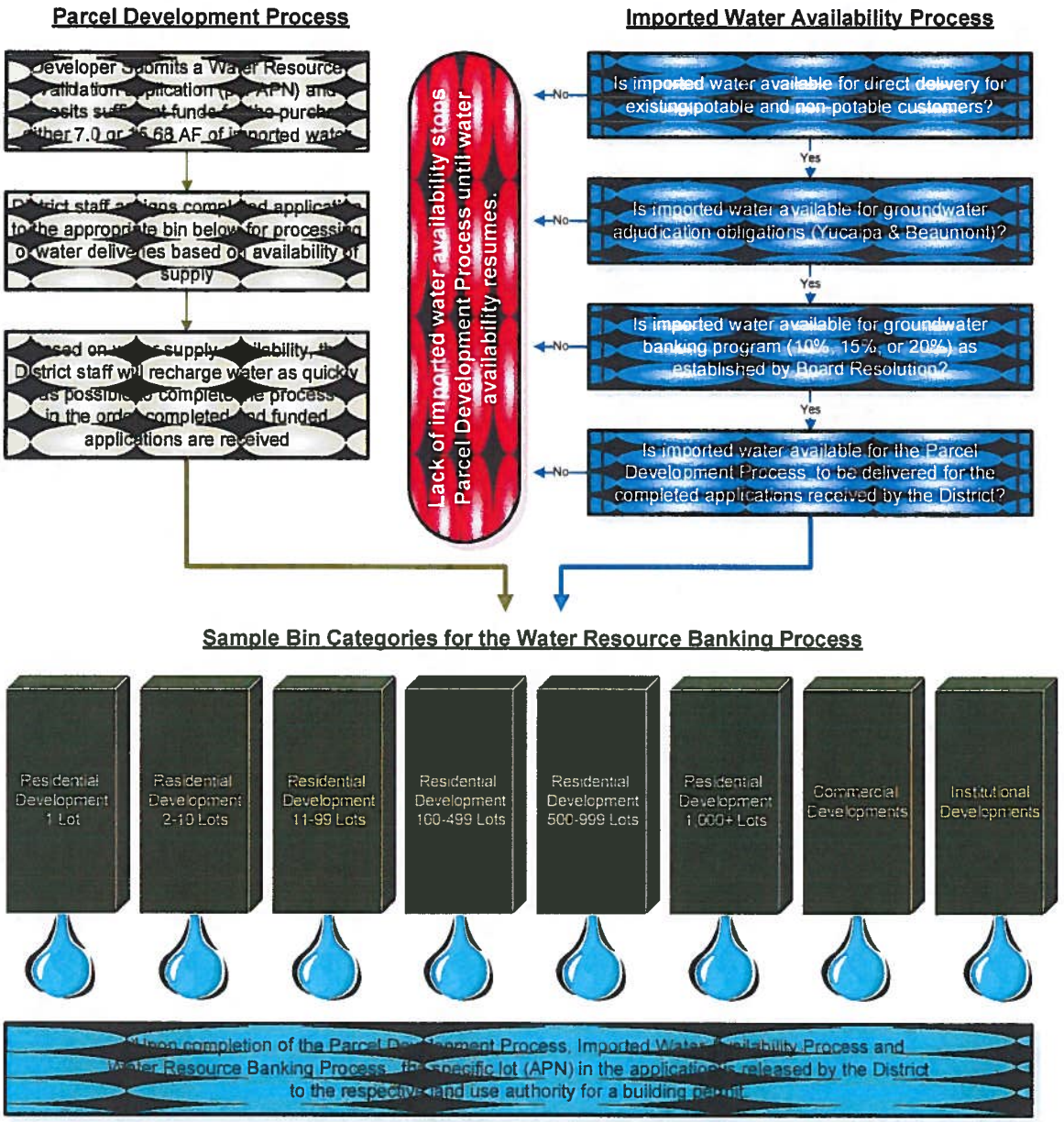
sufficient water supply is allocated to meet current water demands, and is different from the Parcel Development Process needed for new development to occur. If the available supply of imported water exceeds the first, second and third priorities, imported water will be allocated to the following priority.

- Priority Four – Parcel Development Process. The Parcel Development Process provides for the storage of 7.0 acre-feet per EDU for all new developments and 15.68 acre feet per EDU of imported water for the Crystal Status Development Program. This water is sufficient to clearly demonstrate a 20-year supply of water is available for the development to occur. The cost of imported supplemental water will be linked directly to the availability and anticipated cost for water delivered by either the San Bernardino Valley Municipal Water District or the San Gorgonio Pass Water Agency as established by the Yucaipa Valley Water District.

Based on this strategy, new development will contribute to the capital assets of the Yucaipa Valley Water District as well as the water supply strategy to ensure a long-term and reliable water supply is available. This strategy allows the Yucaipa Valley Water District to serve its customer's water demands entirely through groundwater or surface water allowing the District to insulate itself from periodic drought by utilizing available surface waters in wetter years relying more on groundwater in dryer years when surface water is less available. The District is able to switch between the two sources, or use both sources simultaneously, depending on hydrology and water availability.

Surface supply availability from the SWP, San Bernardino Basin Bunker Hill Pressure Zone, Seven Oaks Dam, Mill Creek and Santa Ana River can be used interchangeably, depending upon local and statewide hydrology, to supplement a stable local groundwater yield. Additionally, the District will incorporate recycled water delivery systems into new development, focusing service of new irrigation demands on recycled water. Recycled water will give the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of total supply.

Figure 5-2 – Yucaipa Valley Water District Building Permit Procedure



5.3 Supply and Demand Comparisons

The UWMP Act requires urban water suppliers assess water supply reliability by comparing total projected water use with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment of single-dry year and multiple-dry years. This section presents the reliability assessment for the Yucaipa Valley Water District's service area.

Table 5-3 - Local Surface Water Supplies – Normal, Single-Dry, and Multiple Dry Years

Surface Water	2015	2020	2025	2030	2035
Normal Year - Oak Glen Creek	114	114	114	114	114
Single Dry Year Oak Glen	57	57	57	57	57
Multiple-Dry Year Oak Glen	57	57	57	57	57
Total Local Surface Supplies, Normal, Single and Multiple Dry Years	228	228	228	228	228

Table 5-4- Minimum Water Supply Available During Next Three Water Years (AFY)

Minimum Water Supply	2011	2012	2013
Purchased Imported Water	1,630	1,630	1,630
Groundwater	3,749	3,749	3,749
Surface Water	57	57	57
Transfers/Exchanges	0	0	0
Recycled Water	1,483	1,483	1,483
Total Supply	6,919	6,919	6,919

5.3.1 Normal Water Year

The normal or average water year is a year in the historical sequence that most closely represents median runoff levels and patterns. This section summarizes The Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during an average/normal year and compares them to demands for the same period.

In the table below, demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. This information demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under normal conditions.

Table 5-5 Projected Average/Normal Year Supplies and Demands

	2015	2020	2025	2030	2035
Existing Supplies					
Wholesale Imported	3,159.592	3,438.322	3,761.714	4,095.864	4,508.254
Groundwater	3,944.600	4,727.000	4,727.000	4,727.000	4,727.000
Local Surface Water	114.100	114.100	114.100	114.100	114.100
Recycled Water	1,483.300	1,612.396	1,787.458	1,964.476	2,087.378
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Existing Supplies	8,701.592	9,891.818	10,390.272	10,901.440	11,436.732
Planned Supplies					
Wholesale Imported	0.000	0.000	0.000	0.000	0.000
Groundwater	0.000	521.600	1,043.200	1,043.200	1,043.200
Local Surface Water	0.000	0.000	0.000	0.000	0.000
Recycled Water	0.000	0.000	0.000	0.000	0.000
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Planned Supplies	*0.000*	521.600	1,043.200	1,043.200	1,043.200
Total Existing and Planned Supplies	**8,701.592**	**10,413.418**	**11,433.472**	**11,944.640**	**12,479.932**
Demands without Additional Conservation	6,789.928	7,093.760	7,414.544	7,707.618	7,971.678
Conservation	678.993	1,418.752	1,482.909	1,541.524	1,594.336
Total Adjusted Demands	6,110.935	5,675.008	5,931.635	6,166.094	6,377.342
Surplus/Deficit in Single-Dry Year	2,590.657	4,738.410	5,501.837	5,778.546	6,102.590
Difference as % of Supply	30%	46%	48%	48%	49%
Difference as % of Demand	42%	83%	93%	94%	96%

Units in Million Gallons

5.3.2 Single-Dry Year

The single-dry year is generally the lowest annual runoff for a water source in the record. The single-dry year may differ for various sources.

This section summarizes the Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during a single-dry year and compares them to demands for the same period. In the table below, demands are assumed to be 10 percent greater in a single-dry year than during a normal year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions.

This table demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under single-dry year conditions.

