



California Regional Water Quality Control Board



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February 8, 2008

TO INTERESTED PARTIES:

File Assimilative Capacity

LAHONTAN REGIONAL BOARD MEETING, FEBRUARY 13 AND 14, 2008 IN VICTORVILLE, CALIFORNIA

Enclosed for your information is a copy of Agenda Item No. 7 for your review. This item is an information item only scheduled for the **February 13 and 14, 2008** meeting in Victorville, California.

If you need further information regarding this meeting, please contact our office.

Sincerely,

Rebecca Phillips
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Enclosures: Staff Report
Agenda Announcement

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**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION
MEETING OF FEBRUARY 13 AND 14, 2008
VICTORVILLE, CALIFORNIA**

ITEM: 7

SUBJECT: ASSIMILATIVE CAPACITY WORKSHOP

CHRONOLOGY: This is a new item.

ISSUE: How should Lahontan Water Board consider the assimilative capacity of groundwater basins in implementation of its water quality control actions?

DISCUSSION: This item provides the Lahontan Water Board and stakeholders a better understanding of the factors involved in making decisions within context of State Water Resources Control Board Resolution No. 68-16, the "Policy to Maintain High Quality Waters in California". This policy, otherwise known as the Nondegradation Policy, requires that whenever the existing quality of the water is better than the water quality objectives established in the Basin Plan, the existing high quality shall be maintained. In implementing the various control actions to protect beneficial uses of a water body, the Lahontan Water Board must consider the Nondegradation Policy. However, the Nondegradation Policy allows a water board to permit degradation of a water body if the degradation will not violate water quality objectives in the Basin Plan, and the public benefit from a degradation can be demonstrated. Any activity in the basin, whether it be within or outside of the Lahontan Water Board's authority, that permits a degradation uses some or all of the assimilative capacity of the water body. This workshop will address how assimilative capacity is considered in Lahontan Water Board control actions.

RECOMMENDATION: This is an information item only. The Board may provide direction to staff.

Enclosure: 1. Staff Report

B02008/ Assimilative.GS

07-0001

ENCLOSURE 1

07-0002

STAFF REPORT

ASSIMILATIVE CAPACITY WORKSHOP

February 2008

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07-0003

STAFF REPORT

Assimilative Capacity Workshop

1. Background and Purpose

Many decisions by a regional board involve the allocation of the assimilative capacity of a water body to a discharge. In recent years more attention has been given to this important consideration due to growth induced increases in discharges of waste to our limited high quality water supplies.

In adopting the Porter-Cologne Water Quality Control Act, the California Legislature declared:

"that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."

In 1968 the State Water Resources Control Board (State Water Board) established a policy to implement the Legislative findings. This policy is named "*Policy to Maintain High Quality Waters in California*" – Resolution No. 68-16 but it has often been referred to as the Nondegradation Policy giving many the incorrect impression that degradation of water quality is never to be allowed. In reality, the policy establishes criteria that the State Water Board and regional water boards are to use in determining if degradation should be allowed and, if so, to what extent.

The purpose of this workshop is to provide the Lahontan Water Board and stakeholders with a better understanding of the factors that should be evaluated in making decisions within the context of Resolution No. 68-16. Although the remainder of this staff report will focus on decisions affecting groundwater, much of the information is also applicable to decisions affecting surface waters. It is likely that additional workshops will be needed so that the Lahontan Water Board can provide direction to its staff on the type and amount of information that it expects to be presented to it when a decision on degradation is pending.

As will be discussed in more detail in this report, activities that can affect water quality, especially groundwater quality, can result in localized affects and sometimes basin-wide affects (Attachment A). Additionally, a reality is that some of these activities have not been regulated by regional water boards and some may not be within the regional water board's regulatory authority. A key piece of knowledge that is needed to make good decisions on how much degradation to allow, is information on the existing and planned beneficial uses of the water that could be affected. Such information is essential in evaluating whether potential impacts associated with a discharge of waste to groundwater are likely to be significant at either a local or basin-wide level.

