STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF JANUARY 31 - FEBRUARY 1, 2013
Prepared on December 19, 2012

ITEM NUMBER: **17**

SUBJECT: **Rescission of Waste Discharge Requirements for Monterey Wine Company (Order No. R3-2002-0058) and enrollment in the *General Waste Discharge Requirements for Discharges of Winery Waste* (Order No. R3-2008-0018)**

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KEY INFORMATION

Discharger:	Monterey Wine Company
Location:	1010 Industrial Way, King City, Monterey County
Discharge Type:	Winery
Treatment:	Settling and aeration in ponds
Disposal:	Irrigation/dust control in vineyards, pasture irrigation, solids composted for vineyard use
Existing Order:	Individual WDR Order No. R3-2002-0058
This Action:	**Rescind Individual Order and enroll in Region-wide General Order**

SUMMARY
In 2002, just before the Water Board adopted its general waste discharge requirements for wineries, the Water Board imposed individual waste discharge requirements on the Monterey Wine Company (formerly named Monterey Pacific). In keeping with the Water Board's practice of shifting facilities to general waste discharge requirements, staff is proposing that the Monterey Wine Company discharge be enrolled under the General Winery Order concurrent with rescission of individual waste discharge requirements Order No. R3-2002-0058.

Staff proposed the enrollment/rescission as a consent item for the December 2012 Water Board meeting. At that meeting, an interested party raised last-instant compliance history concerns; monitoring reports show effluent limit violations. In response, the Water Board postponed its decision on the matter and directed staff to bring the matter back with a discussion about the facility's compliance history. Staff determined that, technically, while there have been violations:

- The violations result from inappropriate limits that are inconsistent with limits imposed on similar facilities.
- The violations are unlikely to have caused water quality impacts because of the mitigating effects of discharging to a large vineyard.

- The facility's current waste discharge requirements are unduly burdensome on the discharger.

- The discharge is a relatively low priority threat to water quality.

Staff continues to recommend:

1. Enrolling the discharge under the General Winery Order (Order No. R3-2008-0018).

2. Concurrently rescinding individual waste discharge requirements Order No. R3-2002-0058.

DISCUSSION

The Monterey Wine Company is located at 1010 Industrial Way, King City, Monterey County. The custom crush facility receives, stores, and processes grapes into wine. They have capacity for over 13,000 tons of crush and 250,000 cases of bottling. The winery process wastewater system includes screening, settling, and biological oxidation in lined ponds. Treated wastewater is recycled for vineyard and pasture irrigation. Solids removed from the wastewater are composted for vineyard use. Sanitary sewer waste from the offices and facility restrooms are discharged to the King City sanitary sewer system. No onsite treatment or disposal of sanitary waste occurs.

In June 2002, the Water Board adopted Order No. R3-2002-0058 imposing individual waste discharge requirements (WDRs) on the Monterey Wine Company (formerly named Monterey Pacific). In November 2008, the Water Board adopted Order No. R3-2008-0018, establishing general WDRs for wineries. It was the Water Board's intent to eventually regulate all wineries under general WDRs. New wineries were to be enrolled under the general WDRs. Existing winery WDRs, once they reached maturity and required review, were to be rescinded in favor of general WDR enrollment. The Monterey Wine Company WDRs are one of the few remaining individual winery WDRs and are scheduled for review.

The Water Board uses the General Winery Order to streamline permitting and provide consistency. Staff reviewed the Discharger's file and determined that the Monterey Wine Company's winery process wastewater discharge meets the conditions for enrollment under General Winery Order. Rather than revise the existing order, staff recommends the Discharger be regulated by General Winery Order.

The General Winery Order implements applicable Water Board prohibitions, discharge specifications, management practices, and provisions to protect water quality. When the discharge is regulated by the General Winery Order, the individual Waste Discharge Requirements will not be necessary, and, therefore, Water Board staff recommends that the Water Board rescind Order No. R3-2002-0058 (attached).

COMPLIANCE HISTORY

The discharger has dutifully submitted monitoring reports and expresses a conscientious attitude. Nonetheless, the monitoring reports show effluent violations for

- Flow
- BOD
- pH
- TDS
- Sodium
- Chloride

While there have been violations, staff believes that the violations do not represent a significant threat to water quality. The violations will be described in detail below.