Table 5-6 Projected Single Dry Year Supplies and Demands

	2015	2020	2025	2030	2035
Existing Supplies					
Wholesale Imported	1,630.000	1,630.000	1,630.000	1,630.000	1,630.000
Groundwater	3,749.000	3,749.000	4,792.200	4,792.200	4,792.200
Local Surface Water	57.050	57.050	57.050	57.050	57.050
Recycled Water	1,483.300	1,612.396	1,787.458	1,964.476	2,087.378
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Existing Supplies	6,919.350	7,048.446	8,266.708	8,443.726	8,566.628
Planned Supplies					
Wholesale Imported	0	0	0	0	0
Groundwater	0.000	521.600	1,043.200	1,043.200	1,043.200
Local Surface Water	0	0	0	0	0
Recycled Water	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0
Total Planned Supplies	*0.000*	521.600	1,043.200	1,043.200	1,043.200
Total Existing and Planned Supplies	**6,919.350**	**7,570.046**	**8,266.708**	**8,443.726**	**8,566.628**
Demands without Additional Conservation	7,468.986	7,803.136	8,155.868	8,478.282	8,768.748
Conservation	746.899	1,560.627	1,631.174	1,695.656	1,753.750
Total Adjusted Demands	6,722.087	6,242.509	6,524.694	6,782.626	7,014.998
Surplus/Deficit in Single-Dry Year	197.263	1,327.537	1,742.014	1,661.100	1,551.630
Difference as % of Supply	3%	18%	21%	20%	18%
Difference as % of Demand	3%	21%	27%	24%	22%

Units in Million Gallons

5.3.3 Multiple-Dry Years

The multiple-dry year is generally the lowest annual runoff for a three year or more consecutive period. The multiple-dry year period may differ for various sources.

This section summarizes the Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during a multiple-dry year period and compares them to demands for the same time frame. In the table below, demands are assumed to be 10 percent greater in a multiple-dry year than during an average year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions.

This table demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under multiple-dry year conditions.

Table 5-7 Projected Multiple-Dry Year Supplies and Demands

		2015	2020	2025	2030	2035
Multiple-Dry Year First Year Supply	Supply Totals[a]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[b]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%
Multiple-Dry Year Second Year Supply	Supply Totals[a]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[b]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%
Multiple-Dry Year Third Year Supply	Supply Totals[a]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[b]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%

Units in Million Gallons

5.4 Water Shortage Contingency Planning

Water conservation is more than just restricting water use. Water conservation is the efficient use of water through conservation measures and increased efficiency. Implementing water conservation allows water utilities to avoid the cost of building additional drinking water facilities and reasonably expands the use of water resources. Water conservation is one of the last options available for communities to continue the long tradition in America of cheap, available water. Inexpensive and readily available water supplies are often taken for granted while in many parts of the world this luxury is unique.

> *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster (California Water Code Section 10632(c))*

The objective of Water Shortage Contingency Planning is to establish actions and procedures for managing water supply and demands during water shortages. The plan would help the District maintain essential public health and safety and minimize adverse impacts on economic activity, environmental resources and the region's lifestyle.

This plan complements the District's Emergency Response Plan. That plan is an emergency plan that defines decision making authority in emergencies and creates specific emergency action plans for a number of systems, security, and management procedures.

As part of the Emergency Response Plan, the District would provide a unified incident command center as a disaster response command team at the Administration Building. These team leaders will determine policies and strategies for handling major disasters. Individual departments, working on a common incident, will coordinate their field efforts through the incident command structure.

While water supply disruptions can occur for a variety of reasons, a weather related water shortage, or drought, is one category of particular importance to the Yucaipa Valley Water District for reasons described below. Droughts are naturally occurring but unpredictable weather events of varying frequency, duration and severity. In the Yucaipa Valley, historical data indicates a high probability of short term and/or multi-year drought conditions.

This region is generally faced with a relatively dry summer period with very little rainfall occurring during the summer months. Most of the annual 16 inches of precipitation occurs during the fall and winter months from November to April, with most of the rainfall occurring in February. Since the Yucaipa Valley Water District is typically reliant on local surface water and groundwater, the amount of precipitation received in the Yucaipa Valley is extremely important to recharge our underground water basins. Certain weather events that can affect this cycle may manifest in one or more of the following ways:

- Less than normal winter precipitation and snowpack in the Yucaipa Valley, this would limit the quantity of water available at the Oak Glen Surface Water Filtration Facility and ultimately reduce the amount of groundwater recharge.
- Unusually warm spring weather bringing with it early melting of the snowpack, resulting in early drawdown of the mountain resources.
- Unusually hot and dry summer weather, which can significantly increase peak season demands.
- A delayed return of the fall rains, or a dry winter, which can delay the fall percolation refill cycle (which replenishes the underground storage reservoirs after the peak season).

Yucaipa Valley Water District's strategy for dealing with the hydrologic uncertainty associated with drought management and related emergency issues involve several components:

- **Information** - To deal with hydrologic uncertainty in real-time and in longer term planning horizons, the District's management team uses a number of available informational and data gathering sources. One of the most valuable resources used by the District is the California Department of Water Resources Data Exchange Center. This center provides real time data at the California Department of Forestry Fire Station located on Highway 38.

- **Forecasting** - Through the National Oceanic and Atmospheric Administration (NOAA), the District regularly monitors daily weather forecasts, mid-range weather forecasts, 30- and 90-day and multi-season climate outlooks. The Internet has greatly improved access to these sources of information. For example, NOAA's El Niño Theme Page on the Internet provides a wealth of timely information on current and forecasted El Niño and La Niña conditions with enough lead time for the District to prepare for such events.

- **Communication** - The District's management team works closely with members of other local, state, and federal agencies including the City of Yucaipa, City of Calimesa, County of San Bernardino, County of Riverside, U.S. Army Corps of Engineers. The local agencies meet once a month to discuss several issues related to the Yucaipa Valley,

including hydrologic conditions, facility and system operations, and other subjects as may be beneficial in managing our water supplies.

- **Dynamic operating rules** - Operational flexibility is key, with operating plans changing as conditions and forecasts change. Dynamic groundwater pumping and reservoir storage settings are continuously monitored and modified to best fit the daily temperature forecasts. All of the tools, information sources and communications outlined above, are needed for coordinating and decision making related to real-time operations.

5.4.1 Principles of the Water Conservation Strategy

The Yucaipa Valley Water District's Water Conservation Implementation Plan, is based on the following principles:

- Given clear, timely and specific information on supply conditions and the necessary actions to forestall worsening conditions, customers prefer the opportunity to meet targeted demand reduction levels through voluntary compliance measures. The decision to move to mandatory restrictions is more acceptable if the voluntary approach has been tried first but has not resulted in enough demand reduction to ensure public health and safety through the projected duration of the shortage.

- Each drought or other shortage situation has enough unique characteristics that a plan cannot specifically define all the scenarios and specific supply and demand management actions. The usefulness of a Water Conservation Implementation Plan lies in planning the range of supply and demand management actions in advance of the situation, and in defining the communication mechanisms by which decisions will be made during the event.

- Given the effective long-term conservation program operated by the District, it is important to distinguish between the short term curtailment measures necessitated by a water supply disruption, and the conservation measures YVWD promotes to its customers. Conservation focuses on efficiencies, which do not affect the quality of life, whereas curtailment measures can involve short-term actions, which could impact it.

- It is essential to closely monitor water quality during a supply disruption and particularly during a warm weather drought. Water quality issues must be considered when supply management decisions are made.

5.4.2 Alternative Water Supplies

Depending on the nature and timing of a potential water shortage, alternative water supplies may be useful to supplement existing supplies.

- **Interties** - Since water supply disruptions may not affect all water suppliers to the same extent, it is sometimes feasible for the District to obtain water from other providers through interties, where they exist.

- **Recycled Water** – Yucaipa Valley Water District recognizes the value of recycled water as a means to conserve and extend the useful life of the potable water supply. Recycled

water is the use of highly treated effluent instead of potable water for irrigation, street washing, construction purposes, etc. in order to reduce demand for potable water and lessen the impact of shortages on the community. It is important to note, that as recycled water becomes more widely available through the District's proposed recycled water facilities, the District will rely more heavily on it as a back-up supply for non-potable uses.

5.4.3 Phased Curtailment Plan

This plan provides four stages of response based of increasing severity, as progressively more serious conditions warrant. This type of response would be appropriate to a summer drought or other long-range disruption. The four stages include a variety of communications, internal operations, and supply and demand management strategies as appropriate, and are characterized as follows:

- **Advisory Stage** -The public is informed as early as meaningful data are available that a possible shortage may occur.

- **Voluntary Stage** - If supply conditions worsen, the plan moves to the Voluntary Stage, which relies on voluntary cooperation and support of customers to meet target consumption goals. During this stage, specific voluntary actions are suggested for both residential and commercial customers.

- **Mandatory Stage** - If the Voluntary Stage does not result in the reduction needed, the Mandatory Stage prohibits or limits certain actions. This stage would be accompanied by an enforcement plan, which could include fines for repeated violation.

- **Emergency Curtailment** - This addresses the most severe need for demand reduction and could include a combination of mandatory measures and rate surcharges. This could be used as the last stage of a progressive situation, such as a drought of increasing severity, or to address an immediate crisis, such as a facility failure.

Recommendations about implementing the Water Conservation Implementation Plan would be made to the General Manager, based upon recommendations by District staff. The General Manager would then inform the members of the Board of actions taken or approval to implement specific strategies depending upon the severity of the situation. Prior to making a recommendation, the District staff would consider the following factors in making its recommendations:

- Total supply availability, including groundwater, interties, and other available water supplies;
- The rate of decline in total reservoir storage compared with the normal operating rule curve;
- Short and long term weather forecasts by the NOAA National Weather Service;
- Computer modeling of weather and demand assumption data;
- The trends and forecasts of the system's daily water demands;
- The estimated margin of safety provided by the demand reduction, compared with the level of risk assumed if no action is taken;
- The value of lost water sales revenue compared with the increased margin of reliability;

- The length of time between stage changes (abrupt starts and stops are to be avoided), and required time lags to shift administrative gears and institute program (printing, purchasing, etc.);
- Current events;
- Customer response.

ADVISORY STAGE

Objectives

- To prepare the cities, school district, developers and water users for potential water shortage thereby allowing all parties adequate planning and coordination time.
- To undertake supply management actions that forestalls or minimizes the need later for more stringent demand or supply management actions.