2. Assimilative Capacity

The assimilative capacity of a surface water or groundwater is the ability of the water body to receive and accommodate natural and anthropogenic sources of pollutants (from point and nonpoint sources), while maintaining water quality standards that are protective of the beneficial uses of the water resource. For the purposes of this staff report the discussion of assimilative capacity will be focused exclusively on groundwater. Factors that affect the assimilative capacity of a groundwater basin depend on the contaminant, the soil type, and the groundwater chemistry and hydraulic parameters.

The Lahontan Region is characterized by broad alluvial valleys, high mountain peaks, and deep groundwater basins that are hydrologically isolated from the Pacific Ocean. These hydrologic conditions allow salts to accumulate in groundwater basins. In addition, existing point and non-point discharges already have taken up significant amounts of the assimilative capacity of the groundwater in some basins.

3. Regulatory Requirements

The Porter-Cologne Water Quality Control Act (California Water Code or CWC) sets forth factors each Regional Board must consider when adopting water quality objectives. These factors are listed in Section 13241 of the CWC and include:

- a. Past, present, and probable future beneficial uses of the water;
- b. Environmental characteristics of the hydrographic unit under consideration and its water quality;
- c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- d. Economic considerations;
- e. The need for developing housing within the region; and,
- f. The need to develop and use recycled water.

The Water Quality Control Plan for the Lahontan Region (Basin Plan) identifies the existing and potential beneficial uses associated with particular water bodies and establishes water quality objectives sufficiently stringent to protect the most sensitive beneficial uses. The Basin Plan is the basis for all of the Lahontan Water Board's regulatory activities. The Basin Plan contains an Implementation Chapter that identifies some specific activities and their associated water quality impacts and the control actions necessary to permit the activity while maintaining the established or future beneficial use of the groundwater.

There are 345 groundwater basins within the Lahontan Region. With the exception of groundwater below and surrounding Searles Lake bed, all of these groundwater basins are designated with the municipal beneficial use or MUN (see Table 2-2 of the Basin Plan). The MUN beneficial use is defined as municipal and domestic supply for community, military, or individual water supply systems including, but not limited to, drinking water supply.

In 1968 the State Water Board adopted Resolution No. 68-16 (Attachment B). Resolution No. 68-16 satisfies the Federal requirement that each state establish its own anti-degradation policy consistent with the Federal Anti-Degradation Policy outlined in 40 CFR, Section 131.12. While the Federal Anti-Degradation Policy addresses water quality of surface waters, Resolution No. 68-16 applies to both surface waters and groundwater. The basic policy directions of Resolution 68-16 are that whenever the existing quality of the water is better than the water quality objectives established in the Basin Plan, the existing high quality shall be maintained *"...until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water..."*. And the Resolution also states that *"...any activity ...which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."*

The Lahontan Water Board established a non-degradation objective in its Basin Plan. This objective requires that existing high quality waters be maintained unless an appropriate finding can be made under Resolution No. 68-16.

4. Consideration of Assimilative Capacity in Various Regional Board Control Actions

The Lahontan Water Board implements several different types of control actions to protect the beneficial uses of the groundwaters of the region. Activities that produce point source discharges to surface waters are regulated by either a National Pollution Discharge Elimination System (NPDES) permit under Section 402 of the Federal Clean Water Act or by waste discharge requirements (WDRs) under the California Porter Cologne Water Quality Control Act. Where the discharge is to land, the Regional Board prescribes waste restrictions in the form of WDRs. The Regional Board may also require implementation of best management practices to reduce nonpoint source discharges.

When adopting a control action to address a discharge to land, the Lahontan Water Board must consider how the activity will affect the water quality of the underlying groundwater basin where the activity will take place and its impact on the beneficial uses of the aquifer (Attachment C). The Lahontan Water Board needs to take into account the assimilative capacity of the groundwater when it is asked to prescribe or address:

- a. WDRs
- b. Groundwater cleanup levels
- c. Groundwater recharge projects
- d. Water reclamation projects

4.1 Waste Discharge Requirements

Any discharge of waste to land is subject to Lahontan Water Board regulation by the prescription of WDRs. In considering WDRs for a discharge, the Lahontan Water Board must ensure that the limitations it prescribes on a discharge provide the protection all of the beneficial uses of the groundwater water. It does so by requiring that the discharge does not violate any water quality objectives that are specified for the water body in the Basin Plan.