Flow

In its initial operating years, the winery's flows stayed within the flow limit of 52,850 gallons per day (30-day average). Year-to-year, flow increased as production increased. Starting about five years ago, flows routinely violated the flow limit during the "crush," when grapes are harvested and winemaking activity is at its peak. The last five years of crush flows peaked as follows:

Crush Year	30-Day Average Flow (gallons per day)
2012	90,000
2011	61,000
2010	52,500
2009	80,000
2008	61,000

Although Monterey Wine Company reported flow violations during the 2011 and 2012 crushes, Monterey Wine Company did not discharge. Instead, Monterey Wine Company reported flows that were filling up an empty treatment pond; not flows from the treatment pond. Leading up to October 2011, Monterey Wine Company had pumped their treatment pond down to remove accumulated solids. In October 2011 the empty pond was capable of storing up to 1.68 million gallons.

The winery did violate flow limits during some crush seasons prior to the 2011 crush. Those flow violations resulted in actual effluent flow exceedences because they resulted in a corresponding discharge from the treatment pond. To avoid that condition, the Monterey Wine Company will implement a new protocol whereby the treatment pond will be drawn down prior to the crush, so that the treatment pond has some flow equalization/surge capacity.

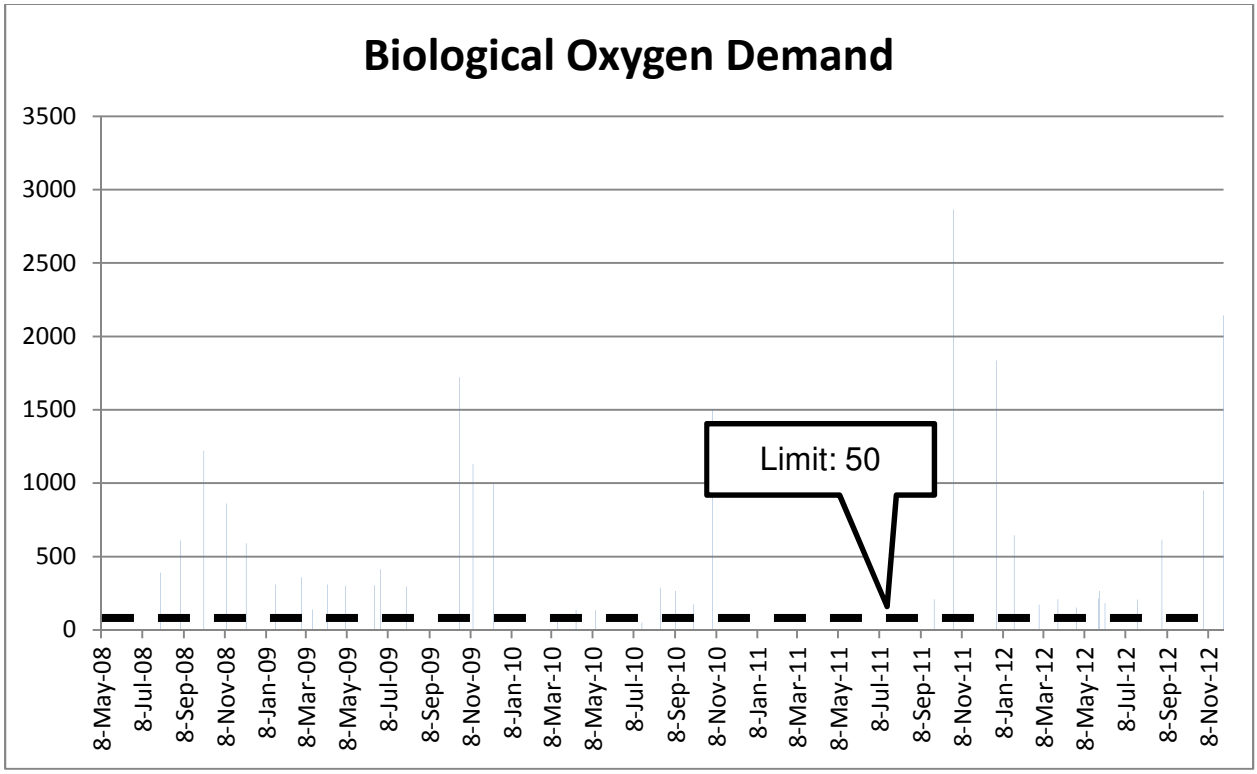
Too much flow risks pond overflows. Although Monterey Wine Company flows sometimes exceeded the flow limit, the data shows that the treatment pond maintained at least two feet of freeboard at all times - as required by the WDRs. So, pond overflows did not occur. The Monterey Wine Company's treatment pond is capable of processing flows above and beyond the current flow limit without resulting in pond overflows. Although the discharger has a compliance history of repeated flow violations, for reasons cited above, the historic flow violations should not hinder the regulatory transfer from individual WDRs to the *Winery General WDRs*; the high flows do not cause overflows.