Triggers

- As presented earlier, there are a variety of weather and other conditions that may cause concern about water availability and a potential water shortage. The most fundamental weather condition that would trigger an "Advisory" would be when the winter season rainfall total is significantly less than the average annual rainfall of 18 inches per year for Yucaipa (as measured at the Mill Creek CDF Fire Station).
- The Advisory would be withdrawn when projected water supplies such as State Water Project water and/or recycled water are in sufficient supply to provide normal water supply conditions to the District's customers.

Public Message

- "The potential exists for lower than normal supply; conditions may return to normal or, later on, we may need to reduce consumption. We'll keep you informed."

Advisory Stage Goal

- Voluntary conservation measures resulting in a 5% - 10% reduction in water use, which can generally be achieved by reducing residential landscaping, and irrigation use.

Advisory Stage Action Plan

- Brief elected officials
- District staff to issue a water conservation press release/newsletter during the summer months as a reminder to customers. See the sample press release as provided in Attachment "A".
- District adds text to monthly billing to remind customers of water conservation practices. An example would be:
- "During the summer months, please remember not to water between the hours of 10:00am and 8:00 pm. Thank you for conserving".
- District staff to regulate construction meter activity. This may include restricting quantity of water used and the issuance of new construction meters.
- District staff to monitor and record potable water irrigation practices at golf courses, parks and schools to effectively regulate the use of limited potable supplies.

- District staff to encourage the use of recycled water as a means to remain drought tolerant and promote continuous water conservation measures.
- Weekly planning meetings to include updates on water supply issues and alternatives to prepare for the next stage of the implementation plan.
- Intensify ongoing media education effort about the water system, particularly relationship of weather patterns to supply and demand; provide up to date data and implications for water use, if known.

YVWD Internal Operations for Advisory Stage

- Prepare to establish purveyor "hotline", a frequently updated recording providing latest information and supply and demand data.
- Consult with other major customer groups, e.g., parks departments, landscape industry, forming a committee if needed, to assist the shortage advisory group to define message and provide feedback on utility actions.
- Initiate status report to entities with special interests, e.g., large water users especially landscape and nursery industry, parks, major water using industries.
- Prepare public information materials explaining the Water Conservation Implementation Plan stages and range of actions; prepare "Questions and Answers" for all customer groups, including those who may be planning new landscaping projects.
- Intensify coordination with other regional water suppliers to learn what conditions they are projecting for their systems.
- Evaluate ability, resources, and plans to move into Voluntary stage; as appropriate, begin preparatory measures.
- Intensify data collection actions (storage reservoirs, wells and power supply) and monitoring weather forecasts.
- Intensify the District's computer modeling runs of projected supply, storage and demand scenarios.
- Intensify supply side management techniques to optimize existing sources.

- Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- Assess water quality in reservoirs and distribution system to target for correction areas that may be predicted to experience problems.
- Initiate planning and preparation for Voluntary Stage actions, including an assessment of potential staffing impacts, training needs, and communications strategies including use of web-based information

VOLUNTARY STAGE

Objectives

- To maintain or reduce demand to meet target consumption levels by customer voluntary actions.
- To forestall or minimize need later for more stringent demand or supply management actions
- To minimize the disruption to customers' lives and businesses while meeting target consumption goals

- To maintain the highest water quality standards throughout the shortage.

Triggers

- The "Voluntary Stage" is implemented when one or both of the following factors applies:
  - Supply conditions identified in the Advisory Stage have not improved.
  - Demand levels indicate the need for a more systematic response to manage the situation
- Heavy groundwater pumping coupled with higher summer temperatures means that there might be an increased likelihood that water quality problems may become an issue. Consideration will be given to potential water quality issues in defining the supply and demand management strategies.

Public Message

"We are relying on support and cooperation of all water users to stretch the available water supply. Demand needs to be reduced by 10-15%. Customers are responsible for determining how they will meet that goal. Water waste is not allowed. If everyone cooperates, we may avoid imposing more stringent restrictions."

Voluntary Stage Goal

At this stage, the goal would be to achieve a 10% - 15% reduction in water use. Customers can generally achieve this goal through constant water conservation practices.

Voluntary Stage Action Plan

The District staff shall meet frequently to re-evaluate the situation based on current and projected supply conditions and the season, and determine the appropriate actions and strategies. The staff will determine target consumption goals to be achieved on a voluntary basis, which may be revised as necessary. (See attachment B) Based on the consumption goal, some or all of the following actions will be taken; those actions that are asterisked (*) will be considered initially for implementation if demand reductions more than 10 to 15 percent below normal are necessitated, or later if voluntary measures implemented fail to deliver targeted savings.

- Establish systematic communications with elected officials at the committee and Board level to communicate the nature and scope of voluntary measures and strategy
- District staff to evaluate whether targeted consumption levels and supply conditions warrant a rate surcharge to reinforce voluntary actions and/or to recover revenue losses*; the General Manager makes recommendation to Board members
- Prepare appropriate legislation regarding emergency surcharges, if required
- Consult with customer groups throughout the shortage to help develop public information messages and materials and to obtain feedback on utility actions
- Initiate major public information, media and advertising campaign:
  - In daily newspapers, publish and promote consumption graph that displays the goal and previous 24 hour consumption;
  - Promote consumption goals for typical households, and a percentage reduction goal for commercial customers (Attachment C contains a list of recommended actions for customers to take to reduce consumption)

- Develop and implement a marketing plan, including paid advertising, to keep customers informed about supply and demand conditions; reinforces desired customer actions; recommends customer actions to reduce demand sufficiently; and, depending on conditions, reminds customers that if goals are not achieved, restrictions may be necessary

- Identify what potential next steps will be to reduce demand including timing, what type of restrictions and/or surcharges will be imposed.
- Establish routine timing for press releases (e.g., every Monday morning) that provide current status and outlook; present information in standardized format that becomes familiar to media and public.
- Include water quality information in public information so that if flushing is necessary, the public understands that it is essential for water quality maintenance.
- Publicize the water supply conditions web page, which is updated regularly. Ensure the information provided covers the needs of all key interests: the public, news media and purveyors.
- Meet with landscape industry representatives to inform them of current and projected conditions; develop partnership programs and informational materials on the shortage, consumption goals, etc. for distribution by industry and utilities.
- Establish and promote "hotlines" for customers to obtain additional conservation information.
- Contact largest customers to request percentage reduction. Contact City and other public agencies to inform them of conditions and request their cooperation.
- Prepare list of commercial car wash facilities that recycle water
- Establish regular communication mechanism to keep Department employees, especially utility account representatives and water service consultants, up to date on goals, conditions, and actions
- Print generic postcards to acknowledge receipt of customer correspondence regarding the shortage and to inform customer that specific response is being prepared
- Initiate remaining planning and preparation for Mandatory Stage

YVWD Internal Operations for Voluntary Stage

- Continue actions listed in the Advisory Stage.
- Eliminate all operating system water uses determined not to be essential to maintain water quality such as pipeline flushing, reservoir overflows; complete cleaning of any reservoirs known to be vulnerable to warm weather taste and odor concerns.
- Increase water quality monitoring actions.
- Implement staffing reassignments as needed, and plan staffing changes, which may be needed for the Mandatory Stage, including staff to enforce mandatory restrictions.

Supply and Demand Management Actions

- Issue a request that non-recirculating fountains be turned off*
- Restrict construction meters to only essential purposes*
- Activate any existing interties to increase supply availability*
- Request that Fire Department limit training exercises that use water
- Request that City agencies eliminate washing fleet vehicles unless recycling car washes are used

- Request that hosing sidewalks, driveways, parking lots, etc. be limited to situations that require it for public health and safety
- Have YVWD field personnel "tag" observed obvious water waste such as hoses without shutoff nozzles, gutter flooding, etc. with notice that informs customer about the supply conditions and need to conserve
- Evaluate ability to accelerate or enhance or expand long term conservation programs; implement as appropriate

MANDATORY STAGE

Objectives

- To achieve targeted consumption reduction goals by restricting defined water uses.
- To ensure that adequate water supply will be available during the duration of the situation to protect public health and safety
- To minimize the disruption to customers' lives and businesses while meeting target consumption goals.
- To maintain the highest water quality standards throughout the shortage.
- To promote equity amongst customers by establishing clear restrictions that affect all customers

Triggers

The General Manager, with approval from the Board of Directors, would approve progression to this stage if goals established in the Advisory and Voluntary Stage have not been met, and additional action is needed. The specific restrictions imposed during the mandatory stage would be determined based on the season of the year, targeted demand levels, and other considerations previously mentioned. Variations of the specific restrictions may be applied based on water supply conditions. For example, lawn watering restrictions may simply consist of time of day restrictions; or, if conditions warrant, lawn watering could be restricted to certain times of day and allowed only once a week.

Public Message

"It is necessary to impose mandatory restrictions to reduce demand based on the current water shortage. We are continuing to rely on the support and cooperation of the public to comply with these restrictions but need the certainty and predictability of restricting certain water uses in order to ensure that throughout the duration of this shortage an adequate supply of water is maintained for public health and safety."

Mandatory Stage Goal

Mandatory conservation measures resulting in a 10% - 15% reduction in water use.

Mandatory Stage Action Plan

- The District staff will make recommendations regarding the nature, scope and timing of restrictions to the members of the Water Conservation Committee. The District staff will need to determine that the water supply and demand management strategies will not result in unacceptable water quality degradation.
- The General Manager recommends to the Board of Directors to implement the Mandatory Stage conservation measures and other appropriate actions.