As stated earlier, Resolution No. 68-16 is to be applied in cases where the proposed discharge is anticipated to degrade water quality to some point above background but below water quality objectives. Resolution No. 68-16 does not restrict a water board from allowing a discharge of waste in these cases. Rather, it requires an analysis of the change in water quality to determine if the change is consistent with the maximum benefit to the people of the State while not unreasonably affecting present or future beneficial uses and not violating the Basin Plan. Resolution No. 68-16 requires that where some degradation of water quality (use of assimilative capacity) is to be allowed, that WDRs prescribed by the Board require "best practicable technology." That term is different than best "available technology", and is interpreted by Lahontan Water Board staff to mean that economics, which often affects a discharger's decision as to the degree to which it proposes to treat its wastewater prior to disposal are a part of the determination of what is practicable (capable of being put into effect).

The Water Board will routinely need to have some criteria to use when determining the amount of a receiving water's assimilative capacity to allocate to a specific discharge. Once allocated to an ongoing discharge from, say a municipal wastewater discharge, the assimilative capacity of the aquifer is no longer available to future discharges or for water banking. The California Water Code states that boards need not authorize the utilization of the full waste assimilation capacities of the receiving water (§13263(b) CWC). The problem, however, is that the water boards almost never know what the assimilative capacity of the groundwater actually is for non-toxic waste constituents commonly found in treated sewage (e.g., nitrates or total dissolved solids (TDS)). And the analysis of the affect of a long term discharge on an entire groundwater basin is not something rudimentary.

4.2 Groundwater Cleanup

When a discharge of waste, permitted or not, causes a pollution, the Lahontan Water Board has the authority section 13304 of the CWC) to require the discharger to cleanup and abate the effects of the discharge. In 1992 the State Water Board adopted a policy outlining the process that dischargers are expected to follow to fully evaluate the extent of the impact to water quality and to determine the nature of the cleanup action. In that policy, the State Water Board references Resolution No. 68-16 as setting forth the policy on establishing the cleanup standard. The goal of cleanup is to return the quality of the affected water body to that which existed

prior to the discharge (background water quality). However, as with decisions on permitting discharges of waste, the Lahontan Water Board has the discretion of establishing a cleanup standard that is higher than background water quality so long as beneficial uses of the water body are fully protected.

Decisions on cleanup standards should be made based on a complete evaluation of the extent of impact, an analysis of various alternatives to address the problem (feasibility, cost, time to achieve cleanup, level of cleanup achievable) and the potential use(s) of the water body during the cleanup process and into the future. While each decision is specific to the facts of the individual case, there are some overarching concepts. One concept is that there may be practical limits to cleanup in some situations. A second is that cost alone should not be a deterrent to practical cleanup. A third is that it may be more important to require rapid cleanup of pollutants in a water body where actual beneficial uses are impacted than in a situation where probable uses are many years in the future or not contemplated.

4.3 Other Nondegradation Considerations

Recent demand on groundwater supplies in the Lahontan Region has prompted water management and wastewater management agencies to pursue water conservation, conjunctive use strategies (groundwater recharge) and wastewater recycling projects to lessen the demand on groundwater resources. Water quality of the groundwater in closed basins can be affected by these strategies whether it is from an increase in salts to wastewater treatment plants from water conservation measures, the importation of salts in State Water Project water to groundwater basins via recharge, or from the discharge of salts during the application of recycled wastewater. While it is unlikely that these projects will cause pollution of groundwater (their primary purpose is to increase the supply of usable groundwater), their impact on groundwater quality must be considered by the Lahontan Water Board when it makes waste discharge and cleanup decisions that may use some of the assimilative capacity of a groundwater basin.