However, increased flows decrease treatment pond detention time. Decreased pond detention time potentially reduces the pond's physical and biological treatment capacity. Reduced treatment capacity would express itself as elevated BOD, which leads to a discussion of BOD violations.

BOD

The Monterey Wine Company's WDRs have a 30-day average effluent BOD limit of 50 mg/L. That limit is not much higher than the 30 mg/L limit normally applied to discharges of sanitary wastewater to surface waters. However, the winery does not discharge to a surface water; the winery blends (i.e., dilutes) the effluent with irrigation water and irrigates a vineyard. Any BOD in the winery's effluent gets applied to vineyard soils, where soil bacteria can further consume it.

Monitoring data shows frequent effluent BOD violations. The last five years of effluent BOD values were reported as follows:



With a 30-day average BOD limit of 50 mg/L, there have been many BOD violations. However, the BOD violations are unlikely to cause detectable water quality impacts because the winery blends (i.e., dilutes) the effluent with irrigation water, then irrigates a large vineyard (more than 1,000 acres). In essence, grapes that were removed from the vineyard are being returned to the vineyard, minus their juice. The discharge is primarily winemaking equipment washwater, which includes some cleaning and sanitizing chemicals, and grape pomace (seeds, skins, stems, and settled solids).

The Monterey Wine Company's 50 mg/L BOD limit is much stricter than the *Winery General WDRs'* BOD limit, which reads as follows:

> C.9 *To prevent odor nuisance and impacts to groundwater where raw winery wastewater is discharged to land surface, organic loading rate should not exceed a 30-day average of 100 pounds of Biochemical Oxygen Demand (BOD_5) per acre per day.*

The *Winery General WDRs* recognize that raw winery wastewater may be safely discharged to land surface, as long as it does not overwhelm the capacity of the soil's aerobic bacteria. Calculating the Monterey Wine Company's organic loading rate using Monterey Wine Company's all-time highest reported effluent BOD (3,000 mg/L), flow rate (90,000 gpd), and vineyard acreage (>1,000 acres); results in an organic loading rate of less than 1 pound of BOD per acre per day. That is, worst case, Monterey Wine Company's organic loading rate is two orders of magnitude lower than that allowed under the *Winery General WDRs.* While the

Monterey Wine Company may have technically violated its effluent BOD limit, it is highly unlikely that a water quality impact occurred.

pH

pH is a measure of the number of hydrogen ions (H+) present in a solution. More commonly, it is a measure of alkalinity and acidity. The pH scale runs from 0 to 14, with seven being neutral. As pH goes to zero, the soil or solution becomes more acidic. As pH goes to 14, the soil or solution becomes more alkaline, or "basic."

Monterey Wine Company recycles treated wastewater to vineyards northeast of the winery. The 1,000+ acre vineyard is in the Monterey Appellation, which spans the entire Salinas Valley. Soils in the Monterey Appellation vary. The soils supporting the Monterey Wine Company's vineyard/water recycling area also vary, as seen in the map below.

The vineyard's various soils exhibit relatively neutral pH values and have a tremendous buffering capacity, although many factors can affect soil pH; rainfall, irrigation, soil conditioning, root growth, and decay of organic matter by soil microorganisms.

The *Winery General WDRs'* pH limit reads as follows:

> C.8. *Where the disposal area's soil buffering capacity may be insufficient, winery wastewater pH should be neutralized to between 6.0 and 8.5 prior to disposal/reuse. Otherwise, disposal area soils and/or groundwater monitoring may be required.*

The *Winery General WDRs* recognize that acidic or basic winery wastewater may be safely discharged to land surface, as long as it does not overwhelm the soil's buffering capacity. The

Monterey Wine Company's current pH limit ($6.5 \geq pH \geq 8.3$) requires neutral pH prior to vineyard irrigation. The current pH limit does not factor in the vineyard soils' pH buffering capacity. If the Water Board's objective is to protect groundwater from the discharge, the pH of the water entering the groundwater should be the ultimate compliance point, not the pH of the water in the treatment pond or, for that matter, the pH in the downstream irrigation pond that holds treated winery wastewater that is blended/diluted with well water before it is used for irrigation. The pH of the water before it is applied to the vineyard can vary with time of year, time of day, waste strength, and sampling location.