- The Board adopts a resolution on mandatory restrictions and, if needed and not already in place, emergency surcharges.
- The public is informed about the nature and scope of the mandatory restrictions through a press conference, paid advertising and other means, including direct mail.
- The enforcement mechanisms, rate surcharges, target consumption goals, projections for how long restrictions will be in place and the reasons for imposing restrictions will also be identified, as will the possible consequences if goals are not met.
- Any exemptions from restrictions will be clearly identified.
- In communicating mandatory restrictions to the public, a clear distinction will be made between lawn/turf watering and watering gardens and ornamental plantings. The type and amount of watering allowed will be clearly defined.
- A "Customer Hotline" will be set up to report violations of restrictions.
- Customers who irrigate with private wells will be urged to install signs to let the public know that private well water is being used.
- Communication actions from the Advisory and Voluntary stages will be continued and enhanced.
- Plans will be made to move into the fourth stage - Emergency Curtailment - and to begin preparatory measures as appropriate

YVWD Internal Operation Plan for Mandatory Stage

- Continue appropriate actions from previous stages
- Finalize and implement procedures for exemptions from restrictions and/or emergency surcharges.
- Finalize and implement enforcement procedures for restrictions including highly visible "Water Watchers". (See Attachment __)
- Increase water quality monitoring actions at storage reservoirs.

Supply and Demand Management Actions

Overall supply conditions will be considered at regular meetings by District staff and the members of the water conservation committee in evaluating which restrictions to impose.

POSSIBLE WATER CONSERVATION RESTRICTIONS

Watering Restrictions

The following are several possible approaches to watering restrictions. The nature of the restrictions used will depend on the situation, and may change as severity of the situation changes.

- Prohibit all watering during the day, for example between 6:00 a.m. and 9:00 p.m.
- Limit all watering to a specific number of days per week or per month. This choice will depend on target consumption goals, the time of year and the extent to which watering is occurring, and how much demands have already decreased.

Other Restrictions

- Prohibit use of any ornamental fountain using drinking water for operation or make-up.
- Prohibit car washing except at commercial car wash facilities that recycle water.
- Rescind water construction meter hydrant permits.

- Prohibit washing of sidewalks, streets, decks or driveways, except as necessary for public health and safety.
- Limit pressure washing of buildings to situations that require it as part of scheduled building rehabilitation project (e.g., painting).
- Prohibit water waste including untended hoses without shut-off nozzles, obvious leaks and water running to waste such as gutter flooding and sprinklers/irrigation whose spray pattern unnecessarily and significantly hits paved areas

Exemptions from Water Use Restrictions

- **Lawn Watering Ban Exemption** - Newly installed lawns may be exempted from a ban if the procedures listed below are followed. Those wishing to use this exemption would need to contact the District office in advance of the exemption being granted, providing their name, address, phone number, size of lawn and type of watering system. This information would allow the District to quantify the amount of water used under this exemption and to spot check for compliance. The procedures relating to the exemption and the requirements of the exemption would be clearly outlined at the time of the ban. The following procedures are subject to change:
    - Each applicant would be mailed a packet stating the requirements.
    - Once the requirements are met, an authorization packet would be mailed to the customer including a sign to be posted indicating that the District's requirements are being complied with.
    - New lawns must be properly installed, meaning that two inches of organic soil amendment, such as composted yard waste or biosolids, is cultivated into the top six inches of existing soil, at a minimum.
    - New lawns must be watered according to guidelines to be provided in the packet mentioned above.
    - For purposes of this exemption, "new lawn" refers to a lawn newly installed during the current year only. Over seeded or otherwise renovated lawns would not be exempt.

- In the event that the shortage continues to worsen and the Emergency Curtailment Stage is invoked, this exemption would be revoked. It would also be revoked on a case-by-case basis if the rules stated above are not followed, or in the case of a water system emergency. Monitoring and enforcement are at the discretion of the District. The existence of an exemption to a watering ban would be announced early in the response process, for example when the Advisory Stage is invoked.

- **Automatic Irrigation System Exemption** - Users of automatic irrigation systems may be exempt from certain mandatory watering restrictions if proper procedures are followed - but not from a total watering ban. This approach allows an alternate path to achieving savings due to the precision with which such systems can be operated, but is not intended to be a loophole to avoid the need to curtail use. For example, if only 30 minutes of lawn watering is allowed per week, automatic irrigation systems which meet the criteria would be allowed to water based on a certain percentage of evapotranspiration (ET), such as 50%, instead of the time-limit based restriction. [Note: ET is a factor calculated according to climatic data, which is commonly used for lawn watering in commercial applications; ET data would be made available on the District's web page and in alternate formats.] In the event of a total watering ban, these users

would also be prohibited from watering (unless other safety-based criteria are met, as stipulated in the Water Conservation Implementation Plan).

- The procedures to be met include:
  - The area must be audited by an Irrigation Auditor as certified by the Irrigation Association (list from the IA to be available on request).
  - Irrigation efficiency of the system must be at least 62.5%, as defined by the Irrigation Association (includes both system distribution uniformity and management practices).
  - A baseline irrigation schedule based on historical ET must be provided to the system's owner/operator.
  - The owner/operator must evaluate actual ET on at least a weekly basis and change the irrigation schedule if warranted by the ET index.
  - The owner/operator must contact the utility to provide the name of the auditor, date of inspection and the efficiency rating, as well as the name, address and phone number of the contact person for the site being watered, prior to using the exemption
  - Time of day restrictions, such as watering prohibited between 6:00 am and 8:00 pm, would have to be met.
  - The system must have a functioning rain-shutoff device.
  - Watering limitations stipulated by the District would need to be followed. The limitations would be stated as a percent of ET, so that, for example, users who meet the above requirements would be able to water based on 50% of ET (the specific percent amount would be decided upon at the time the restriction is announced, depending on the supply outlook). The District's website (www.yvwd.dst.ca.us/conserve.htm) would be regularly updated to provide the information needed for those watering according to this exemption; the information would be available through other means as well.

- **Other Exemptions** - For purposes of dust control, water may be applied to construction areas or other areas needing to comply with air quality requirements. If recycled water is available, consider requiring or promoting that it be used for dust control, if feasible.

- Ball fields and play fields may be watered at the minimum rate necessary for dust control and safety purposes.
- The District will exempt customers with special medical needs such as home dialysis from any emergency surcharge provided individual customers notify the District of such a need

Water Supply Actions

- If not already implemented, activate interties and any other alternative sources of supply.

EMERGENCY CURTAILMENT STAGE

At this stage, the District recognizes that a critical water situation exists. Without additional significant curtailment actions, a shortage of water for public health and safety will be imminent. No prior emergency in the Yucaipa Valley Water District's history fits this description.

This stage is characterized by two basic approaches. First, increasingly stringent water use restrictions are established and enforced. Secondly, significant rate surcharges are used to encourage customer compliance. While a rate surcharge may be implemented in either the Voluntary or Mandatory stages, a surcharge is a key component to the success of this stage and previous surcharge may be increased if appropriate.

Emergency Curtailment Action Plan

- Continue all previous, applicable actions.
- Define the problem to the public as an emergency and institute formal procedures to declare an emergency.
- Inform customers of the rate surcharge and how it will affect them. Provide information on an appeal process.
- Coordinate with police and fire departments requesting their assistance in enforcing prohibition of water waste.
- Inform customers that taste and odor water quality problems may occur with system-wide reduced water consumption.
- Inform customers about possible pressure reductions and problems this may entail.
- Define and communicate exemptions for medical facilities and other public health situations.

YVWD Internal Operations for Emergency Curtailment Stage

- Continue and enhance "Water Watcher" patrols.
- Continue actions listed in prior stages.
- Curtail fire flow and pipeline testing unless it can be shown to be essential to protect the immediate public health and safety.
- Further enhance water quality monitoring actions

Supply and Demand Management Actions

- Rate surcharges would be implemented to encourage customer compliance with the restrictions, as follows:
    - **Commercial Customers** - Commercial, multifamily and industrial users would be asked to reduce water use by a set percentage of their consumption during the same period in the previous year. Emergency rate surcharges would be established to provide an additional incentive to reduce water use. It is the District's intention to establish a multi-tiered structure. This "variable block approach" would allow for different surcharge rates based on the individual customer's consumption during the same period in the previous year. For example, if the District were to target desired reduction of 85% from the previous year's consumption in that period, any consumption between 0 and 85% would be billed at one rate and any consumption over 85% would be billed at another, much higher rate. In this way, the targeted reduction amount and resulting surcharges would be customized around each customer's water use patterns, while still resulting in a steep surcharge for consumption in excess of the target amount for each block.
        - A billing system modification would be needed to allow the District to accomplish this. If this has not been done by the time it may be needed, a simple across-the-board rate surcharge would be applied.

- **Residential Customers** - A multi-tiered, increasingly steep rate structure would be implemented for residential customers (includes single-family dwellings and duplexes). While there are differences in household size, there is more similarity in residential domestic water use than there is in commercial water use.
    - All lawn and turf irrigation would be prohibited
    - Make recycled water available for street cleaning, construction projects, landscape irrigation, dust control, etc.
    - Require that all firefighting agencies discontinue the use of water in training exercises until emergency is over.
    - Rescind all construction meter or fire hydrant permits.

5.4.4 Short-Term Emergency Curtailment Plan

Although many of the demand reduction measures employed would be similar to those used during a progressive, weather-related shortage, short-term emergencies are unique because of a lack of preparation time and the urgency of immediate, large-scale demand reductions. Each emergency scenario is different, but most of them require major curtailment actions by customers. Also, unlike a drought, some emergencies would be localized, requiring demand reduction for only a limited geographic area.

Strategies for dealing with emergencies have been developed based on lessons learned from previous water utility events, other utility experiences, and a sorting of measures based on specific criteria.