4.3.1. Groundwater Recharge

Groundwater recharge is a water management technique whereby surface water is transferred to groundwater basins for storage during periods of low water demand to supplement groundwater during periods of high demand. A total of approximately 250,000 acre-feet [question – is this all for gw recharge or is some for direct use either muni or ag?] is contracted annually from the SWP to five water agencies in the southern Lahontan Region.

Groundwater recharge projects import salt into hydrologically closed basins. Over time, this mass of salt will contribute to increases in the TDS of the basin, both localized (in the vicinity of the recharge activity) and potentially more wide-spread. The analysis of these effects should be part of any water

resource planning effort. This analysis would provide information the Lahontan Water Board could use in weighing the impacts and benefit of these projects. More importantly, these water resource planning efforts will assist the Lahontan Water Board in understanding the demands placed on the assimilative capacity of a groundwater basin from these activities when it makes decisions on allowing degradation associated with traditional waste discharges or site cleanup.

4.3.2. Water Reclamation Projects

Water reclamation projects are a necessary component in regional water management strategies to ensure the availability of water supplies over the long term. In the interest of promoting increased reclamation, the California legislature declared that:

"It is hereby declared that the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state." (CWC Section 13510)

The State Water Resources Control Board encourages water recycling and states in Resolution No. 77-1, "Policy with Respect to Water Reclamation in California", that:

"The State Board and the Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects....which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems" and,

"The State Board and the Regional Boards shall (1) encourage reclamation and reuse of water in water-short areas of the State, (2) encourage water conservation measures which further extend the water resources of the State..."

Moreover, the California legislature also wanted to ensure that salinity would not be a sole factor in whether a Regional Board adopts reclamation requirements when it said in Section 13523.5 of the CWC that:

"A regional board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in the basin plan."

The Lahontan Water Board must comply with both Resolution No. 77-1 and Resolution No. 68-16 when adopting water reclamation requirements. Water reclamation project proponents must evaluate the overall degradation to water quality from the project and demonstrate its benefit to the public thereby providing the necessary information to allow the Lahontan Water Board to fulfill its mandate to comply with these policies.

5. Determining Assimilative Capacity

5.1 Groundwater Modeling

Due to the variability of subsurface hydrogeology from site to site, modeling is the only way to estimate with any degree of accuracy what affect a discharge will have on groundwater quality. Groundwater basins are not simple "complete mixed bathtubs" where contaminant concentrations can be determined by calculating the resultant concentration from diluting a certain volume of contaminant in a volume of water. Groundwater modeling provides valuable estimates of how extensive a zone of degradation will extend over time and what the concentrations of constituents will be at various distances from the discharge location. Whereas years ago modeling was thought to be an expensive task done only by specialists, today it has become common place. Modeling the effect of a discharge is the only tool that the Lahontan Water Board has to support its decision making process and should be a component of a discharge application.

5.2 Characterize Groundwater Basins

While it would be extremely useful to completely understand the character and stressors associated with every groundwater basin, the water boards do not have the resources to accomplish this task. Development of long term protection strategies and the implementation of them must include the involvement of those most affected by the activity and control action. Water Board staff intend to work collaboratively with local and regional water management agencies on a regular basis to develop information to support a groundwater quality protection strategy.