Successful treatment ponds' pH naturally fluctuates due to the presence of algae and bacteria in the aerobic and facultative zones. In sunlight, the algal cells utilize carbon dioxide from the water and release oxygen during photosynthesis. Organic–consuming bacteria breathe that oxygen and produce carbon dioxide, which supply the algal cells with their desired source of oxygen. On warm, sunny days, photosynthetic activity elevates oxygen concentrations in the surface water. Sometimes oxygen levels can rise above oxygen saturation levels. Conversely, oxygen levels are decreased at night, when photosynthesis decreases. Due to the intense use of carbon dioxide by algae, the pH of the near surface water can become elevated, creating conditions favorable for ammonia removal via volatilization. This photosynthetic activity occurs on a diurnal basis, causing both oxygen and pH levels to shift from a maximum in daylight hours to a minimum at night.

Understanding that successful facultative ponds' pH naturally fluctuates, it is unrealistic to think that a pond effluent will be relatively neutral. To obtain a neutral treatment process effluent, one would need to add a neutralization unit process. That would add costs and is not typically done. In addition, if one were to neutralize effluent, there is no guarantee that a neutral pH would reach the receiving water (i.e., groundwater). As mentioned earlier, water pH can change during the recycling/disposal process.

This Water Board has a long-standing practice of establishing pH effluent limits for discharges to land. In both surface water and land discharges, the important consideration is the discharge's impact on the receiving water. However, while effluent pH limits are critical for protecting surface water, they are not so critical for protecting groundwater. As mentioned earlier, wastewater effluent pH is not necessarily equal to the pH of percolated wastewater. So, controlling effluent pH for land discharges may be irrelevant with respect to protecting groundwater. The treatment pond pH is not indicative of the pH of the percolated water that enters ground water. It is unlikely that the pH violations have resulted in measureable water quality impacts. We do not see supply wells taken out of service due to pH degradation. Although the discharger has a compliance history of repeated pH violations, for reasons cited above, the historic pH violations should not hinder the regulatory transfer from individual WDRs to the *Winery General WDRs*.

Salts: Total Dissolved Solids, Sodium, and Chloride

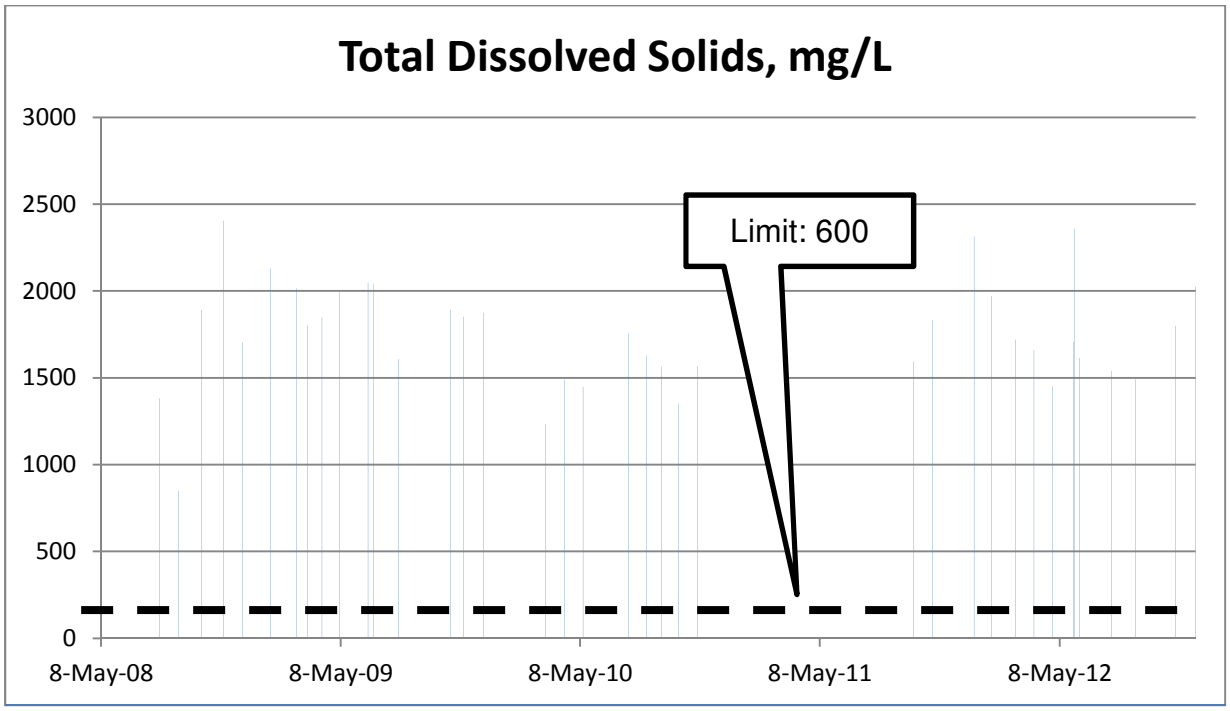
The Monterey Wine Company's WDRs have Total Dissolved Solids (TDS), sodium (Na), and chloride (Cl) limits as follows:

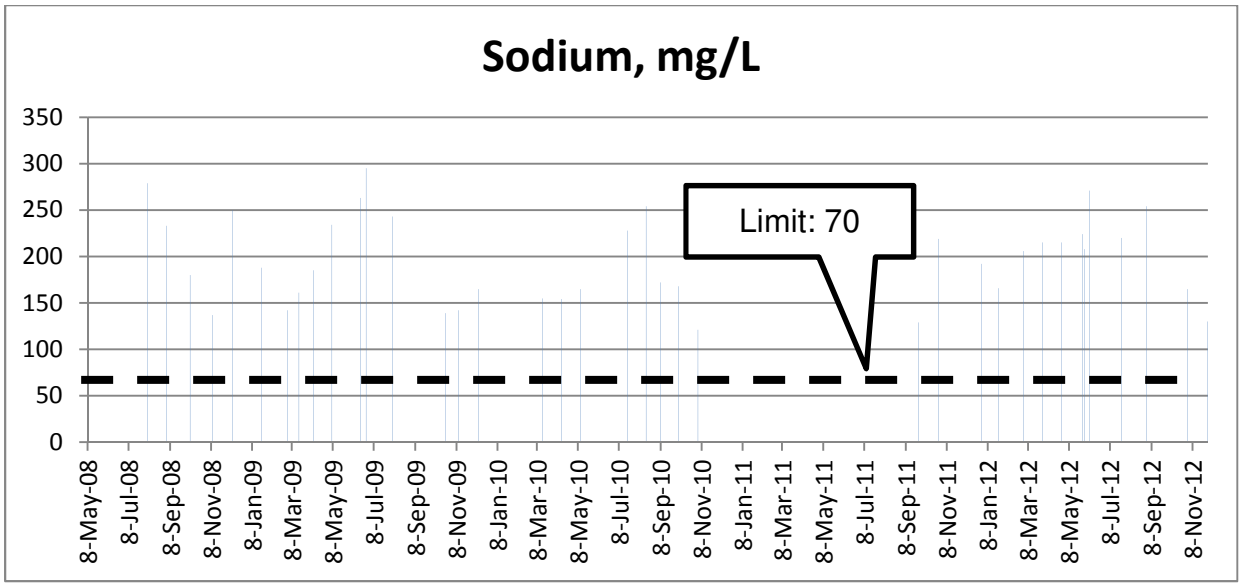
Constituent/Parameter	Units	30-Day Average
Total Dissolved Solids	mg/L	600 [BP]
Sodium	mg/L	70 [BP]
Chloride	mg/L	150 [BP]

Constituent/Parameter	Units	30-Day Average
Sulfate	mg/L	150 [BP]

The limits directly impose our Basin Plan's *Table 3-8, Median Ground Water Objectives* for the Salinas River Sub-Basin, Upper Valley Sub-Area. There is technical flaw for imposing median basin baseline numbers as limits for all discharges over that basin. A median number is, by definition, the value of the middle number when all data values are ranked in numerical order. Half of the data points used to derive the median are above the median value. That is, if the baseline data represent natural background water quality, half of the natural water quality values exceed the median and will exceed the median that has been used as the limit. Using median baseline values as limits neglects the natural water quality variation in a basin. The Basin Plan did not intend for the values in its *Table 3-8* to be used as effluent limits at all times. The Basin Plan states that limits should be derived considering the water quality naturally present in the vicinity of the discharge. *This scope of this issue goes beyond this specific discharge. It pertains to the derivation of limits for all discharges. Staff is studying this matter in more depth and will make a more comprehensive presentation about the matter in the future.* For the time being, as staff is developing a more relevant approach to regulating salt discharges, staff has not been enforcing violations of salt eluent limits.