Throughout water shortage events, consistent conservation messages and information on appropriate demand reduction measures should be delivered to water users through the media and by direct contact. Although exact demand reduction goals may not always be met by water users, the water demands during short-term emergencies must be curtailed enough to be beneficial and avoid more serious water shortages.

There are several criteria by which to decide which demand management measures are appropriate to initially reduce demand during an emergency:

- **Timing:** can the measure(s) or action(s) deliver the necessary savings in the necessary timeframe, i.e., are immediate savings needed or can the system support a gradual reduction in demand;
- **Magnitude of savings:** will the measure produce enough savings to make a meaningful difference i.e., reduce demand to the level the impaired water system can handle;
- **Season:** does the action make any impact at the time of year that the emergency occurs, i.e., banning lawn watering will have little impact in the winter months;
- **Costs:** How severe are the cost implications of the measure to the customer, including local business and industry.

5.4.5 Supply and Demand Management during Emergencies

No single strategy can be created which will meet the needs of the District for all emergency scenarios. The criteria listed above create a framework for decision-making. Emergencies initially require quick and immediate response. Once an assessment is made as to how long it will take to restore the system, the immediate response strategy may change if it appears that the repair process will be lengthy.

The strategy for most emergencies can be narrowed to measures having the most immediate impact on water supply and consumption. All needed and available back up supplies would be activated during an emergency, including the use of interties and standby water production wells.

Section 6

Demand Management Measures

6.1 Demand Management Measures

Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection, and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial, and institutional accounts; (J) wholesale agency programs; (K) conservation pricing;(L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-low flush toilet replacement programs (California Water Code Section 10631(f)(1) and (2).

A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan (California Water Code Section 10631(f)(3)).

An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand (California Water Code Section 10631(f)(4)).

An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation (California Water Code Section 10631(g)).

Demand Management Measures are mechanisms implemented by Yucaipa Valley Water District to increase water conservation. A description if each Demand Management Measure is listed below defining the current status of implementation. Yucaipa Valley Water District is a signatory to the California Urban Water Conservation Council's Memorandum of Understanding,

which was developed to expedite implementation of reasonable water conservation measures in urban areas and to establish assumption for use in calculating estimates of reliable future water conservation savings. The Department of Water Resources Demand Management Measures coincides with the 14 Best Management Practices developed by the California Urban Water Conservation Council. The conservation measures are defined below.

Table 6-1 Urban Water Management Plan Demand Management Measures and California Urban Water Conservation Council Best Management Practices

UWMP Demand Management Measures		CUWCC BMP Organization Names (2009 MOU)	
DMM #	DMM Name	BMP #	BMP Name
A	Water survey programs for single-family residential and multifamily residential customers	3.1,3.2	Residential Assistance Programs
B	Residential plumbing retrofit	3.1	Residential Assistance Programs
C	System water audits, leak detection, and repair	1.2	Water Loss Control
D	Metering with commodity rates for all new connections and retrofit of existing connections	1.3	Metering with commodity rates for all new connections and retrofit of existing connections
E	Large Landscape Conservation Programs	5	Landscape
F	High-efficiency washing machine rebate programs	3.3	High-efficiency clothes washing machine financial incentive programs
G	Public Information Programs	2.1	Public Information Programs
H	School Education Programs	2.2	School Education Programs
I	Conservation programs for commercial, industrial and institutional accounts	4	Commercial, Industrial, and Institutional
J	Wholesale agency programs	1.1.3	Wholesale Agency Assistance Programs
K	Conservation Pricing	1.4	Retail Conservation Pricing
L	Water Conservation Coordinator	1.1.1	Conservation Coordinator
M	Water waste prohibition	1.1.2	Water Waste Prevention
N	Residential ultra-low flush toilet replacement programs	3.4	Water Sense Specification (WSS) Toilets

6.1.1 Landscape Water Survey – Scheduled for Implementation

The Yucaipa Valley Water District became a signatory to the California Urban Water Conservation Council's (CUWCC) MOU in 2007 requiring 15% of single family and 15% of multi-family accounts receive surveys within 10 years of the implementation year. YVWD has approximately 11,044 single-family residential dwelling units and 518 multi-family units. To comply with the within the (CUWCC) coverage requirements, the District must offer surveys to 2209 (20%) per year with the goal of completing 15% (1656) in 10 years. This is equivalent to 165 surveys per year. The single-family survey is expected to cost $150 with the multi-family survey totaling $50. Therefore a budget of $24,750 per year is required (Yucaipa Valley Water District, Feasibility Study, 2003).

- Implementation Schedule

  YVWD will implement a landscape water survey program for residential customers by 2015. This concept may be completed with agency collaboration with the City of Yucaipa and Inland Empire Resource Conservation District. In addition, water retailers within the San Bernardino Valley Municipal Water Districts service area are collaborating to determine the most cost effective way to partner on the Demand Management Measures.

- Evaluation of Effectiveness

  The evaluation of effectiveness will be determined by the number of single-family and multi-family account landscape water surveys completed during the reporting period.

6.1.2 Residential Assistance Program – Scheduled for Implementation

YVWD does not have a formal leak detection assistance program. However, YVWD actively responds to customer leaks throughout the year and at that time, discussions regarding water usage on the landscape often occur. Coverage requirements for the residential assistance program would be provided simultaneously with the coverage requirements of the landscape water survey referenced in 6.1.1 above.

- Implementation Schedule
  YVWD will implement a Residential Assistance Program for single-family households by 2015. YVWD does not currently have a formal water survey program. In 2010, YVWD public works department did conduct 88 service calls to repair leaks throughout the District service area. This provides an opportunity to discuss water efficiency measures and provide a water survey program to the customer.

- Evaluation of Effectiveness
  The evaluation of effectiveness will be determined by monthly water usage reductions with each residential assistance program conducted. In addition customers receive both current and previous year water usage, graphed by month, on their monthly bills for comparison of usage.

6.1.3 WaterSense Specifications for New Residential Development - Implemented

In April 2010, YVWD purchased 500 faucet aerators that qualified under the WaterSense Specifications (WSS) in order to meet one component of the water-survey program.

- Implementation Schedule – Faucet Aerators
  The faucet aerators were purchased to coincide with several community events that provided a substantial audience to distribute and educate about the importance of water efficient devices inside and outside the home. Distribution of the faucet aerators took place during the following events.
  1. Iris Festival – May 14th 15th and 16th 2010
     The Iris Festival is a three-day community event located in the City of Yucaipa. Vendors are comprised of public and private agencies, which host approximately 20,000 attendees.
  2. Calimesa 20th Anniversary – November 6th 2010
     The Calimesa 20th Anniversary event consisted of booths and activities for residents in Yucaipa and Calimesa. The venue provided an opportunity for YVWD to discuss indoor and outdoor water-saving techniques.

Table 6-2 Faucet Aerator Quantification

Water Efficiency Product	Quantity	Cost per Device	Estimated Water Savings Per Household
WaterSense Specification Faucet Aerator	500	0.91	1.2 gallon savings pp x 4 pph.
Total		$495.00	1,753 gallons per year

*DeOreo, et. al. 2001

It's often difficult to gage the effectiveness of water efficient devices since installation tracking is not cost effective for a water retailer. Effectiveness relies on not only the device installation but the education component that is conducted during the giveaway.

- Implementation Schedule – Low-flow Showerheads
  In 1991, it is estimated there were 6,634 single-family residences and 2,299 multi-family units within YVWD boundaries. In 2008, the numbers increased to 10,964 single-family residential units and 503 multi-family units. Yucaipa experienced significant growth of single-family residential units from 1995 – 2008 resulting in the "current housing" interpretation to be a greater saturation than 53% as referenced in the 2003 YVWD Urban Water Conservation Feasibility Study and Implementation Plan.

- Evaluation of Effectiveness
  Proper distribution and installation of low-flow showerheads has an effect on the 75% saturation goal. Customers who presently have a low-flow showerhead may have a tendency to acquire an additional device, keeping the saturation level at a zero net gain. In addition, customers who take advantage of the free low-flow showerhead may not install the device as expected. This program coupled with the residential assistance program becomes imperative to ensure the customer installs the low-flow device within the home.

6.1.4 Leak Detection and Repair and System Water Audits, - Implemented

Yucaipa Valley Water District has been conducting a system water audit, leak detection and repair program since 2002. The water audits are conducted by an outside consultant who conducts a 10-day leak detection survey on various sections of the water distribution system for the District. A total of 75.45 miles were surveyed in 2010.

- Implementation Schedule

  YVWD's leak detection program occurs every year in approximately March of each year. The water audits locations rotate each year in order to have a historic tracking of leak detection throughout the district.

- Evaluation of Effectiveness

  Thirty-one total leaks were detected in 2010. Most of the reported leaks were due to YVWD public works staff repaired leaks that were detected through the water audit. In addition, there were a total of 8 leak identified on customers properties. Notification letters were sent to these customers in order to notify them to conduct the repairs.

Table 6-3 Yucaipa Valley Water District – Leak Detection Program

Total Leaks	GPM	Average / Per Leak	Calculated Totals
31	47.75	1.54	
Gallons Per Minute			47.75
Gallons Per Day			68,760.00
Gallons Per Year			25,097,400.00
Acre Feet Per Year			77 AFY

System Water Audits

In order to comply with BMP 1.2 – System Water Audits, YVWD recognizes that completing the standard water audit and balance using the American Water Works Association (AWWA) Water Loss software is required. This is to determine the current volume of apparent and real water loss and the cost impact of these losses on utility operations.