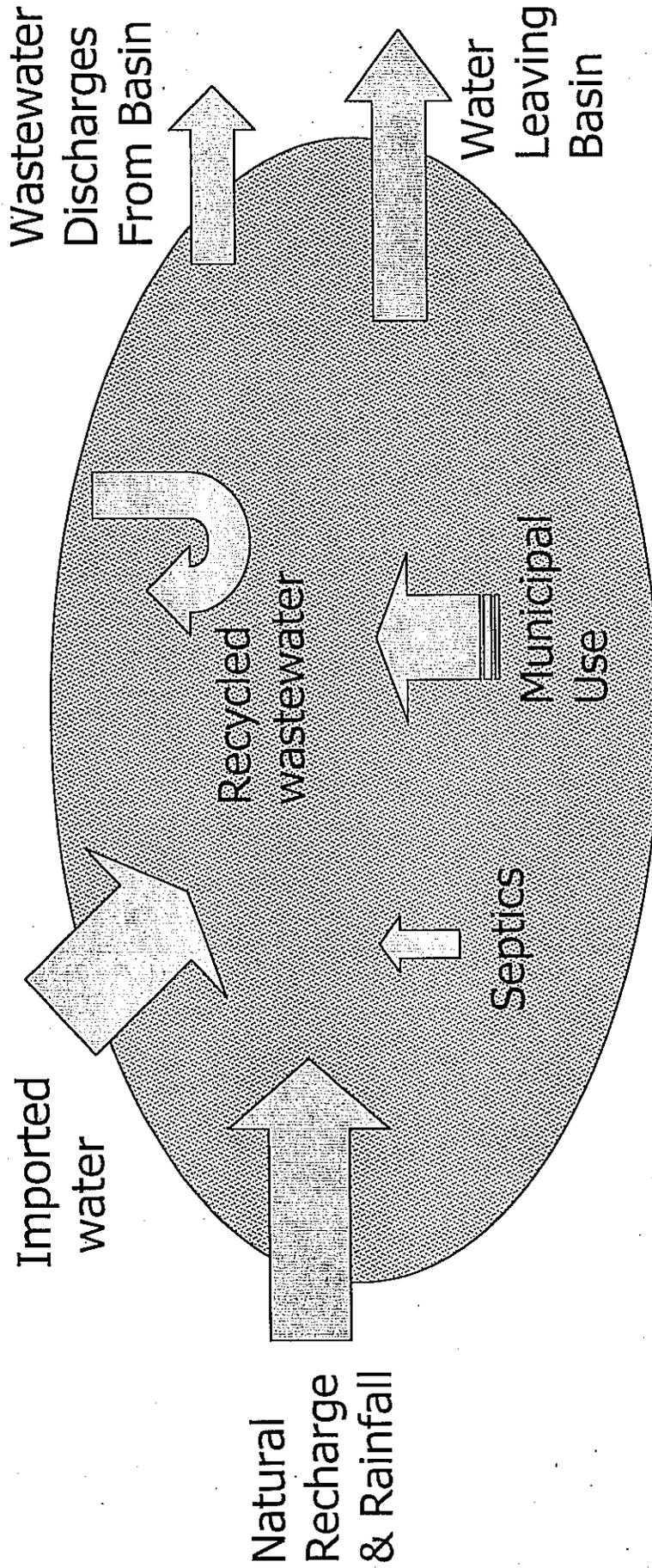
Important components if this information include: baseline concentrations of the constituents of most concern (TDS, nitrates), quantification of current and possible sources of these constituents (discharges, imported water), and analysis of the groundwater basin's ability to assimilate these constituents over the long-term. The long term plans for both the use of current groundwater supplies as well as the augmentation of groundwater supplies via importation of State Water Project water must be clearly understood to develop an effective strategy for water quality maintenance. Similarly, local planning agencies, that are continuously asked to approve of new land uses or specific projects, that may result in waste discharges that contain nitrates and other salts, must be a partner in any groundwater protection plans.