In the case of the Monterey Wine Company's discharge, monitoring data shows frequent effluent TDS and Na violations. Monterey Wine Company's discharge has not exceeded the Cl limit. The last five years of TDS and Na values were reported as follows:





TDS limits are intended to limit a discharge's mineral salts. However, the TDS analysis measures more than mineral salts; it also includes organic dissolved solids, such as sugars. Winery wastewater can include a high level of organic solids. So, a winery's effluent TDS value may not be an accurate indication of the discharged salts. A better indication of discharged salts come from the "fixed" dissolved solids analysis, although even that is a gross estimate. The fixed dissolved solids protocol involves "burning off" organic matter before measuring the residual solids. Over the last five years, the average fixed dissolved solids concentration is about double the TDS limit of 600 mg/L. But that may not result in measurable water quality impacts due to the inherent problems of the effluent limit (see above), the significant dilution with irrigation water, the short duration/seasonality of flows, and the assimilative capacity of the receiving groundwater. Generally speaking, winery wastewater is relatively low in added salts compared to sanitary wastewater discharges, which often include salts from water softening. It is likely that winery wastewater is relatively low in added salts compared to the widespread application of fertilizers throughout the Salinas Valley. Focusing on winery wastewater salts seems relatively unproductive considering the seemingly larger salt discharges occurring in the basin.

OTHER CONSIDERATIONS

Nitrogen

Although there have been no violations related to nitrogen limits, it is important to know that winery wastewater typically has very low nitrogen concentrations.

Pathogens

Unlike sanitary wastewater, winery wastewater does not pose a significant public health threat.

ENVIRONMENTAL SUMMARY

Waste discharge requirements for existing facilities are exempt from provisions of the California Environmental Quality Act (Public Resource Code, Section 21100 et seq.) in accordance with Section 15301, Chapter 3, Title 14 of the California Administrative Code.

COMMENTS

By letter dated July 3, 2012, Water Board staff notified the Discharger and known interested parties of its recommendation to rescind Waste Discharge Requirements Order No. R3-2002-0058 and approve enrollment of the Discharger under the General Winery Order. The results of our notification efforts are as follows:

John Silva, Owner Monterey Wine Company, LLC jsilva@silva-companies.com	No comments received
Jamie Meves, Director of Operations/Chief Winemaker Monterey Wine Company, LLC jamiem@montereywinecompany.com	No comments received
Richard LeWarne Monterey County Environmental Health Division Drinking Water Protection Services lewarner@co.monterey.ca.us	No comments received
Steve Shimek, Executive Director Monterey Coastkeeper steve@montereycoastkeeper.org	Written comments not submitted ahead of the Board hearing; however, comments concerning compliance history presented orally during the hearing. The "Compliance History" section of this staff report attempts to address the interested party's comments.

RECOMMENDATION

At the July 2011 off-site meeting, the Water Board and staff agreed upon the following high priorities:

- Threats to Human Health
- Degradation of Aquatic Habitat
- Degradation of Hydrologic Processes
- Seawater Intrusion
- Salt Degradation of Groundwater

In staff's opinion, this particular effort concerning Monterey Winery Company's recycling of winery wastewater to a vineyard does not fall into one of the above priority categories.

The Monterey Winery Company's recycling of winery wastewater to a vineyard is not unusual, as far as winery discharges go. Generally speaking, in staff's opinion, winery wastewater recycled to a vineyard poses a relatively low threat to water quality for the following reasons:

1. It contributes to the fulfillment of California's desire to maximize water recycling.
2. It is not pathogenic like sanitary wastewater.
3. It is low in salts and nutrients.

4. It is usually highly diluted with irrigation water.
5. Vineyard soils have a high capacity to treat the primary threat, BOD, as well as buffering capacity to neutralize pH.

At a future Board meeting, staff intends to present a more comprehensive assessment of winery discharges and their regulation to support the above opinion. Until that time, for this particular item, staff recommends that the Monterey Wine Company discharge be regulated consistently with other, similar discharges – which are regulated under the *General Winery WDRs*. Specifically, staff continues to recommend:

1. The rescission of Waste Discharge Requirements Order No. R3-2002-0058 and
2. The enrollment of the Monterey Wine Company's winery wastewater discharge under the General Waste Discharge Requirements for Discharges of Winery Waste, Order No. R3-2008-0018.

ATTACHMENT

Existing Order No. R3-2002-0058

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