YVWD has not implemented the AWWA Water Loss methodology as of December 2010. The schedule for implementation of the AWWA Water Loss Control Program is March 2012 to coincide with the next Water Line Leak Detection Program.

6.1.5 Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections - Implemented

YVWD implements metering and commodity rates for the residential water service with a tiered or inclining block rate structure and five tiers or blocks, with inclining rates based on increased usage. In 2010 there were a total of 12,126 potable and recycled water metered accounts with 100% coverage. However Sewer rates are flat rates for residential service and uniform rates, increasing block rates or long-run marginal cost rates. Commercial and industrial water and sewer service are metered and billed according to consumption quantity.

- Implementation Schedule

The metering with commodity rates for all new connection takes place on the retail water service portion but not on the sewer service portion for residential homes. Metering residential sewer activity will most likely not occur.

- Evaluation of Effectiveness

Customers can review the five-tiered rating structure on their monthly bill. In addition, YVWD adopted a Water Meter Repair, Maintenance and Replacement Program in October 2010. The metering with commodity rates structure provides YVWD the opportunity to recover costs associated with the fluctuations in water service.

6.1.6 Large Landscape Conservation Programs and Incentives - Implemented

Large landscape programs generally include landscapes over three acres such as schools, parks, golf courses and other commercial, industrial and institutional customers. The incentives often consist of Weather Based Irrigation Controllers (WBIC), system retrofits and irrigation training. In 2010, YVWD partnered with San Bernardino Valley Water District on a weather-based irrigation controller program in order to target large landscape water users.

- Implementation Schedule

The WBIC program was implemented in 2010. The San Bernardino Valley Municipal Water District developed a Weather Based Irrigation Controller Program that funds 50% of the cost to install Weather Based Irrigation Controller Systems on publically owned sites. In order for the WBIC program to accurately interpret weather conditions, YVWD installed a Weather Station at the Yucaipa Valley Regional Water Filtration Facility in December 2009. In addition, YVWD also installed irrigation system controllers at nine (9) District owned sites in order to determine the effectiveness of the WBIC's. The nine sites selected would benefit from the program since they used approximately 500 acre-feet of water in FY 2009. The following table demonstrates the commitments made to the Landscape Water Survey

- Evaluation of Effectiveness

Studies have shown that Weather Based (ET) control systems can result in water savings of 25% to 45% per year. The implementation schedule correlates to the evaluation of effectiveness. During the 2010 calendar year it was determined that water consumption at weather based irrigation controller locations did not decrease. This was due to the fact that in most instances human practice consisted of turning off sprinkler systems during the cooler months whereas the WBIC's continued to water minimally during that time. In addition, some of the locations may have been stressed in the summer months prior to the WBIC installation due to lack of watering presumably due to reducing costs.

Table 6-4 Weather Based Irrigation Controller Program Costs

Task	Cost
Weather Based Irrigation Controllers	$5,450.00
Weather Station (1)	$3,725.00
Water Audits	$1,240.00
Total	**$10,415.00**

6.1.7 High-Efficiency Washing Machine Rebate Programs – Scheduled for Implementation

This BMP provides incentives or institutes ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense Specification is less than 5.0, then the average water factor value will decrease to that amount.

- Implementation Schedule
  This Demand Management Measure provides a default assumption of water savings equal to 5,100 gallons per year, or .022 AF/. With a service life of 10 years and avoided costs equal to $417/AF, the benefit in undiscounted dollar terms is $92 incentive for high efficiency washers. These results indicate YVWD should provide a $92, possibly $100 incentive for high efficiency washers. This BMP is scheduled for implementation during fiscal year 2011-2012. The budgeted amount has not been determined to report the estimated number of rebates offered.

- Evaluation of Effectiveness
  Under state legislation passed in 2002, the Energy Commission established standards to ensure washing machines sold in California after 2007 use no more than 8.5 gallons of water per cubic foot of washing machine capacity, later decreased to six gallons by 2010. Water efficient washing machines will use on average only 21.1 gallons per wash, or 8,271 gallons a year - compared to typical models that used an average of 39.2 gallons per wash or 15,366 gallons a year for a normal household three years ago. While the consumer on average will pay $130 more for a washing machine, savings during the life of the machine will average $242 in lower energy costs and water bills (Energy Commission, 2002).

6.1.8 Public Information Programs - Implemented

The public information BMP component consists of utilizing public information programs as an effective tool to inform customers about the need for water conservation and ways they can conserve, and to influence customer behavior to conserve.

Yucaipa Valley Regional Water Filtration Facility Tours

YVWD has an active public information program, which provides numerous tours throughout the year at the Yucaipa Valley Regional Water Filtration Facility. In 2010, YVWD conducted 32 tours to various members of the community. Tour dialogue consisted of identifying YVWD's water sources, methods of drinking water treatment along with a water conservation component. Prior to 1997, water supply was 100% groundwater. Due to the increase in growth, the groundwater basins were decreasing rapidly, requiring imported water and recycled water. The facility tours provide an opportunity to transfer this information to the community to discuss the importance of water conservation throughout the community.

Website Outreach

In 2010 YVWD restructured the website to include more comprehensive information about YVWD. The new website has a specific drop down Conservation tab in order to direct customers directly to the water conservation component of the site. Additional information includes; the Drought Contingency Plan, Landscape Showcase which includes information and photographs about drought tolerant landscaping tips and techniques and water saving tips for customers. The YVWD website can be found at www.yvwd.dst.ca.us

Community Event Participation

YVWD is actively involved in various community events to communicate the current projects and goals undertaken by the District.

Monthly Bill Notifications

YVWD has the capability to include significant information about relevant water awareness news. For example, in 2010 YVWD included several conservation tip notifications on the customer bills. For example, the August 2008 bill included a tip to keep showers under 5 minutes to save 1000 gallons of water per month.

Media Outreach

Media outreach is a necessary element in YVWD's Public Information Program. The local media is present at every YVWD Board Meeting in order to communicate the current activity taking place within the District. In addition, YVWD utilizes a public affairs professional to develop articles that inform the community on important current affairs relevant to YVWD.

Drought Tolerant Landscaping

YVWD participated with San Bernardino Valley Municipal Water District's Inland Empire Garden Friendly campaign. The Inland Empire Garden Friendly program was developed by the four major water suppliers of western Riverside and San Bernardino counties in California with cooperation from a university institute, conservation district and local botanic garden. The purpose of the program is to develop a strategy to strengthen consumer demand for climate-appropriate landscaping. The project began in December 2010 so results and effectiveness of the program are to be determined.

- Evaluation of Effectiveness
  YVWD's Public Information program is extremely successful and beneficial for the customers. The multi-faceted outreach programs target a diversified audience in order to ensure wide-ranging coverage of water conservation messaging.

6.1.9 School Education Programs - Implemented

Yucaipa Valley Water District partners with Inland Empire Resource Conservation District (IERCD) on water conservation programs within the schools. YVWD and IERCD collectively developed a program for the K-12 student, which also meets the California State Standards

criteria for science. IERCD staff visits the school site and conducts the water conservation program. Topics are grade specific to the State Standards but all students are taught the universal element of Yucaipa and Calimesa's water sources and the importance of water conservation. In 2010, IERCD conducted 21 water conservation programs on behalf of YVWD.

- Evaluation of Effectiveness
  IERCD distributes teacher surveys at the conclusion of each program. In most instances the surveys aren't returned for review but the occasional completed forms offer an opportunity to gage program success. In addition, students who received the program in previous years retain the information and actively engage in the water conservation program the subsequent year.

6.1.10 Conservation Programs for Commercial, Industrial, and Institutional Accounts – Scheduled for Implementation

Commercial, industrial and institutional (CII) water demands make up a large percentage of total demand for California (CUWCC, MOU June 2010). YVWD has identified and ranked by use commercial, industrial and institutional customers, YVWD does not have a large manufacturing population. Current commercial, industrial and institutional accounts in the base year 2008 total 288. This portion of the population consumed 206.88 million gallons or 635 acre feet within the 2008 calendar year.

- Implementation Schedule
  YVWD is not currently meeting the Conservation Programs for CII accounts at this time. It was determined in the 2005 UWMP that the best way to meet the Demand Management Measure was through ultra low flush toilets (ULFT). An implementation schedule and cost is represented in the table below.

Table 6-5 Commercial, Industrial, and Institutional Ultra Low Flush Toilet Rebate Program

Program Intervention	FY 2012-13	FY 2013-14	FY 2014-15
CII Ultra Low Flush Toilets	$7,750	$15,300	$23,150

(2005 Urban Water Management Plan, numbers changed to reflect present value cost estimates.)

- Evaluation of Effectiveness
  The Conservation Programs for CII Accounts effectiveness will be evaluated by the number of CII ULFT's installed. The CII accounts can be cross referenced with past consumption data to determine if water use decreased.

6.1.11 Wholesale Agency Programs

Not Applicable

6.1.12 Conservation Pricing - Implemented

The Retail Water Service Rate BMP was developed to establish a strong nexus between volume-related system costs and volumetric commodity rates, allowing conservation pricing to reward water efficient customers.

YVWD practices conservation pricing for its water service with a commodity rate structure that includes five tiers.

- Implementation

YVWD is currently implementing conservation pricing. With the incentive to conserve structured in the water rate, it is deemed unnecessary to attempt to construct a commodity rate structure for sewer service. Additionally the accuracy of such rate structures, which rely on a formula based on water consumption, are questionable as they generally assess charges based upon winter season demands, which vary demanding on hydrology of a given year and landscaping demands YVWD UWMP, 2005).