Attachment A - Basin Activities

Attachment B - Protection of High Quality Waters

Attachment C - Resolution No. 68-16

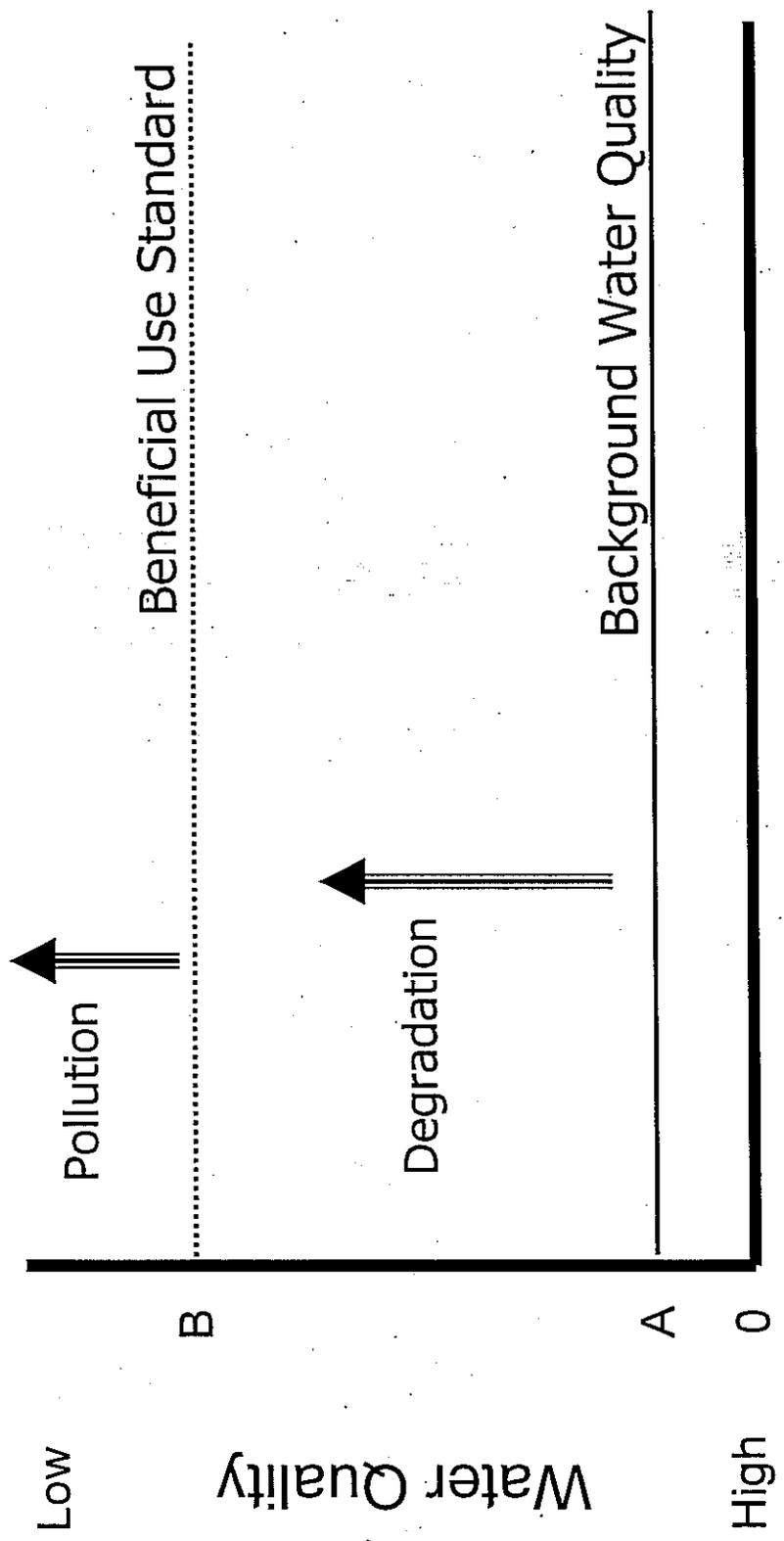
Basin Activities



Attachment A - Basin Activities

07-0011

Protection of High Quality Waters



Attachment B - Protection of High Quality Waters

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO
MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.
2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

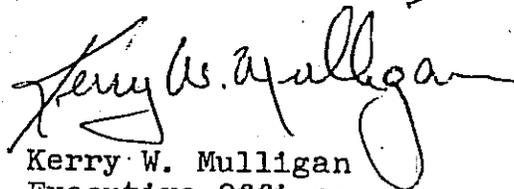
07-0013

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968



Kerry W. Mulligan
Executive Officer
State Water Resources
Control Board