- Evaluation of Effectiveness

The effectiveness of this program can be evaluated by longitudinal studies reviewing billing consumption records and pricing structure for a sampling of housing units over time. (YVWD UWMP, 2005)

Table 6-6 Conservation Pricing

Potable Water Commodity Charge - Step Rate Table-per 1000 gallon units	
Units	Cost/Unit
1-15	$1.429
16-60	$1.919
61-100	$2.099
101 & over	$2.429
30+ multiple units X 0.800 factor	
Non-Potable Water - Commodity Charge	
1000 gallons	$1.235

6.12 Water Conservation Coordinator - Implemented

In March 2010 YVWD hired a full-time Resources Sustainability Manager to carry-out the water conservation programs required by the Department of Water Resources and the California Urban Water Conservation Council.

Jennifer Ares
Resource Sustainability Manager
12770 Second Street
Yucaipa, CA 92399
(909) 790-3301 / jares@yvwd.dst.ca.us

6.13 Water Waste Prohibition - Implemented

This program consists of implementing methods that prohibit gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non recycling decorative water fountains.

- Implementation

YVWD has a Water Waste Prohibition Ordinance, which is included within Ordinance No. 48-1998, section 5.15. The ordinance was passed in 1998 and should be updated to correlate with current industry trends and standards. YVWD will adopt a new water waste ordinance within the Calendar Year 2011.

6.1.15 Residential Ultra-Low Flush Toilet Replacement Programs – Not Implemented, will be considered in FY 2012-2013

YVWD does not have a current Toilet rebate program. As mentioned with the other water conservation device replacement programs, a key element necessary to consider targeting conservation programs the device market saturation. YVWD has experienced a considerable amount of new development since 1992. New building codes have propelled water conservation devices increasing the saturation within the community.

In addition beginning January 1st, 2014, 100% of all toilets and urinals sold or installed within the state must be high-efficiency fixtures meeting requirements of the two key plumbing standards, ASME A112.19.2 and ASME A112.19.14. The effective flush volume cannot exceed 1.28 gallons.

- Implementation Schedule

As a result of the impending plumbing standards, YVWD will maximize this water savings Demand Management Measure by possibly implementing toilet rebates in July 2014. This will provide YVWD the opportunity to plan and budget for the rebate program.

- Evaluation of Effectiveness

The evaluation of the effectiveness of the toilet rebate program will be determined through a customer water usage comparison after the toilet installation.

Section 7

Climate Change

Water agencies invest a considerable amount of time determining the most effective way to manage water resources. One frequent challenge consists of forecasting environmental factors that have a direct effect on the availability of water resources. Many of these environmental factors can be expected but determining the magnitude and the timing is complex.

Environmental factors such as climate change have become a leading environmental concern water agencies have included in their water reliability planning. Climate change is defined as the earth's atmosphere trapping solar energy, which collects greenhouse gases (GHGs). Exacerbated by human practices, GHG's consists of water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2o), ozone (O3), and chlorofluorocarbons (CFC's) that form a type of barrier, which reflects the light and infrared radiation back to the earth. Table 7-1 below represents the various greenhouse gases and their 100-year global warming potential along with their expected atmospheric lifetime. The table is a representation that these GHG will continue to rise before they have time to dissipate from the atmosphere.

Table 7-1 – Global Warming Potential and Atmospheric Lifetimes of Basin Greenhouse Gases

Greenhouse Gases	100-year Global Warming Potential (1)	Atmospheric Lifetime (yrs)
Carbon Dioxide – CO2	1	Variable
Methane – CH4	21	12(±3)
Nitrous Oxide – N2O	310	120
Sulfur Hexaflouride – SF6	23,900	3,200

(1) The warming effects over a 100-year time frame relative to other GHG (USEPA, 2009)

These statistical estimates necessitate the need for climate change analysis in order to attempt to reduce negative impacts to the environment, in this particular case, water reliability and sustainability. The Lead Climate Change and Water Intergovernmental Panel and the Environmental Protection Agency conduct analyses of the greenhouse gases listed above. The Panel states; high priority water resources challenges that are affected by climate can be categorized into four interrelated areas:

- Assuring an adequate water supply;
- Protecting human life, health, and property;
- Protecting the quality of freshwater resource and the ecosystem they support; and
- Protecting coastal and ocean resources and the ecosystems they support.

Furthermore the Panel states, to assure an adequate water supply now and into the future, water managers and decision makers need the capacity to predict and anticipate:

- How aquatic ecosystems respond to the short- and long-term changes in freshwater quantity, quality and availability;
- Historical patterns and projected trends in annual and seasonal variability in streamflows, groundwater levels, and snowpack characteristics to improve water use planning and provisioning;

- How future climate, water management decisions, and land-use scenarios will impact water uptake for agricultural, energy, water and wastewater treatment requirements, health risks, and aquatic ecosystem biodiversity;
- How water quality will change in response to the types and quantities of chemical and microbial contaminants, warmer and more variable water temperatures, different flow patterns, and alternative water resource management practices; and
- Impacts of climate, land-use, and water management practices in conjunction with streamflows, precipitation patterns, and groundwater recharge on saltwater intrusion into freshwater aquifers and estuaries and salinity in water supplies.

In order to predict and anticipate the scenarios mentioned above observation data, agencies that provide the data, the systems that produce the data, and the models that enable projection of future climate conditions are critical for decision making. There has been an extensive amount of information developed regarding climate change however merging the data to act as a functional tool is necessary for water agencies to successfully utilize and make predictions. During the planning timeframe of the 2010 Urban Water Management Plan, the Subcommittee on Water Availability and Quality (SWAQ) will work to improve data integration among the various agencies.

7.1 Climate Change in California

In 2006 the first California Climate Action Team (CCAT) Report to the Governor contained recommendations to the strategies to help meet the targets of Executive Order S-3-05 listed below.

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 Percent below 1990 levels.

Following the Executive Order which defines these periodic milestones several legislative actions were taken.

7.1.1 Assembly Bill 32 (AB 32) – The California Global Warming Solutions Act of 2006

In 2006, the Legislature passed and Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. It directed the California Air Resources Board (ARB or Board) to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit. The reduction measures to meet the 2020 target are to be adopted by the start of 2011 (http://www.arb.ca.gov/cc/ab32/ab32.htm.)

- Develop a scoping plan outlining actions to reduce greenhouse gases in California. The approved scoping plan indicates how these emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions.

- In December 2007, the Board approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gases.

- Adopt a regulation requiring the mandatory reporting of greenhouse gas emissions (HSC §38530). The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels.

- Identify and adopt regulations for discrete early actions that could be enforceable on or before January 1, 2010 (HSC §38560.5). The Board identified nine discrete early action measures including regulations affecting landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations and other sources in 2007 that included ship electrification at ports and reduction of high GWP gases in consumer products. Regulatory development for the remaining measures is ongoing.

- Ensure early voluntary reductions receive appropriate credit in the implementation of AB 32 (HSC §38562(b)(3)). In February 2008, the Board approved a policy statement encouraging voluntary early actions and establishing a procedure for project proponents to submit quantification methods to be evaluated by ARB.

- Convene an Environmental Justice Advisory Committee (EJAC) to advise the Board in developing the Scoping Plan and any other pertinent matter in implementing AB 32 (HSC §38591).

- Appoint an Economic and Technology Advancement Advisory Committee (ETAAC) to provide recommendations for technologies, research and greenhouse gas emission reduction measures (HSC §38591).

7.1.2 Senate Bill 97

Senate Bill 97 requires the Office of Planning and Research (OPR) to, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption.

On April 13, 2009, OPR submitted the proposed amendments to the Secretary for Natural Resources. The Natural Resources Agency conducted formal rulemaking in 2009, certified the amendments in December 2009, and adopted and codified into law the amendments in March 2010. The amendments become effective in June 2010 and provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

7.1.3 Executive Order S-13-08

The Sea Level Rise Planning Directive's specific actions include; define where California is most vulnerable to climate change, a National Academy of Sciences study on sea level rise, guidance to state agencies regarding sea level rise near coastal and floodplain areas, and initiate studies on critical infrastructure projects and land-use policies vulnerable to sea level rise.

7.1.4 California Code of Regulations (CCR) Title 24, Part 6

Specific energy efficient building codes were established in 1978 unintentionally decreasing GHG emissions. In 2008, the building standards were changed to reflect reasonably priced energy supply, AB 32 compliance, continually upgrade of the Building Energy Efficiency

Standards, energy efficient state building codes and improve energy efficiency of nonresidential buildings.

7.2 Potential Climate Change Impacts to Yucaipa Valley Water District

The Yucaipa Valley Water District is located in a high elevation valley at the base of the San Bernardino Mountain Range. The District's primary service area ranges in elevation from a low elevation of 2,044 feet above sea level to a high elevation of 5,184 feet above sea level. The range in elevation of 3,140 feet within the District's service area requires the District to provide water service from 18 separate pressure zones. The service area, which is comprised of the cities of Yucaipa and Calimesa, is located in the Santa Ana Watershed, approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego. This region is often referred to the Inland Empire.

Santa Ana Watershed Water Supply Effects Due to Global Warming

- Increased temperatures
- Variable precipitation levels
- Reduced snowpack, reducing deliveries to Southern California

7.2.1 Warmer Temperatures

The initial product of climate change is the increase in air temperatures due to the GHG buildup in the atmosphere. The Inland Empire's temperatures average 15° warmer than the coastal regions due to the natural border of the San Bernardino Mountains. The RAND Corporation is a nonprofit institution that improves policy and decision-making through research and analysis. The RAND Corporation conducted a temperature forecast for Southern California, including the Santa Ana Watershed region. The projection anticipates warmer temperatures, which will intensify heat island effects from the watershed's existing urban development (SAWPA, IWMP, 2009). Higher temperatures will increase levels of evaporation and transpiration, which in turn increase water demand for the region.

7.2.2 Snowpack and Streamflows

Currently, YVWD's water supply source is comprised of 50% State Water Project water and the additional 50% local sources consisting of groundwater basins and surface flows. Snowpack alterations have a direct effect on YVWD water supplies. The source of SWP water originates in the Feather River watershed, located in Northern California. The Feather River watershed originates in the Sierra Nevada Mountains. While 2009 and 2010 experienced above average snowpack, the average early snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, representing a loss of 1.5 million acre feet of snowpack storage (SAWPA, IWMP, 2009). Rainfall has become extremely variable as dry and wet years are recorded in the past ten years.

This activity of outflows and exports in the Delta are often of interest for water management in California. Figures 7-1 and 7-2 show monthly average results from the three statewide model runs. Delta exports do not change much (with possible exceptions for June and July) with water demand changes from 2020–2050. Dry-warm climate warming, however, increases Delta exports in winter months (when runoff would be more plentiful), decreases significantly during the present spring snowmelt season, and decreases a little during the summer. Surplus Delta outflows (Figure 7-2) do not change much with population change alone from 2020 to 2050, but decrease greatly with dry-warm climate change.

Figure 7-1 Monthly average delta exports, statewide optimizations (TAF/month)

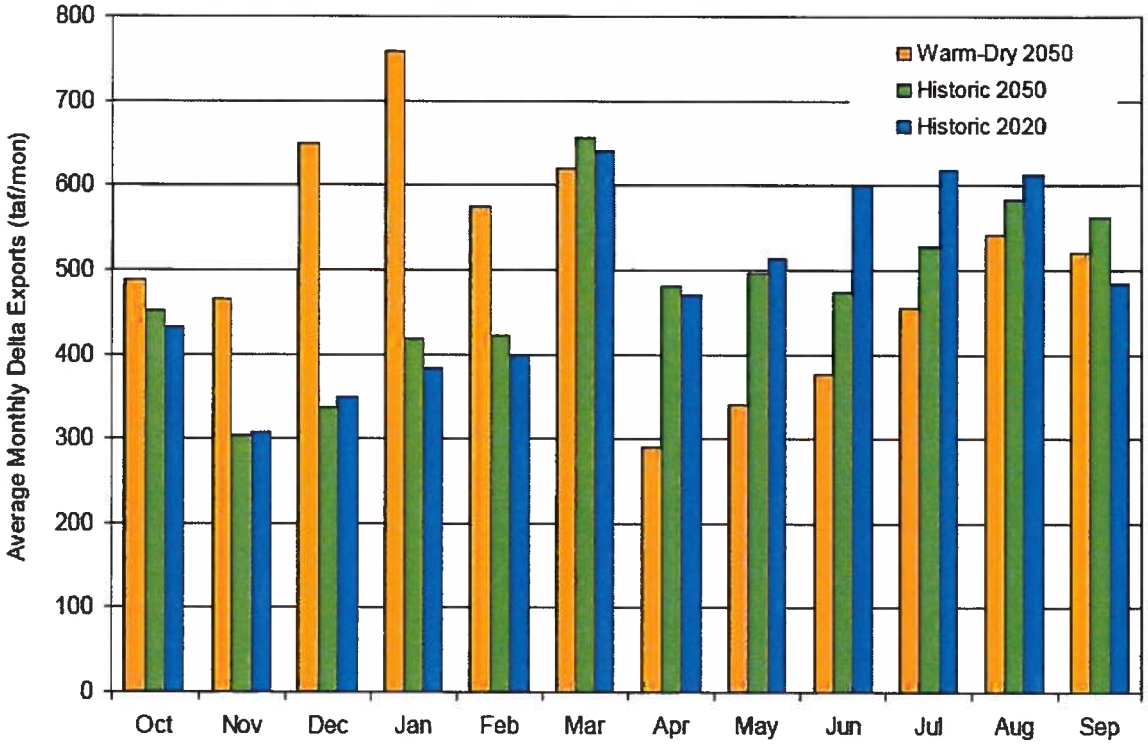
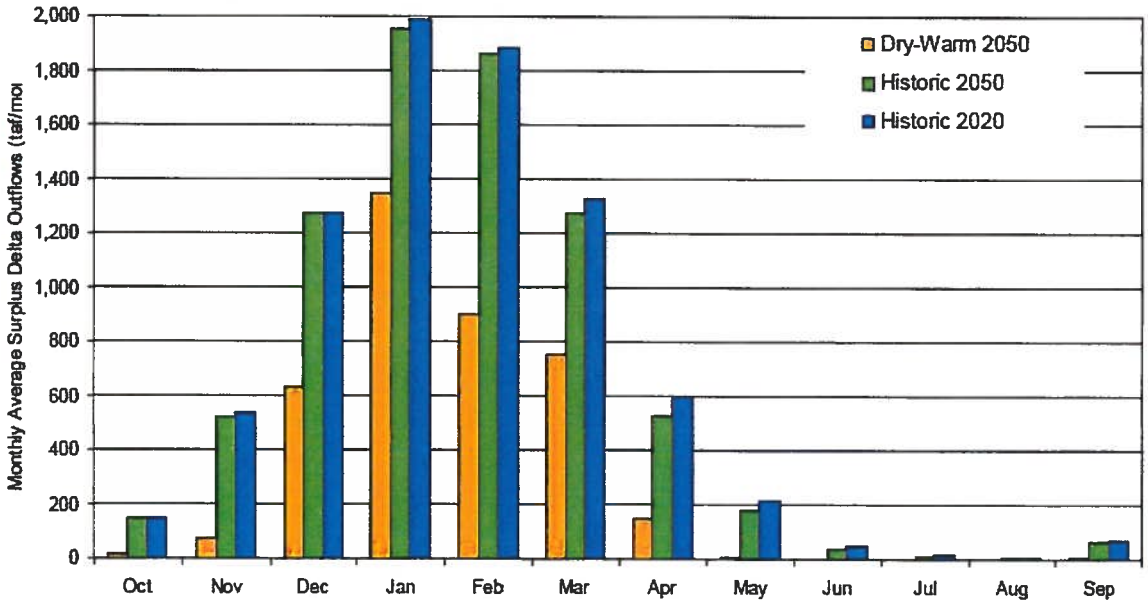


Figure 7-2. Monthly average surplus delta outflows, statewide optimizations (TAF/month)



7.2.3 Elevated Flood Risk

The Santa Ana Watershed will most likely experience peak water flows due to accelerated snowpack melting. This scenario would most likely limit the amount of surface water captured. High intensity storms would prevent groundwater replenishment from occurring in the Yucaipa, San Timoteo and Beaumont Basins. The topographical makeup of the Yucaipa Valley consists of an elevation change of 3140 feet, characteristically causing water flows to increase as they retreat from the foothills. Climate change may have a tendency to increase storm intensity, decreasing the chance of stormwater capture into our local basins.

7.2.4 Increased Wildfire Risk

Current climate models for forests and rangelands predict that California will soon be experiencing many changes as a result of climate change. These include increased wildfire frequency and intensity; longer fire seasons; declines in distribution, productivity and health of conifers and some range species; changes in ecosystems, wildlife habitat and populations; potential increases in drought, insects and disease in Southern California; and increased spread of invasive species.

Healthy forests have an important role to play in addressing climate change. Trees remove carbon dioxide, the primary greenhouse gas of concern, from the air and store it as carbon in as they grow. When trees die, they release CO2 back into the atmosphere. Forest damage and loss to wildfires, insects and disease, or development can result in large CO2 emissions. (http://www.fire.ca.gov/resource_mgt/resource_mgt_eprp_climate/climate_change.php)

Yucaipa Valley Water District is located in the foothills of Yucaipa which is bordered by mountains, open fields and undeveloped lots contiguous to residential development. Residential landscaping, fencing and outbuildings increase fuel loading, spotting and fire intensity.

Calfire has developed a Fire Hazard Model, which considers the wildland fuels. The model also considers topography, especially the steepness of the slopes. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. The model defines fire hazard areas as moderate, high and very high. The YVWD is classified in the 'Very High' Zone due to the close proximity to the bordering mountains.

The American Water Works Association (AWWA) emphasizes that whether or not fire is an ecological benefit to the unique ecology in the region, fire has a serious impact on water supply in terms of both reduced water quality and possible storage capacity due to sedimentation. Increased wildfires due to climate change would increase the need to retain water quality and ensure erosion control measures are proactively put in place to prevent sedimentation accumulation.

7.3 Climate Change Management Strategies

Water managers will embark on new strategies and modeling to determine how to account for future climatic alteration. YVWD's current approach to increase local water reliability with more sustainable practices will reduce the climate change impact for the region.

- Recycled Water System Expansion – Recycled water becomes a drought proof method of water supply. YVWD has developed a recycled water program and is currently expanding to provide an increase supply of recycled water or the community. In 2006, the California Energy Commission released a report, Refining Estimates of Water Related Energy Use in California, in which they concluded that water supply/conveyance is the most energy intensive source of water, with imported water supplies in southern California requiring almost five times the energy than water supplied to northern California.
- Alternative energy sources are also being explored by YVWD in order to establish a more efficient facility while reducing greenhouse gases.
- Maximizing groundwater recharge is an additional approach YVWD is utilizing in order to increase local supplies.

The next National Climate Assessment is due in 2013, this document will provide an opportunity for enhanced water related data collection in partnership with regions and sectors as well as improved mechanisms for data interoperability

During the 2010 Urban Water Management Planning timeframe, advances in climate change data collection and interpretation will be developed in order to attempt to predict upcoming climate change impacts on water supply reliability and sustainability.